

Startup Guide

# Keysight M9392A PXI Vector Signal Analyzer 50 MHz to 26.5 GHz

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M9392-90001

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## Safety Notices

### CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

### WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

The following safety precautions should be observed before using this product and any associated instrumentation.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the

safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product.

#### **WARNING**

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

The types of product users are:

- Responsible body is the individual or group responsible for the use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring operators are adequately trained.
- Operators use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument. They must be protected from electric shock and contact with hazardous live circuits.
- Maintenance personnel perform routine procedures on the product to keep it operating properly (for example, setting the line voltage or replacing consumable materials). Maintenance procedures are described in the user documentation. The procedures explicitly state if the operator may perform them. Otherwise, they should be performed only by service personnel.
- Service personnel are trained to work on live circuits, perform safe installations, and repair products. Only properly trained service personnel may perform installation and service procedures.

#### **WARNING**

Operator is responsible to maintain safe operating conditions. To ensure safe operating conditions, modules should not be operated beyond the full temperature range specified in the Environmental and physical specification. Exceeding safe operating conditions can result in shorter lifespans, improper module performance and user safety issues. When the modules are in use and

operation within the specified full temperature range is not maintained, module surface temperatures may exceed safe handling conditions which can cause discomfort or burns if touched. In the event of a module exceeding the full temperature range, always allow the module to cool before touching or removing modules from chassis.

Keysight products are designed for use with electrical signals that are rated Measurement Category I and Measurement Category II, as described in the International Electrotechnical Commission (IEC) Standard IEC 60664. Most measurement, control, and data I/O signals are Measurement Category I and must not be directly connected to mains voltage or to voltage sources with high transient over-voltages. Measurement Category II connections require protection for high transient over-voltages often associated with local AC mains connections. Assume all measurement, control, and data I/O connections are for connection to Category I sources unless otherwise marked or described in the user documentation.

Exercise extreme caution when a shock hazard is present. Lethal voltage may be present on cable connector jacks or test fixtures. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30V RMS, 42.4V peak, or 60VDC are present. A good safety practice is to expect that hazardous voltage is present in any unknown circuit before measuring.

Operators of this product must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000V, no conductive part of the circuit may be exposed.

Do not connect switching cards directly to unlimited power circuits. They are intended to be used with impedance-limited sources. NEVER connect switching cards directly to AC mains. When connecting sources to switching cards, install protective devices to limit fault current and voltage to the card.

Before operating an instrument, ensure that the line cord is connected to a properly-grounded power receptacle. Inspect the connecting cables, test leads, and jumpers for possible wear, cracks, or breaks before each use.

When installing equipment where access to the main power cord is restricted, such as rack mounting, a separate main input power disconnect device must be provided in close proximity to the equipment and within easy reach of the operator.

For maximum safety, do not touch the product, test cables, or any other instruments while power is applied to the circuit under test. ALWAYS remove power from the entire test system and discharge any capacitors before: connecting or disconnecting cables or jumpers, installing or removing switching cards, or making internal changes, such as installing or removing jumpers.

Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

The instrument and accessories must be used in accordance with its specifications and operating instructions, or the safety of the equipment may be impaired.

Do not exceed the maximum signal levels of the instruments and accessories, as defined in the specifications and operating information, and as shown on the instrument or test fixture panels, or switching card.

When fuses are used in a product, replace with the same type and rating

for continued protection against fire hazard.

Chassis connections must only be used as shield connections for measuring circuits, NOT as safety earth ground connections.

If you are using a test fixture, keep the lid closed while power is applied to the device under test. Safe operation requires the use of a lid interlock.

Instrumentation and accessories shall not be connected to humans.

Before performing any maintenance, disconnect the line cord and all test cables.

To maintain protection from electric shock and fire, replacement components in mains circuits – including the power transformer, test leads, and input jacks – must be purchased from Keysight. Standard fuses with applicable national safety approvals may be used if the rating and type are the same. Other components that are not safety-related may be purchased from other suppliers as long as they are equivalent to the original component (note that selected parts should be purchased only through Keysight to maintain accuracy and functionality of the product). If you are unsure about the applicability of a replacement component, call an Keysight office for information.

#### WARNING

**No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers. For continued protection against fire hazard, replace fuse with same type and rating.**

#### PRODUCT MARKINGS:



The CE mark is a registered trademark of the European Community.



Australian Communication and Media Authority mark to indicate regulatory compliance as a registered supplier.



This symbol indicates product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001). It also identifies the product is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).



South Korean Class A EMC Declaration. This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home. A 급 기기 (업무용 방송통신기자재) 이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.



This product complies with the WEEE Directive marketing requirement. The affixed product label (above) indicates that you must not discard this electrical/electronic product in domestic household waste. **Product Category:** With reference to the equipment types in the WEEE directive Annex 1, this product is classified as “Monitoring and Control instrumentation” product. Do not dispose in domestic household waste. To return unwanted products, contact your local Keysight office, or for more information see

<http://about.keysight.com/en/companyinfo/environment/takeback.shtml>.



This symbol indicates the instrument is sensitive to electrostatic discharge (ESD). ESD can damage the highly sensitive components in your instrument. ESD damage is most likely to occur as the module is being installed or when cables are connected or disconnected. Protect the circuits from ESD damage by wearing a grounding strap that provides a high resistance path to ground. Alternatively, ground yourself to discharge any built-up static charge by touching the outer shell of any grounded instrument chassis before touching the port connectors.



This symbol on an instrument means caution, risk of danger. You should refer to the operating instructions located in the user documentation in all cases where the symbol is marked on the instrument.



This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.

#### CLEANING PRECAUTIONS:

#### WARNING

To prevent electrical shock, disconnect the Keysight Technologies instrument from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally. To clean the connectors, use alcohol in a well-ventilated area. Allow all residual alcohol moisture to evaporate, and the fumes to dissipate prior to energizing the instrument.

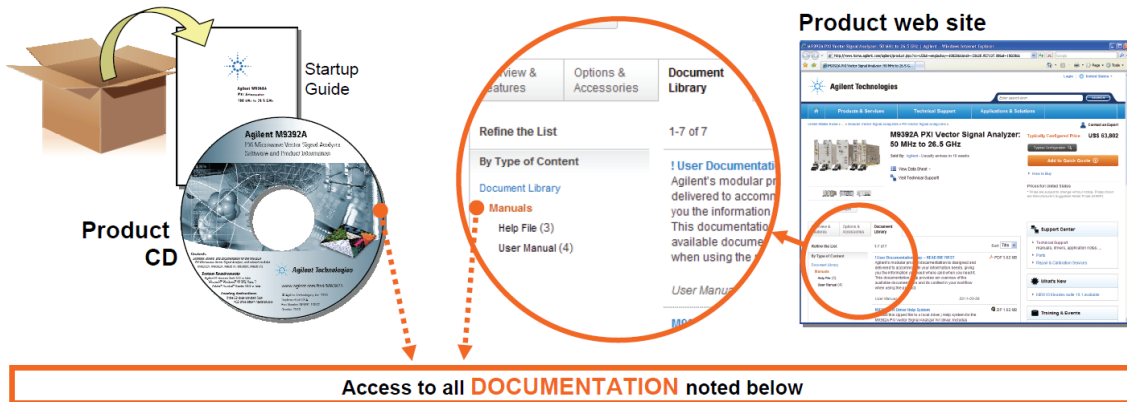
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# Documentation Map



## Startup Guide



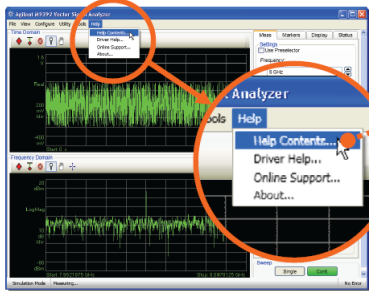
- Unpack product
- Verify shipment
- Install software
- Install hardware
- Verify operation
- Troubleshooting

## Data Sheet

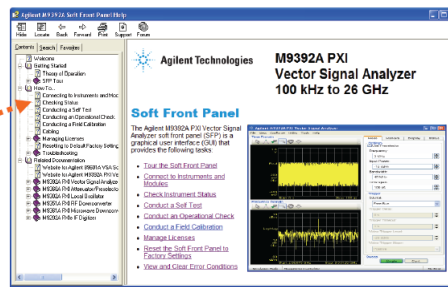


- Product description
- Technical specifications

## Soft Front Panel (SFP) user interface

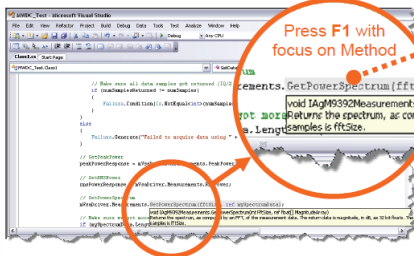


## SFP help system



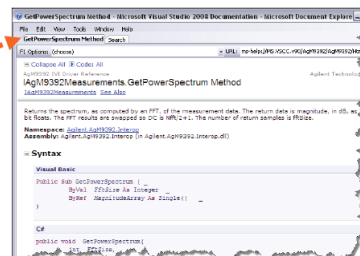
- Theory of operation
- Block diagram
- Configuration
- Self test
- Operational check
- Field calibration
- Troubleshooting

## Visual Studio



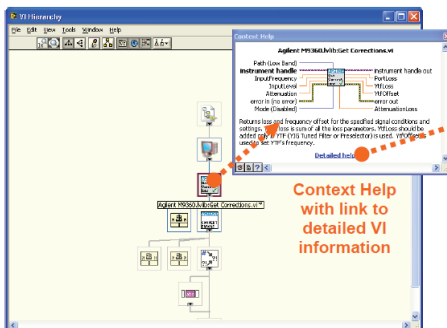
Press F1 with focus on Method

## IVI Driver help system



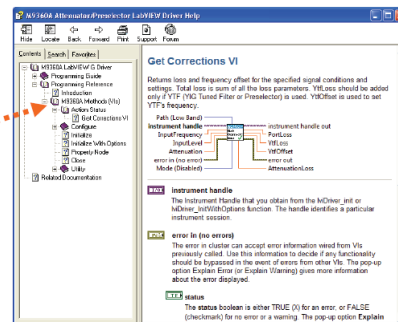
- IVI-COM and IVI-C driver programmer's reference
- Sample programs

## LabVIEW



Context Help with link to detailed VI information

## LabVIEW Driver help system



- LabVIEW driver programmer's reference
- Sample programs



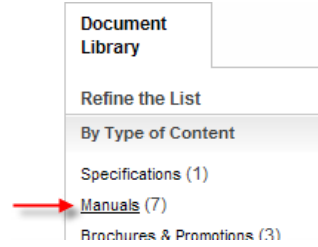
# M9392A Introduction

The scope of this Startup Guide is to detail the processes of receiving and installing the modules and cables that comprise the Agilent M9392A PXI Vector Signal Analyzer. Additionally, installing the required software, and performing a Field Calibration are documented. Troubleshooting is included to assist you in determining and specifying any failures. If you have any questions after reviewing this information, please contact your local Agilent Technologies Inc. representative or contact us through our website at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A).

## Related Documentation

This Startup Guide and the documentation listed below are on the CD and at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A) (go to **Document Library > Manuals**).

- M9392A Soft Front Panel help system
- M9392A device driver API help systems (IVI-C/IVI-COM and LabVIEW)
- M9392A specifications (Data Sheet)
- M9392A Streaming DataViewer help system



## Follow the Startup Sequence

**WARNING** Closely follow the startup process flow in this document. Deviating from the sequence can cause unpredictable system behavior, damage your system, and may cause personal injury.

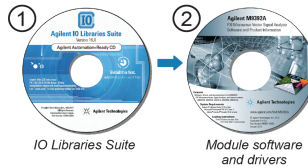
### Step 1: Unpack and Inspect



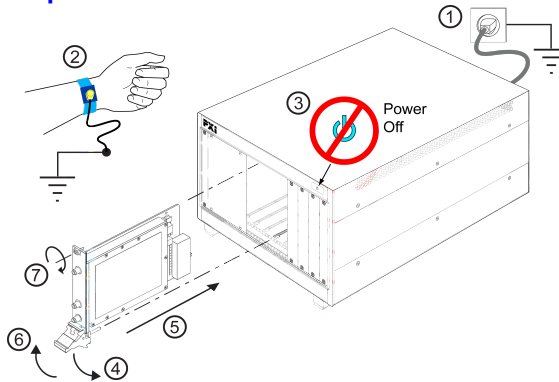
### Step 2: Verify Shipment



### Step 3: Install Drivers and Software



### Step 4: Install Modules



### Step 5: Verify Operation with the Soft Front Panel (SFP)

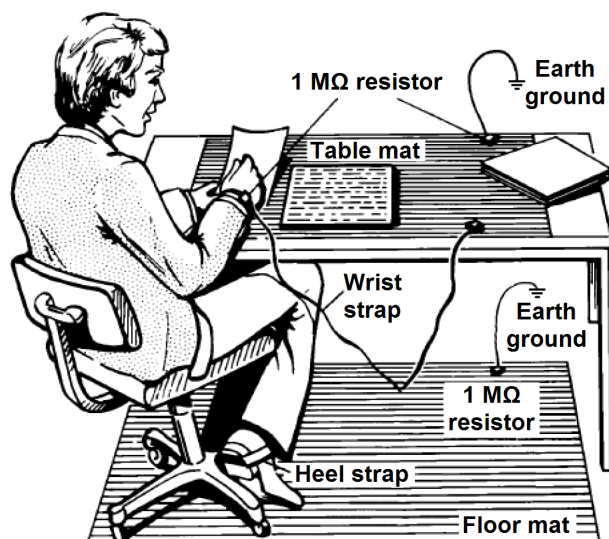
**Step 6: INSTALLATION PROCESS COMPLETE.**  
Proceed to program your product through the API.

## Step 1: Unpack and Inspect the Modules

**CAUTION**

The modules are shipped in materials which prevent damage from static. The modules should only be removed from the packaging in an anti-static area ensuring that correct anti-static precautions are taken. Store all modules in anti-static envelopes when not in use.

### ESD



Electrostatic discharge (ESD) can damage or destroy electronic components. Use a static-safe work station to perform all work on electronic assemblies. The figure (left) shows a static-safe work station using two types of ESD protection: conductive table-mat and wrist-strap combination, and conductive floor-mat and heel-strap combination. Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 MΩ of isolation from ground.

**WARNING**

**DO NOT** use these techniques for a static-safe work station when working on circuitry with a voltage potential greater than 500 volts.

### Inspect for Damage

After unpacking a module, inspect it for any shipping damage. Report any damage to the shipping agent immediately, as such damage is not covered by the warranty (see warranty information at beginning of this document).

**CAUTION**

To avoid damage when handling a module, do not touch exposed connector pins.

**NOTE**

See [www.agilent.com/find/tips](http://www.agilent.com/find/tips) for information on preventing damage to your Agilent equipment.

### Return a Module for Service

Should it become necessary to return for repair or service, follow the steps below:

1. Review the warranty information shipped with your product.
2. Contact Agilent to obtain a Return Material Authorization (RMA) and return address. For assistance finding Agilent contact information, go to [www.agilent.com/find/assist](http://www.agilent.com/find/assist) (worldwide contact information for repair and service) or refer to the “Support” information on the product web page at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A).
3. Write the following information on a tag and attach it to the malfunctioning equipment:
  - Name and address of owner. A P.O. box is not acceptable as a return address.
  - Module serial number(s). The serial number label is located on the side panel of the module. The serial number can also be read from the Soft Front Panel interface – after the hardware is installed.
  - Description of failure or service required.

## Step 2: Verify M9392A Shipment Contents

4. Pack the module in its original ESD bag and packing carton. If the original carton is not available, use bubble wrap or packing peanuts and place the instrument in a sealed container and mark the container “FRAGILE”.
5. On the shipping label, write ATTENTION REPAIR DEPARTMENT and the RMA number.

**NOTE**

If any correspondence is required, refer to the product by serial number and model number.

## Step 2: Verify M9392A Shipment Contents

The Agilent M9392A PXI Vector Signal Analyzer is a collection of modules, housed in a PXIe chassis. The minimum Vector Signal Analyzer consists of the software, chassis, an Agilent M9202A PXIe IF Digitizer, an Agilent M9302A PXI Local Oscillator and either an Agilent M9351A PXI Downconverter or an Agilent M9361A PXI Downconverter. Your configuration may include both downconverters plus an Agilent M9360A PXI Attenuator/Preselector. Thus, the shipment contents are dependent upon your choice of modules.

### Items included in your M9392A Shipment

Ships with Module	Qty	Agilent Part Number	Description
	1	M9392-10002	Agilent M9392A PXI Vector Signal Analyzer Software and Product Information CD, contains: Soft Front Panels, drivers, and all printed documentation in PDF format
	1	E2094-60003	Agilent IO Libraries Suite CD
	1	M9392-90001	Agilent M9392A PXI Vector Signal Analyzer Startup Guide in hard copy
M9202A	1	9320-6741	China RoHS Addendum for Digitizer Products
	1	9320-6698	China RoHS Addendum for Vector Signal Analyzer
	1	5023-1450	Wrench, socket extension, 5/16 inch, SMA
	1	5002-3361	SMB/MMCX Cable Removal Tool
M9202A	1 *	M9202-90001	Agilent M9202A PXIe IF Digitizer Startup Guide in hard copy
M9302A	1 *	M9302-90001	Agilent M9302A PXI Local Oscillator Startup Guide in hard copy
M9351A	1 *	M9351-90001	Agilent M9351A PXI Downconverter Startup Guide in hard copy
M9360A	1 *	M9360-90001	Agilent M9360A PXI Attenuator/Preselector Startup Guide in hard copy
M9361A	1 *	M9361-90001	Agilent M9361A PXI Downconverter Startup Guide in hard copy
M9360A	1 *	M9360-20001	Cable, semi-rigid, Master LO
M9351A	1 *	M9351-20001	Cable, semi-rigid (SMA-SMA)
M9361A	1 *	M9361-20001	Cable, semi-rigid (SMA-SMA)
M9361A	1 *	M9361-20002	Cable, semi-rigid (SMA-SMA)
M9351A	1 *	M9351-20002	Cable, semi-rigid (SMA-SMA)
M9351A	1 *	8120-5016	Cable, coaxial, SMB-SMB (190 mm)
M9351A	1 *	8121-2072	Cable, coaxial, SMB-SMB (75 mm)
M9202A	1 *	8120-5531	Cable, SMB - SMA coaxial (190 mm)
M9202A	1 *	8121-2042	Cable, A06/A32 80G (SMB-MM CX)
M9202A	1 *	8121-2041	Cable, A06/A32 190G (SMB-MM CX)
M9202A	1 *	8121-2041	Cable, A06/A32 190G (SMB-MM CX)

\* Each module shipment includes a hard copy of its Startup Guide and appropriate cables.

**NOTE**

In addition to the items described in the preceding table, each module ships with a Certificate of Calibration and a recalibration letter.

**NOTE**

All files contained on the CD are available from at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A).

## Step 3: Install the Software

### System Requirements

Topic	Windows® 7 and Vista Requirements	Windows® XP Requirements
Operating system	Windows 7 (32 bit and 64 bit); Windows® Vista, SP1 and SP2 (32-bit and 64-bit) <sup>1</sup>	Window® XP, Service Pack 3 <sup>1</sup>
Processor speed	1 GHz 32-bit (x86), 1 GHz 64-bit (x64), no support for Itanium64	600 MHz or higher required 800 MHz recommended
Available memory	1 GB minimum <sup>2</sup>	256 MB minimum (1 GB or greater recommended)
Available disk space <sup>3</sup>	1.5 GB available hard disk space, includes: <ul style="list-style-type: none"> <li>• 1 GB available for Microsoft .NET Framework 3.5 SP1 <sup>4</sup></li> <li>• 100 MB for Agilent IO Libraries Suite</li> </ul>	
Video	Support for DirectX 9 graphics with 128 MB graphics memory recommended (Super VGA graphics is supported)	Super VGA (800x600) 256 colors or more
Browser	Microsoft® Internet Explorer 7.0 or greater	Microsoft® Internet Explorer 6.0 or greater

<sup>1</sup> Note: Not supported when using streaming options (M9202A-V05 or M9202A-V10).

<sup>2</sup> Note: 4 GB minimum required for streaming capability (M9202A-V05 or M9202A-V10), which requires Windows 7.

<sup>3</sup> Note: Because of the installation procedure, less disk space may be required for operation than is required for installation. The amount of space listed above is required for installation.

<sup>4</sup> Note: .NET Framework Runtime Components are installed by default with Windows 7 and Vista. Therefore, you may not need this amount of available disk space.

### Hardware Requirements

Topic	Requirements
Chassis	cPCI(J1), PXI-1, or PXIe hybrid chassis slot
Host controller	A PXI or PXI Express embedded controller or remote controller (external PC connected to the chassis by a PCI-to-PXI interface) is required.
Embedded controller	Agilent M9036A or an embedded controller that meets the following requirements: <ul style="list-style-type: none"> <li>• PXIe system controller (PXI-1 embedded controllers are not compatible)</li> <li>• Utilize a 2x8, 4x4, or 1x4 PXIe system slot link configuration.</li> <li>• Run one of the operating systems listed in System Requirements (above).</li> </ul>
Remote controller	(for Agilent M9018A chassis use only) Agilent M9021 Cable Interface x8 with one of the following PC interface options: <ul style="list-style-type: none"> <li>• Agilent <a href="#">M9045B</a> PCIe ExpressCard Adaptor x1, with cable (for a laptop PC)</li> <li>• Agilent <a href="#">M9048A</a> PCIe Desktop Adaptor x8, with cable (for desktop PCs)</li> </ul> Or an equivalent remote controller using a PC running one of the operating systems listed in System Requirements (above).

## Power up the Controller

### CAUTION

If you are using a remote controller and you have installed the interface cable, you must power up the chassis **BEFORE** you power up the PC. When you power down your chassis, Shut Down the PC **BEFORE** you power down the chassis.

If you are using an embedded controller, complete the following steps:

1. Install the embedded controller module into the compatible chassis. The Agilent M9036A PXIe Embedded Controller and Agilent M9018A PXIe Chassis are recommended. Please refer to the embedded controller and chassis documentation for further details.
2. Connect peripherals (mouse, keyboard, monitor).
3. Power up the chassis.

## Install the Software

The M9392A software is located on the Agilent M9392A PXI Vector Signal Analyzer Software and Product Information CD (M9392-10002) and the Agilent IO Libraries Suite CD (E2904-60003). The same software is also available for downloading at the Agilent website at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A).

The Agilent 89600 Vector Signal Analyzer Software is available for purchase from [www.agilent.com/find/vsa](http://www.agilent.com/find/vsa). This software allows you to measure the RF and modulation quality of digitally modulated signals.

This installation includes the following:

- Agilent IO Libraries Suite (IOLS), which includes the Agilent Connections Expert. This software must be installed first.
- If you wish to install the Agilent 89600 Vector Signal Analyzer Software, do so **AFTER** installing the IOLS and **BEFORE** installing the drivers located on the Agilent M9392A PXI Vector Signal Analyzer Software and Product Information CD. See "[Agilent 89600 Vector Signal Analysis Software](#)" on page [45](#).
- Soft Front Panel (SFP), device drivers (IVI-C, IVI-COM, and LabVIEW G) and documentation for all modules and for the M9392A Vector Signal Analyzer.

### NOTE

Each module has unique device drivers, soft front panel software and documentation. Performing the software installation offers the opportunity to install software components for one or more, of the available modules: Agilent M9202A, M9302A, M9351A, M9360A and M9361A. Notice in the figure that follows Step 5, the software components for the Agilent M9202A PXIe IF Digitizer are called "MD1 Digitizer Installation for M9202".

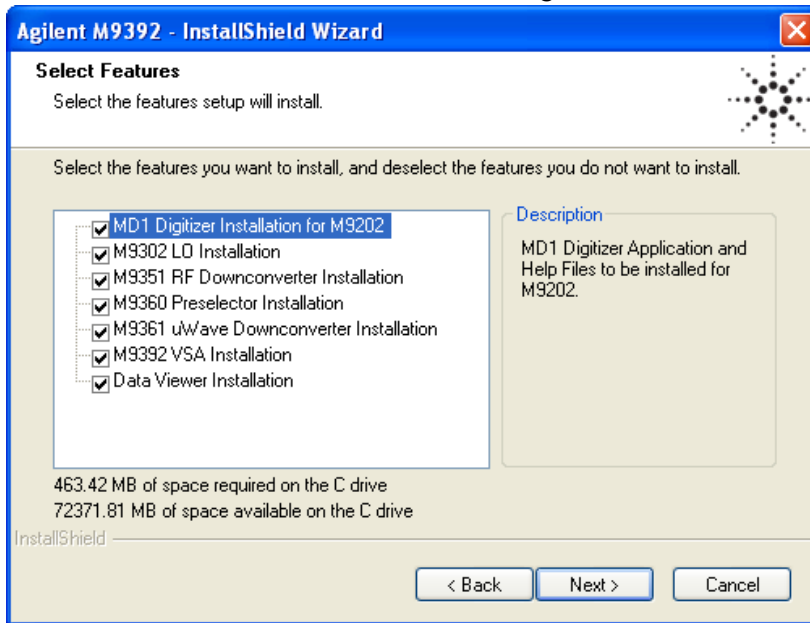
### NOTE

Version 16.3.16603.3 (or newer) of the Agilent IO Libraries Suite is required for Agilent M9392A PXI Vector Signal Analyzer operation.

## Software Installation Procedure

1. From the Agilent IOLS CD (E2904-60003) browser, launch the installer.
2. Follow the installer prompts to install the IO libraries.
3. If you choose to install the Agilent 89600 Vector Signal Analyzer Software, follow the prompts to complete the installation.
4. From the Agilent M9392A PXI Vector Signal Analyzer Software and Product Information CD (M9392-10002), launch the installer.

- Follow the installer prompts. Choose a "Complete" installation to install all software and documentation, or a "Custom" installation to select from a listing of modules and other features.



- After installation is complete, power down the host PC, and then the chassis if you are using a remote controller.

**CAUTION**

If you are using a remote controller, Shut Down the PC BEFORE you power down the chassis. When you restore power, power up the chassis BEFORE you power up the PC.

## Step 4: Install the Modules

**CAUTION**

PXI hardware does not support "hot-swap" (changing modules while power is applied to the chassis) capabilities. Before installing or removing a module to/from the chassis, power off the chassis to prevent damage to the module.

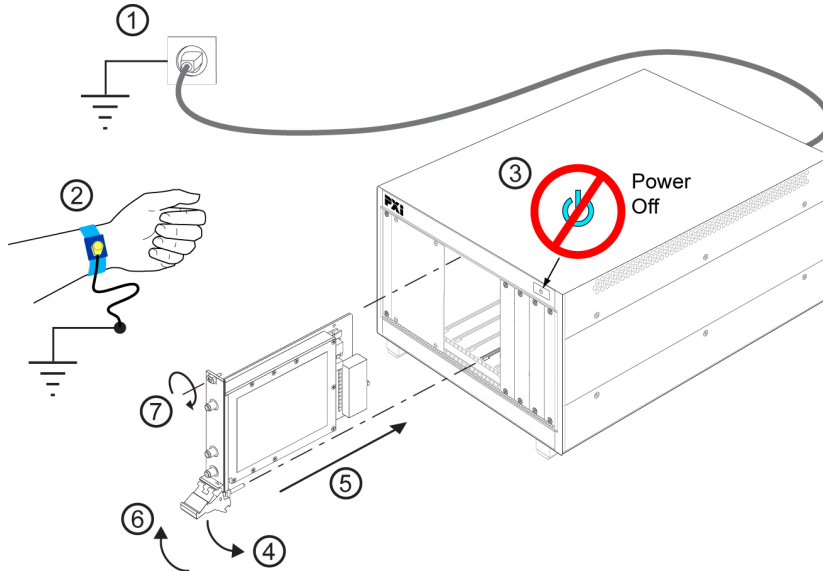
**NOTE**

The Agilent M9302A PXI Local Oscillator, Agilent M9351A PXI Downconverter, Agilent M9360A PXI Attenuator/Preselector, and modules are compatible with cPCI(J1), PXI-1, or PXIe hybrid slots. The Agilent M9202A PXIe IF Digitizer module is compatible with a PXIe or PXIe hybrid slot.

- Make sure that the line cord is plugged in to establish earth ground and that the chassis power switch is in the Off (Standby) position.
- If the chassis has multiple fan speed settings, ensure that the fans are set to automatic. Do not set the fan speed to low or turn it off.
- Position the chassis so that there is ample space between the chassis fan intake and exhaust vents. Blockage by walls or obstructions affects the air flow needed for cooling. (Refer to the chassis documentation for more information about cooling).
- Before installing a module, be sure to remove the plastic thread protectors from the mounting screws. Before inserting the module into the chassis, back the mounting screws out to assure that there is no interference between the screws and the mounting rails.

#### Step 4: Install the Modules

5. Holding the module by the injector/ejector handle, slide it into a compatible slot, as shown in the figure below.
  - a. Install the module into the PXI slot of the chassis by placing the module card edges into the front module guides (top and bottom).
  - b. Assure that the injector/ejector handle is pushed down in the unlatched (downward) position. Slide the module to the rear of the chassis
  - c. Slide the module completely into the chassis. When you begin to feel resistance, pull up on the injector/ejector handle to fully insert and latch the module into the chassis.

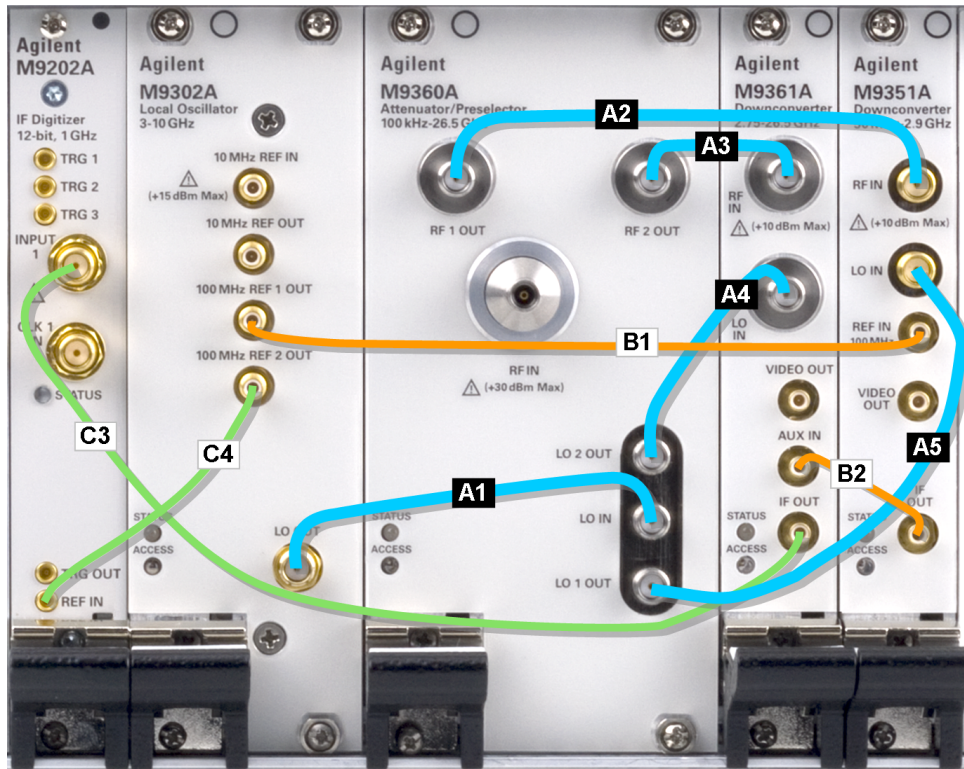


6. Secure the front panel to the chassis using the two module front-panel mounting screws. Performance may suffer if the screws are not tightened properly.
7. Verify that the PXI chassis fans are operable and free of dust and other contaminants that may restrict air-flow.
8. Install all filler panels after installing the modules. Missing filler panels may disrupt necessary air circulation in the chassis.
9. If you are using a PC host, such as the Agilent M9021, connect the Cable Interface in the chassis to the PC host per the instructions that came with the Cable Interface.
10. Power up the PXI chassis.
11. Reboot the PC host.
12. Run the module soft front panel (SFP) software, this initializes the module.
13. Check the status LEDs on the module front panels.

## Agilent M9392A Modular Instrument Connections

This section contains a cabling diagram for the Agilent M9392A PXI Vector Signal Analyzer, a cable and module association table, and a block diagram for the M9392A.

### Agilent M9392A PXI Vector Signal Analyzer Cabling Diagram



**Recommendation:** Install the semi-rigid ("A") cables first.

**CAUTION** Before removing cables from SMB and MMCX connectors, See "[SMB and MMCX Cable and Connector Care](#)" on page 16.

**NOTE:** For best measurement performance, connect a high-quality 10 MHz reference to the M9302A 10 MHz REF IN input. If no other reference is available, connect the 10 MHz reference supplied on the back of the PXI chassis.

### Cable and Module Table

Ships with Module	Ref Des	Agilent Part Number	Connection	Cable Description
M9360A	A1	M9360-20001	M9302A LO OUT – M9360A LO IN	Cable, semi-rigid, Master LO (SMA-SMA)
M9351A	A2	M9351-20001	M9360A RF 1 OUT – M9351A RF IN	Cable, semi-rigid (SMA-SMA)
M9361A	A3	M9361-20001	M9360A RF 2 OUT – M9361A RF IN	Cable, semi-rigid (SMA-SMA)
M9361A	A4	M9361-20002	M9360A LO 2 OUT – M9361A LO IN	Cable, semi-rigid (SMA-SMA)
M9351A	A5	M9351-20002	M9360A LO 1 OUT – M9351A LO IN	Cable, semi-rigid (SMA-SMA)
M9351A	B1	8120-5016	M9351A REF IN – M9302A REF 1 OUT	Cable, coaxial, SMB-SMB (160 mm)
M9351A	B2	8121-2072	M9351A IF OUT – M9361A AUX IN	Cable, coaxial, SMB-SMB (75 mm)
M9202A	C3	8120-5531	M9361A IF OUT – M9202A INPUT 1	Cable, SMB - SMA coaxial (190 mm)
M9202A	C4	8121-2042	M9302A REF 2 OUT – M9202A REF IN	Cable, A06/A32 80G (SMB-MMCX)
M9202A	*	8121-2041	n/a	Cable, A06/A32 190G (SMB-MMCX)
M9202A	*	8121-2041	n/a	Cable, A06/A32 190G (SMB-MMCX)

**Torque specification** for all SMA connectors is 8 Lb-In (0.904 Nm).

\* These cables are not required to configure an Agilent M9392A PXI Vector Signal Analyzer. See the Agilent M9392A PXI Vector Signal Analyzer Cabling Diagram above. These cables are provided for using the Agilent M9202A PXI IF Digitizer in other applications.

No cables are shipped with the Agilent M9302A PXI Local Oscillator module.



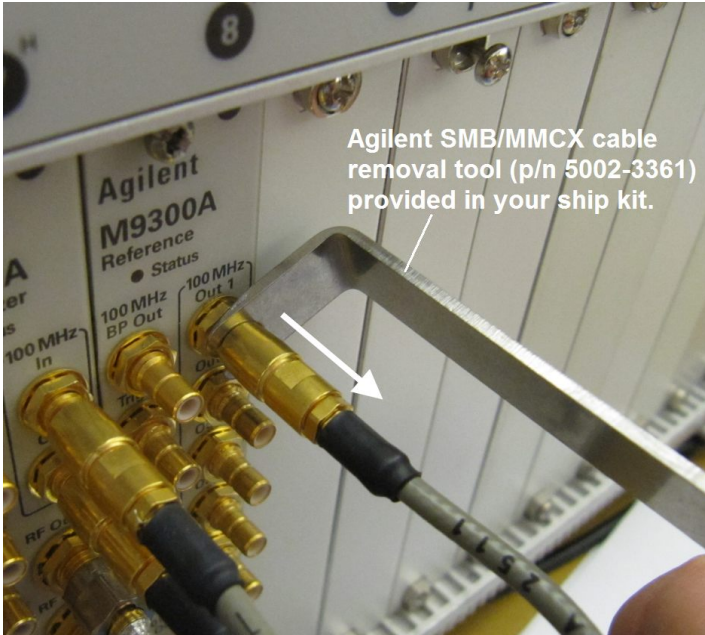
#### Step 4: Install the Modules

### SMB and MMCX Cable and Connector Care

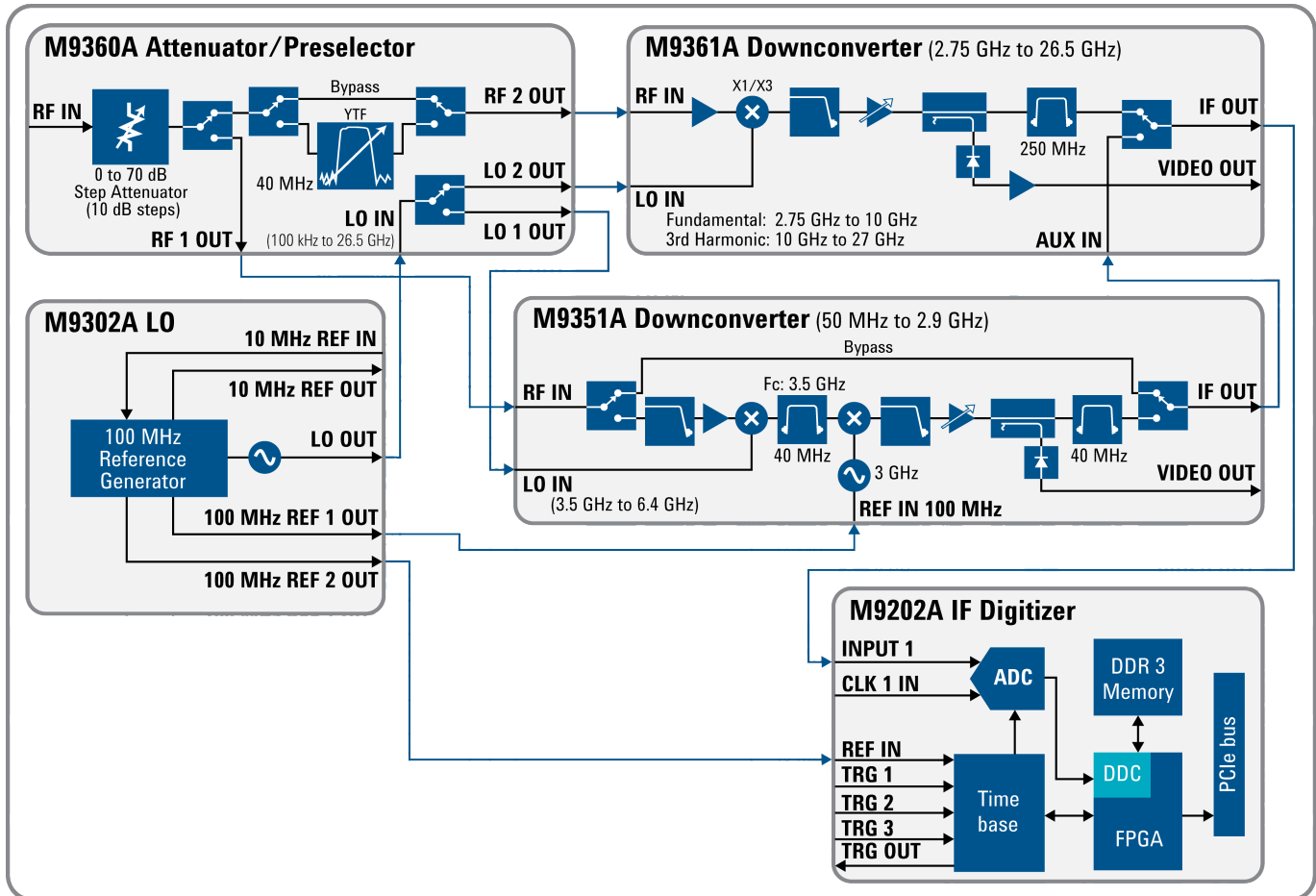
Use the Agilent SMB/MMCX Cable Removal Tool to disconnect SMB and MMCX cables from the module front panel connectors.

**CAUTION**

To avoid damage to the cables or connectors, pull the cable straight away from the connector. Do not use the tool as a pry bar.



## Agilent M9392A Block Diagram



M9392A Block Diagram Reference Table for M9302A

M9302A PXI Local Oscillator Operation		
Input	Connector	Output
Frequency: 10 MHz Input level: 0 ± 4 dB	10 MHz REF IN	
	10 MHz REF OUT	Frequency: 10 MHz Output level: 0 dBm ± 3 dB
	100 MHz REF 1 OUT	Frequency: 100 MHz (M9351A Downconverter) Output level: 0 dBm ± 3 dB
	LO OUT	Output frequency: <ul style="list-style-type: none"> <li>Using M9351A Downconverter = 3.0 GHz to 10 GHz (3.65 GHz higher than RF IN)</li> <li>Using M9361A Downconverter = 2.75 GHz to 10 GHz (500 MHz higher than RF IN)</li> </ul> Output power level: +16 dBm ± 2 dB
	100 MHz REF 2 OUT	Frequency: 100 MHz (M9202A PXIe Digitizer REF IN) Output level: 0 dBm ± 3 dB

Step 4: Install the Modules

**M9392A Block Diagram Reference Table for M9360A**

M9360A PXI Attenuator/Preselector Operation		
Input	Con- nector	Output
Used in a M9392A VSA configuration: <ul style="list-style-type: none"> <li>• Input Level: +30 dBm</li> <li>• Frequency: 50 MHz to 26.5 GHz</li> </ul>	RF IN	
	RF 1 OUT	Used in a M9392A VSA configuration: <ul style="list-style-type: none"> <li>• RF 1 OUT: -30 dBm to -160 dBm</li> <li>• Frequency: 50 MHz to 26.5 GHz</li> <li>• RF IN to RF 1 OUT insertion Loss: &lt; 2 dB</li> </ul>
	RF 2 OUT	Used in a M9392A VSA configuration: <ul style="list-style-type: none"> <li>• RF 2 OUT: -30 dBm to -160 dBm</li> <li>• Frequency:               <ul style="list-style-type: none"> <li>◦ Bypassed: <math>\geq 2.75</math> GHz to 26.5 GHz</li> <li>◦ YTF: <math>\geq 2.75</math> GHz to 26.5 GHz, BW = 40 MHz</li> </ul> </li> <li>• RF IN to RF 2 OUT Insertion Loss:               <ul style="list-style-type: none"> <li>◦ Bypass = 7 dB</li> <li>◦ YTF = 12 dB</li> </ul> </li> </ul>
M9360A PXI Preselector/Attenuator <ul style="list-style-type: none"> <li>• Input Level: +30 dBm</li> <li>• Max Frequency: 100 kHz to 26.5 GHz</li> </ul>	RF IN	
	RF 1 OUT	M9360A PXI Attenuator/Preselector <ul style="list-style-type: none"> <li>• RF 1 OUT: -30 dBm to -160 dBm</li> <li>• Frequency: 100 kHz to 26.5 GHz</li> <li>• RF IN to RF 1 OUT insertion loss: &lt; 2 dB</li> </ul>
	RF 2 OUT	M9360A PXI Attenuator/Preselector <ul style="list-style-type: none"> <li>• RF 2 OUT: -30 dBm to -160 dBm</li> <li>• Frequency:               <ul style="list-style-type: none"> <li>◦ Bypassed = <math>\geq 2.75</math> GHz to 26.5 GHz</li> <li>◦ YTF = <math>\geq 2.75</math> GHz to 26.5 GHz, BW = 40 MHz</li> </ul> </li> <li>• RF IN to RF 2 OUT Insertion Loss:               <ul style="list-style-type: none"> <li>◦ Bypass = 7 dB</li> <li>◦ YTF = 12 dB</li> </ul> </li> </ul>

**M9392A Block Diagram Reference Table for M9361A**

M9361A PXI Downconverter Operation		
Input	Con- nector	Output
RF IN: -30 dBm to -160 dBm Frequency: 2.75 GHz to 26.5 GHz	RF IN	
	IF OUT	Output power: -2 dBm <ul style="list-style-type: none"> <li>• If the IF OUT frequency is 500 MHz, the preselector is in YTF bypass mode and BW range is up to 250 MHz.</li> <li>• If the IF OUT frequency is 468.75 MHz, the preselector is in YTF bypass mode and BW range is limited to &lt; 50 MHz.</li> <li>• If preselector is enabled, the BW range is 1 kHz to 30 MHz</li> </ul>
M9361A PXI Downconverter AUX IN (See IF OUT of M9351A)	IF OUT	
Frequency: 2.75 GHz to 10 GHz (500 MHz above RF Input frequency)	LO IN	

**M9392A Block Diagram Reference Table for M9351A**

M9351A PXI Downconverter Operation		
Input	Connector	Output
Used in a M9392A VSA configuration: <ul style="list-style-type: none"> <li>RF IN: -30 dBm to -160 dBm</li> <li>Frequency:                             <ul style="list-style-type: none"> <li>50 MHz to &lt; 2.75 GHz</li> </ul> </li> </ul>	RF IN	
M9351A RF Downconverter operation Normal IF Path mode <ul style="list-style-type: none"> <li>Frequency: 50 MHz to 2.9 GHz</li> <li>Bypassed IF Path mode frequency: 50 MHz to 625 MHz</li> </ul>	RF IN	
<p><b>NOTE:</b> The path selection (down-converter or bypass) depends on the input frequency and selected BW.</p> <ul style="list-style-type: none"> <li>Downconverter path: Input frequencies <math>\leq 70</math> MHz and <math>&gt;605</math> MHz go through the downconverter path. Input frequencies <math>&gt;70</math> MHz and <math>\leq 605</math> MHz and BW set to <math>\leq 40</math> MHz go through the downconverter path.</li> <li>Bypass path: Input frequencies <math>&gt;70</math> MHz and <math>\leq 605</math> MHz and BW set to <math>&gt; 40</math> MHz go through the bypass path.</li> </ul>	IF OUT	<p>Downconverter path:</p> <ul style="list-style-type: none"> <li>Downconverter path is selected when frequency is 50 MHz to <math>\leq 70</math> MHz and <math>&gt; 605</math> MHz to <math>&lt;2.75</math> GHz                             <ul style="list-style-type: none"> <li>IF OUT = 500 MHz @ BW range = 1 kHz to 40 MHz</li> </ul> </li> <li>Downconverter path is selected when BW <math>&lt; 40</math> MHz and frequency is <math>&gt;70</math> MHz to <math>\leq 605</math> MHz                             <ul style="list-style-type: none"> <li>IF OUT = 500 MHz @ BW range = 1 kHz to 40 MHz</li> </ul> </li> <li>Normal (Downconverter) path output is -2 dBm (500 mV p-p)                             <ul style="list-style-type: none"> <li>The RF IN to IF OUT gain is <math>\sim 38</math> dB</li> </ul> </li> <li>The BW is dependent on the RF IN Frequency:                             <ul style="list-style-type: none"> <li>Lower-side BW = RF IN - 50 MHz</li> <li>Upper-side BW = 625 MHz - RF IN</li> </ul> </li> </ul> <p>Bypass path only:</p> <ul style="list-style-type: none"> <li>Bypass path is selected when BW <math>&gt; 40</math> MHz and input frequency is <math>&gt;70</math> MHz to <math>\leq 605</math> MHz                             <ul style="list-style-type: none"> <li>IF OUT = RF IN</li> </ul> </li> <li>The bypass path has a maximum BW of 575 MHz and is available at an RF IN frequency of 337.5 MHz. The BW drops linearly to a maximum BW of 40 MHz as RF IN frequency decreases to a frequency of 70 MHz or increases to 605 MHz.                             <ul style="list-style-type: none"> <li>IF OUT level: Bypass path is -2.5 dB loss</li> <li>Gain: N/A</li> </ul> </li> <li>The BW is dependent on the RF IN Frequency:                             <ul style="list-style-type: none"> <li>Lower-side BW = RF IN - 50 MHz</li> <li>Upper-side BW = 625 MHz - RF IN</li> </ul> </li> </ul>
2.75 GHz to 10 GHz (LO frequency is set to 3.5 GHz above RF IN for downconverter operation) Input Power Level: +15 dBm $\pm$ 2 dB for optimal performance.	LO IN	
100 MHz Input Level: 0 dBm $\pm$ 3 dB	RF IN	

**M9392A Block Diagram Reference Table for M9202A**

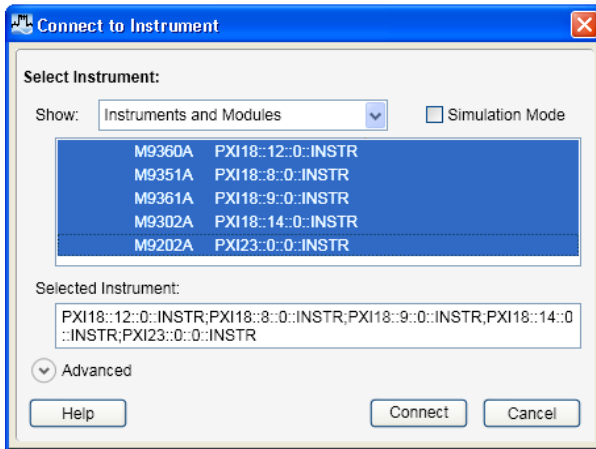
M9202A PXI Digitizer 12 Bit Operation		
Input	Connector	Output
Input level: - 2 dBm Frequency: 30 MHz to 1 GHz	INPUT 1	
Input level: +4 dBm $\pm$ 3 dB Frequency: 100 MHz	REF IN	

## Step 5: Verify Operation of the Agilent M9392A PXI Vector Signal Generator

In this step you will verify correct operation of the Agilent M9392A PXI Vector Signal Analyzer. Before running a Self Test or performing a Field Calibration, assure that all required software is installed, the chassis is powered on, and all cabling is correct. See "[Agilent M9392A Modular Instrument Connections](#)" on page 15 for proper cabling.

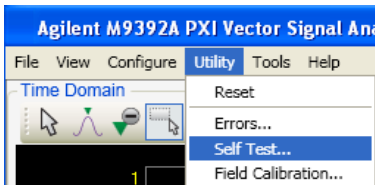
The first step in this process is to conduct a Self Test of the M9392A

1. Open the M9392A soft front panel (SFP).
2. Upon opening the SFP, you are presented with the "Connect to Instrument" dialog. Select all the modules that are components of the M9392A and press **Connect**. For example:

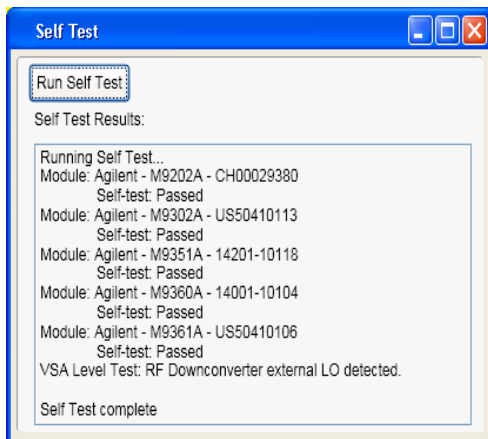


**NOTE** If your installed modules are not listed, restart your PC or embedded controller to establish these connections.

3. Conduct a Self Test (**Utility > Self Test... > Run Self Test**). The M9392A Self Test runs each module through its own Self Test.



- a. If the Self Test passes, go to next step.
- b. If the M9392A Self Test fails, it indicates which module may need repair. See "[M9392A Troubleshooting](#)" on page 23 to clearly determine the source of the failure.



## Conduct M9392A Field Calibration

### Required Hardware

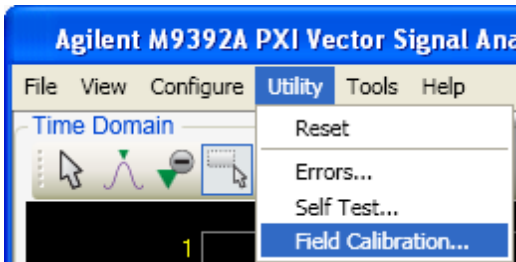
Please refer to the following table for recommended hardware. Additionally, some high-quality flexible 3.5 mm cables will be required, plus adapters to connect the PSG (precision signal generator) and power meter to 3.5 mm connectors.

Hardware	Description
Agilent E8257D-532 or E8267D-532	Precision Signal Generator 31.8 GHz
Agilent N1913A or N1914A	Single / Dual Channel Power Meter
Agilent N8485A, Option 100	10 MHz to 26.5 GHz Power Sensor
Agilent 11730A	Power Sensor Cable

A Field Calibration should be performed upon initial setup and whenever one of more of the modules that compose the M9392A PXI Vector Signal Analyzer is removed, reconfigured into different slots, or when cables are disconnected or changed. The Field Calibration should be repeated on a regular three month schedule, in order to achieve the highest level of performance.

Perform an Agilent M9392A PXI Vector Signal Analyzer Field Calibration by using the M9392A SFP and the included Help system.

1. Open the M9392A soft front panel (SFP).
2. Conduct a Field Calibration (**Utility > Field Calibration...**).



Use the **Help** button on the Agilent M9392A Field Calibration screen to access context-sensitive help to guide you through the procedure.

## Step 6: Installation is Complete

Proceed to program your product by means of the application programming interface (API) for the supplied drivers.

### API Overview

#### IVI Drivers

Agilent's IVI drivers simplify the creation and maintenance of instrument control applications in a variety of development environments; they allow programmatic control of instrumentation while providing a greater degree of instrument interchangeability and code reuse. IVI drivers currently come in two basic types: IVI-COM and IVI-C. Although the functionality offered by both types of drivers is often very similar, the fundamental differences in interface technology results in a very different end-user experience. The IVI drivers support compiling application programs for 32- or 64-bit platforms.

**Supported ADEs:** Arguably the most important consideration in comparing IVI-COM and IVI-C drivers is the end user experience in various ADEs. Since IVI-COM drivers are based on Microsoft COM technology, it's not surprising that IVI-COM drivers offer the richest user experience in Microsoft ADEs. Users working in Visual C++, Visual C#, Visual Basic.NET, and Visual Basic 6 enjoy a host of features, such as object browsers, IntelliSense, and context-sensitive help.

When you install the product software, the IVI driver files are installed in the standard IVI Foundation directories (for example, C:\Program Files\IVI Foundation\IVI\Drivers\AgM9392). Example programs are provided to demonstrate most driver functionality (for example, C:\Program Files\IVI Foundation\IVI\Drivers\AgM9392\Examples). The reference material for the driver functions (a Microsoft HTML Help .chm file) is installed with the IVI driver and is available for Microsoft Visual Studio's IntelliSense context linking. In addition, you can directly access the chm file (AgM9392.chm) from this Start menu location: **Start > All Programs > Agilent IVI Drivers > AgM9392 > Documentation.**

#### LabVIEW Driver

In addition to the IVI drivers, Agilent provides a LabVIEW driver that includes all the functionality of the IVI-C driver. When you install the product software, the LabVIEW driver is installed to each LabVIEW instr.lib directory for each version of LabVIEW you have on your computer. Example programs are provided to demonstrate most driver functionality. The reference information for the driver (a Microsoft HTML Help .chm file) is also installed with the driver and the content is available from LabVIEW's Context Help window. In addition, you can directly access the chm file (AgM9392\_LabVIEW\_Help.chm) from this Start menu location: **Start > All Programs > Agilent > M9392 > AgM9392 LabVIEW Help.**

## M9392A Specifications

The Data Sheet for the M9392A is included on the Agilent M9392A VSA Software and Product Information CD that came with your module. This document contains specification information. To find the latest update, go to <http://cp.literature.agilent.com/litweb/pdf/5990-6050EN.pdf>.

# M9392A Troubleshooting

## Communications

If you are unable to communicate with the M9392A, verify that the following installations are correct:

- Agilent IO Libraries Suite
- M9392A SFP
- Module and chassis drivers
- System Interface Card, cable and PC PXI card connections
- If no modules are visible in the SFP "Connect to Instrument" dialog or in Agilent Connection Expert, restart your PC or embedded controller to establish these connections.

## Modular Instrument Troubleshooting Overview

Between the low frequency path (through the M9351A) and the high frequency path (through the M9361A) there are three common modules and one unique to the path (See "[Agilent M9392A Block Diagram](#)" on page [17](#)).

To troubleshoot a modular instrument problem, first:

1. Check cabling.
2. Check the front panel Status LEDs.
3. Check the M9392A SFP (soft front panel) Status Tab and Self Tests.
4. Perform a modular instrument level operational check.
5. If a suspect module still can't be identified, determine the frequency range at which the problem occurs and See "[Frequency Range Troubleshooting](#)" on page [34](#) to identify the most likely module(s) and then perform the module operational checks found in the Startup Guides.

## Cables

- Start by verifying ALL cables are properly connected and SMA connectors are torqued to 8 Lb-In (0.904 Nm).
- See "[Agilent M9392A Modular Instrument Connections](#)" on page [15](#) for instrument-level cabling. M9392A cable connections are also available from the M9392A SFP, by selecting **Configure > Cable Configuration**.

## Modular Instrument Level Troubleshooting

Modular instrument level troubleshooting can be used to identify possible cabling errors and a limited number of module performance issues without compromising the Field Calibration. The modular instrument level troubleshooting procedure starts by looking at the front panel LEDs, progresses to the modular instrument level soft front panel (SFP) interface and then offers a limited set of operational checks aimed at identifying a suspect module. Once a suspect module is identified it becomes necessary to remove cables (compromising the Field Calibration) to perform the module operational check to verify the module's performance. At the modular instrument level you are encouraged to modify frequency points and power levels to cover suspect problem areas.

## Configuration/Setups

- Verify all module interconnect cable routings, and SMA connectors are torqued to 8 Lb-In (0.904 Nm).
- No RF signal is routed into the Agilent M9360A PXI Attenuator/Preselector RF IN connector.
- No 10 MHz reference signal is routed into the Agilent M9302A PXI Local Oscillator.
- The M9392A SFP (soft front panel) is active.
- SFP Measurement Frequency is set to 3 GHz (default condition).



Status LED States

**NOTE**

Once you open the M9392A SFP, select a module, and then choose **Connect**. The module is initialized. Until it is initialized, the LED behavior is not entirely predictable. The front panel LED behavior is valid only when the soft front panel (SFP) is running or when the `Initialize` function/method has been called, using the application programming interface (API).

Module	Green	Amber	Red	Off
M9202A	Indicates the trigger is armed and waiting for a valid trigger to occur.	Identifies the module associated with the current channel in the Soft Front Panel when the “Finder” button is depressed.	Indicates that the trigger has occurred, the acquisition is complete, and the data is waiting to be read.	Indicates a failure in the power supplies. Module hardware health can't be determined until the power supply failure is resolved.
M9302A	All power supplies are functioning within their tolerances, and all hardware is functioning and a 10 MHz Ref In is connected.	Indicates that all power supplies are functioning within their tolerances, but there may be other hardware failures.	<ul style="list-style-type: none"> <li>Indicates a failure in the power supplies and module hardware.</li> <li>Indicates the absence of the 10 MHz REF IN signal or 10 MHz is present, but SFP has not initialized.</li> </ul>	Indicates a failure in the power supplies. Module hardware health can't be determined until the power supply failure is resolved.
M9351A	Indicates that all power supplies are functioning within their tolerances, and all hardware is functioning.	Indicates that all power supplies are functioning within their tolerances, but there may be other hardware failures.	<ul style="list-style-type: none"> <li>Indicates a failure in the power supplies and module hardware.</li> <li>When Meas Frequency is <math>\geq 2.75</math> GHz</li> <li>When the M9351A LO IN is disconnected.</li> <li>When the M9360A LO IN is disconnected.</li> <li>When the 100 MHz REF IN is disconnected.</li> </ul>	Indicates a failure in the power supplies. Module hardware health can't be determined until the power supply failure is resolved.
M9360A	Indicates that all power supplies are functioning within their tolerances, and all hardware is functioning.	Indicates that all power supplies are functioning within their tolerances, but there may be other hardware failures.	Indicates a failure in the power supplies and module hardware.	Indicates a failure in the power supplies. Module hardware health can't be determined until the power supply failure is resolved.
M9361A	Indicates that all power supplies are functioning within their tolerances, and all hardware is functioning.	Indicates that all power supplies are functioning within their tolerances, but there are other hardware failures.	Indicates a failure in the power supplies and module hardware.	Indicates a failure in the power supplies, but module hardware seems to be functioning. Module hardware functioning indication can be erroneous in this mode since this circuitry can be compromised by a power supply failure.

Once the SFP is used, the LED may be red. When first plugged in, it may or may not be red.

**Access LEDs (normal states)**

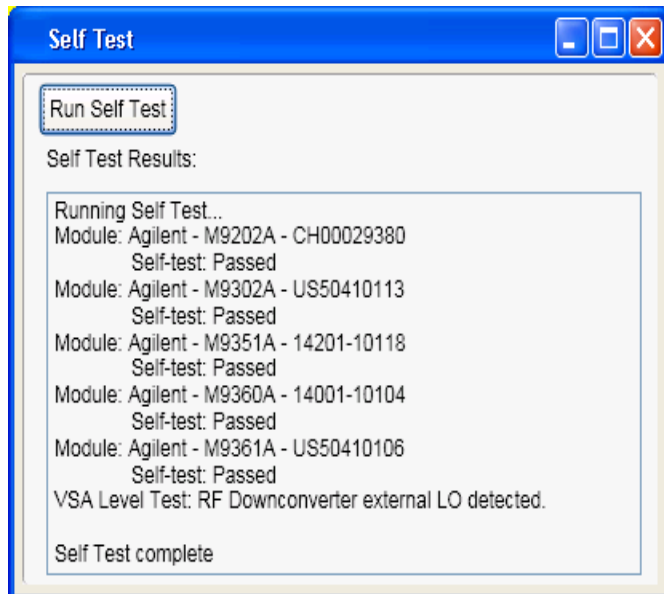
- M9202A - none
- M9302A - blinks on and off when SFP is active
- M9360A - blinks on and off when SFP is active
- M9361A - blinks on and off when SFP is active
- M9351A - blinks on and off when SFP is active

**M9392A Soft Front Panel Status Tab (normal states)**

M9202A	M9302A	M9351A	M9360A	M9361A
<ul style="list-style-type: none"> <li>• Temperature: green</li> <li>• Ref Level: green</li> </ul>	<ul style="list-style-type: none"> <li>• 10 MHz Ref In: UNLOCKED (yellow) without a 10 MHz Ref In, LOCKED (green) with a 10 MHz Ref In</li> <li>• Ref: LOCKED (green)</li> <li>• Temperature: green</li> <li>• Voltage (+12, +5, +3.3, -12): green</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature: green</li> <li>• Voltage (+12, +5, +3.3, -12): green</li> <li>• Ref Level: OK (green)</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature: green</li> <li>• Voltage (+12, +5, +3.3, -12): green</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature: green</li> <li>• Voltage (+12, +5, +3.3, -12): green</li> <li>• Ref Level: OK (green)</li> </ul>

**M9392A Soft Front Panel Self Tests**

Start the M9392A SFP self tests by selecting: **Utility > Self Test > Run Self Test**. Once completed, a dialog box appears and reports on each of the modules, indicating its serial number and if it passed or failed.



## Possible Self Test Failures

**CAUTION**

The chassis must be turned off when installing or removing modules.

1. Power supply failure:
  - a. If a voltage failure is reported, check the voltages on the other modules, using the SFP Status tab. Since power supply failures can be related to chassis or module failures, the first step is to check for a defective module.
  - b. If the problem is limited to the one module on the SFP Status tab, turn power off and move that module to a different slot (cable connections are not required). Turn power back on and check again.
    - i. Replace the module if the voltage is still bad.
    - ii. If the voltage is good, after moving the module to a different slot, check the chassis power supply.
  - c. If more than one module voltage is bad, there is a possibility the chassis is bad or one of the modules may be pulling down the power supply. Start by turning power off, removing one module at a time and turning power on.
  - d. Continue removing one module at a time until only one module remains.
    - i. If the voltage is good after removing a module, reinstall the other modules.
    - ii. If the voltage is still good after reinstalling the other modules, the module that was pulling the power supply down needs to be repaired.
    - iii. If the voltage is bad after reinstalling the other modules troubleshoot the chassis.
    - iv. If the voltage is still bad after removing all but the last module, remove the last module and reinstall one of the modules that was previously removed.
    - v. If the voltage is still bad, troubleshoot the chassis.
2. Temperature failure:
  - a. Temperature failures indicate over temperature.
    - i. Verify that blank panels have been installed in any open slot on the chassis.
    - ii. Make sure the chassis air intake and outlets are open and not blocked.
    - iii. Verify the chassis fans are working and fan speed to is set to Auto.
    - iv. Verify the ambient temperature is within the instrument operating range (0° C to 50° C).
    - v. If a single module over-temperature has not been resolved, the module is most likely starting to fail and should be serviced.
3. M9351A - :LO Sense:
  - a. LO Sense indicates the M9351A is not able to detect the LO IN signal. If you get an LO Sense indication, check:

**NOTE**

Removing the following cables negates the Field Calibration.

- i. A5 cable connections between the M9351A LO IN and the M9360A Attenuator/Preselector LO 1 OUT.
- ii. A1 cable, M9302A LO OUT to M9360A LO IN

- b. 100 MHz Ref Lock - Indicates the M9351A does not detect a 100 MHz REF IN. If you get a 100 MHz Ref Unlock indication, check cable B1, 100 MHz REF 1 OUT to M9351A 100 MHz REF IN. If this cable is removed it does not affect the Field Calibration.
  - c. If all cables are properly connected, verify the LO outputs by using the M9302A Operational Check.
4. M9302A- LO Unlock:
- a. LO Unlock indicates that the M9302A module has a LO failure and needs to be replaced.

### Modular Instrument Level - Checking Operation <2.75 GHz (M9351A path)

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#### NOTE

Setting the M9392A SFP Input Power below the actual RF input level creates an OVERLOAD condition that stops sweep and can damage the downconverter. Once the Input Level is reset and the OVERLOAD condition cleared, Select **Sweep: Cont** to restart sweep.

---

1. Select **Utility > Reset**.
2. Select the **Display** tab.
  - a. Set Display: Frequency
  - b. Frequency Display: **Auto Scale** (unchecked)
  - c. Scale: 10 dB/div
  - d. Ref Level: +30 dBm
3. Under the **Meas** tab, the **Settings** should be as follows:
  - a. Use Preselector: (unchecked)
  - b. Frequency: 50 MHz
  - c. Input power: set to +30 dB
  - d. Time span: 100  $\mu$ s
  - e. Trigger - Source Free Run
  - f. Sweep - Cont.
4. Connect an RF signal to the M9360A RF IN. Set the source to the following frequency and power:
  - a. Frequency: 50 MHz
  - b. Power Level: -20 dBm
5. With the M9392A set to display frequency:
  - a. Monitor the signal level while stepping the source and M9392A up in frequency in 100 MHz steps to 2.74 GHz.
  - b. The power level should stay within  $\pm 3$  dB.
  - c. If power levels vary more than expected, check that cables are properly connected and torqued.
  - d. Recheck areas of concern.
  - e. If power levels still vary greater than expected, perform the M9351A, M9360A, and M9302A module level operational checks.
6. Select **Utility > Reset**.

7. Select the **Display** tab:
  - a. Set **Display: Frequency**
  - b. Frequency Display: Auto Scale (unchecked)
  - c. Scale: 10 dB/div
  - d. Ref Level: +30 dBm
8. Under the **Meas** tab, the **Settings** should be as follows:
  - a. Use Preselector: (unchecked)
  - b. Frequency: 2 GHz
  - c. Input power: set to +30 dBm.
  - d. Bandwidth: set to 40 MHz
  - e. Time span: 100  $\mu$ s
  - f. Trigger - Source: Free Run
  - g. Sweep - Cont.
9. Connect an RF signal to the M9360A RF IN. Set the source to the following frequency and power:
  - a. Frequency: 2 GHz
  - b. Power level: -20 dBm
10. On the **Meas** tab:
  - a. Step the Input Power down in 10 dB increments to 0 dBm.
  - b. The path is alright if:
    - i. The noise floor drops approximately 10 dB each time the Input Power level is decreased.
    - ii. The attenuator clicks as it switches. The attenuator switches when stepping between the levels displayed in the table in Step 11.
11. To check all levels, set the following conditions, and set the input power level first to avoid an OVER-LOAD condition.

RF Input Power	Set Display Ref-Level	Change Meas Input level From	To
-20 dBm	+30 dBm	+30 dBm	+20 dBm
-20 dBm	+30 dBm	+20 dBm	+10 dBm
-20 dBm	+0 dBm	+10 dBm	+0 dBm
-20 dBm	+0 dBm	+0 dBm	-10 dBm
-20 dBm	-20 dBm	-10 dBm	-20 dBm
-50 dBm	-30 dBm	-20 dBm	-30 dBm
-50 dBm	-30 dBm	-30 dBm	-40 dBm

12. Reset Meas Input Power to +30 dBm.
13. On the source:
  - a. Step the power level down to +30 dBm.
  - b. The power level on the M9392A should drop by 10 dB with each decrease in power level.

**Measure the IF OUT levels <2.75 GHz**

1. Source input frequency: 2 GHz
2. Power level: -10 dBm
3. M9392A SFP settings:
  - a. Frequency: 2 GHz
  - b. Input power: -10 dBm
4. At the M9351A IF OUT: ~260 mV p-p @ 500 MHz (~ -1.5 dBm to -4.0 dBm)
5. At the M9361A IF OUT: ~250 mV p-p @ 500 MHz (~ -1.5 dBm to -4.5 dBm)

**Modular Instrument Level - Checking Operation 2.25 GHz to 2.75 GHz (M9361A path)****NOTE**


---

Setting the M9392A SFP Input Power below the actual RF input level creates an OVERLOAD condition that stops sweep and can damage the downconverter. Once the Input Level is reset and the OVERLOAD condition cleared, Select **Sweep: Cont** to restart the sweep.

---

1. Select **Utility > Reset**
2. Select the **Display** tab.
  - a. Set **Display: Frequency**
  - b. Frequency Display: **Auto Scale** (unchecked)
  - c. Scale 10 dB/div
  - d. Ref Level: +30 dBm
3. Under the **Meas** Tab the **Settings** should be as follows:
  - a. Use Preselector: (unchecked)
  - b. Frequency: 2.25 GHz
  - c. Input power: set to +30 dBm
  - d. Time span: 100  $\mu$ s
  - e. Trigger – Source Free Run
  - f. Sweep – Cont.
4. Connect an RF signal to the M9360A RF IN. Set the bandwidth to 250 MHz and the source to the following frequency and power levels:
  - a. Frequency: 2.25 GHz
  - b. Power level: -20 dBm

5. With the M9392A set to display frequency:
  - a. Monitor the signal level while stepping the source and M9392A up in frequency in 100 MHz steps to 2.70 GHz.
  - b. The power level should stay within  $\pm 3$  dB.
  - c. If power levels vary more than expected, check that cables are properly connected and torqued.
  - d. Recheck areas of concern.
  - e. If power levels still vary greater than expected, perform the M9351A, M9360A, and M9302A module level operational checks.
6. Select **Utility > Reset**.
7. Select the **Display** tab:
  - a. Set **Display: Frequency**
  - b. Frequency Display: Auto Scale (unchecked)
  - c. Scale: 10 dB/div
  - d. Ref Level: +30 dBm
8. Under the **Meas** tab, the **Settings** should be as follows:
  - a. Use Preselector: (unchecked)
  - b. Frequency: 2.25 GHz
  - c. Input power: set to +30 dBm.
  - d. Bandwidth: set to 250 MHz
  - e. Time span: 100  $\mu$ s
  - f. Trigger - Source: Free Run
  - g. Sweep - Cont.
9. Connect an RF signal to the M9360A RF IN. Set the source to the following frequency and power:
  - a. Frequency: 2.25 GHz
  - b. Power level: -20 dBm
10. On the **Meas** tab:
  - a. Step the Input Power down in 10 dB increments to 0 dBm.
  - b. The path is alright if:
    - i. The noise floor drops approximately 10 dB each time the Input Power level is decreased.
    - ii. The attenuator clicks as it switches. The attenuator switches when stepping between the levels displayed in the table in Step 11.

11. To check all levels, set the following conditions, and set the input power level first to avoid an OVERLOAD condition.

RF Input Power	Set Display Reference Level	Change Meas Input level From	To
-20 dBm	+30 dBm	+30 dBm	+20 dBm
-20 dBm	+30 dBm	+20 dBm	+10 dBm
-20 dBm	+0 dBm	+10 dBm	+0 dBm
-20 dBm	+0 dBm	+0 dBm	-10 dBm
-20 dBm	-20 dBm	-10 dBm	-20 dBm
-50 dBm	-30 dBm	-20 dBm	-30 dBm
-50 dBm	-30 dBm	-30 dBm	-40 dBm

12. Reset Meas Input Power to +30 dBm.
13. On the source:
- Step the power level down to +30 dBm.
  - The power level on the M9392A should drop by 10 dB with each decrease in power level.

#### Measure the IF OUT levels from 2.25 GHz to 2.75 GHz

- Source input frequency: 2.25 GHz
- Power level: -10 dBm
- M9392A SFP settings:
  - Frequency: 2.25 GHz
  - Bandwidth: 250 MHz
  - Input power: -10 dBm
- At the M9361A IF OUT: ~250 mVp-p @ 500 MHz (~-2.5 dBm to -3.0 dBm)

#### Modular Instrument Level - Checking Operation >2.75 GHz (M9361A path)

##### NOTE

Setting the M9392A SFP Input Power below the actual RF input level creates an OVERLOAD condition that stops sweep and can damage the downconverter. Once the Input Level is reset and the OVERLOAD condition cleared, Select **Sweep: Cont** to restart the sweep.

- Select **Utility > Reset**
- Select the **Display** tab.
  - Set **Display: Frequency**
  - Frequency Display: **Auto Scale** (unchecked)
  - Scale 10 dB/div
  - Ref Level: +30 dBm



3. Under the **Meas** Tab the **Settings** should be as follows:
  - a. Use Preselector: (unchecked)
  - b. Frequency: 3 GHz
  - c. Input power: set to +30 dBm
  - d. Time span: 100  $\mu$ s
  - e. Trigger – Source Free Run
  - f. Sweep – Cont.
4. Connect an RF signal to the M9360A RF IN. Set the source to the following frequency and power levels:
  - a. Frequency: 3 GHz
  - b. Power level: -20 dBm
5. With the M9392A set to display frequency:
  - a. Use the M9392A SFP to monitor the signal level while stepping the source and M9392A up in frequency in 500 MHz steps to 26.5 GHz.
  - b. The power level should stay within  $\pm 3$  dB.
  - c. If power levels vary more than expected check that all cables are properly connected and torqued.
  - d. Recheck areas of concern.
  - e. If power levels still vary more than expected, perform the M9361A, M9360A, and M9302A module level operational checks.
6. Select the **Display** tab.
  - a. Set **Display: Frequency**
  - b. Frequency Display: Auto Scale (unchecked)
  - c. Scale 10 dB/div
  - d. Ref Level: +30 dBm
7. Under the **Meas** Tab the Settings should be as follows:
  - a. Use Preselector: (unchecked)
  - b. Frequency: 3 GHz
  - c. Input power: set to +30 dBm
  - d. Time span: 100  $\mu$ s.
  - e. Trigger Source: Free Run
  - f. Sweep – Cont.
8. Connect an RF signal to the M9360A RF IN. Set the source to the following frequency and power:
  - a. Frequency: 3 GHz
  - b. Power level: -20 dBm

9. On the **Meas** Tab:
  - a. Step the Input Power down in 10 dB increments to 0 dBm.
  - b. The path is performing properly if:
    - i. The noise floor drop approximately 10 dB each time the Input Power level is decreased.
    - ii. The attenuator clicks as it switches. The attenuator switches when stepping between the levels listed in the table in Step 10.
10. To check all power levels set the following conditions and set input power level first to avoid an OVER-LOAD condition:

RF Input Power	Set Display Reference Level	Change Meas Input level From	To
-20 dBm	+30 dBm	+30 dBm	+20 dBm
-20 dBm	+30 dBm	+20 dBm	+10 dBm
-20 dBm	+0 dBm	+10 dBm	+0 dBm
-20 dBm	+0 dBm	+0 dBm	-10 dBm
-20 dBm	-20 dBm	-10 dBm	-20 dBm
-50 dBm	-30 dBm	-20 dBm	-30 dBm
-50 dBm	-30 dBm	-30 dBm	-40 dBm

11. On the **Meas** Tab, select **Use Preselector**. The power level should be close to the same level when in the thru path (Use Preselector unchecked) and the preselector path.
12. Repeat Step 6 at 10 GHz, 20 GHz and 26.5 GHz.
13. Reset **Meas** Input Power to +30 dBm.
14. On the Source:
  - a. Step the power level down in 10 dB steps.
  - b. The power level on the M9392A should drop by 10 dB with each decrease in power level.
15. If a problem occurs:
  - a. If no output, for frequencies >2.75 GHz, check the M9351A path.
  - b. If the M9351A is good, go to the module level operational check and measure the M9360A RF 2 and LO 2 OUT.
  - c. If the M9360A fails, check the M9302A.
  - d. If the M9361A passes the operational check, check the signals at M9361A end of A3.
  - e. If the M9360A is good, using the module level operational check, repeat the M9361A operational check.

**Measure the IF OUT levels  $\geq 2.75$  GHz**

1. Source input frequency: 20 GHz
2. Power level: -10 dBm
3. M9392A SFP settings:
  - a. Frequency: 20 GHz
  - b. Input power: -10 dBm
4. At the M9361A IF OUT:  $\sim 250$  mVp-p @ 500 MHz ( $\sim -1.5$  dBm to  $-4.0$  dBm)

**Settable Bandwidths and IF frequencies**

Frequency	Maximum Settable Bandwidth	IF Frequency
$\leq 625$ MHz	500 MHz	500 MHz or equal to the signal frequency if $< 500$ MHz
$> 625$ MHz to 2.74 GHz (M9351A path)	40 MHz	500 MHz
$> 2.75$ GHz to 26.5 GHz Preselector - off	250 MHz	500 MHz when bandwidth is $> 50$ MHz 468 MHz when bandwidth is $< 50$ MHz
$> 2.75$ GHz to 26.5 GHz Preselector - on	30 MHz	468 MHz
2.25 GHz to 2.75 GHz (M9361A path)	250 MHz	500 MHz

**Frequency Range Troubleshooting**

When problems occur that are related to a specific frequency range, proceed by:

1. Checking cables for proper connection and torque.
2. Performing module level operational checks and using the following table.

Frequency	Most Likely Module	Next Most Likely module
50 MHz to 450 MHz	M9351A	M9360A
50 MHz to 2.74 GHz	M9351A	M9360A
$> 2.75$ GHz	M9361A	M9360A
50 MHz to 26.5 GHz	M9302A	M9360A

# Streaming Data Overview

The Agilent M9392A PXI Vector Signal Analyzer with streaming data allows you to capture continuous (gapless) IQ data to files. Streaming data is acquired from the Agilent M9202A PXIe IF Digitizer to a circular RAM buffer on the system controller (which handles latency in disk file writes), and is simultaneously written from the RAM buffer to the controller file system. When used with an Agilent-qualified RAID storage system, up to 100 MHz bandwidth data can be continuously captured for unlimited durations (limited only by available disk space). When used with slower disk drives, streaming data can be captured to available system RAM (circular capture buffer) and then subsequently written to the slow disk drive.

- For product-specific information and support, visit [www.agilent.com/find/pxi-streaming](http://www.agilent.com/find/pxi-streaming).
- To read an application note about M9392A streaming, see <http://cp.literature.agilent.com/litweb/pdf/5990-8872EN.pdf>.

## Basic Steps to Using the M9392A Streaming Capability

1. Select the storage capability. See "[Streaming System Configuration](#)" on page 38.
2. Capture the streaming data. This can be accomplished with the M9392A Soft Front Panel (see the SFP help for details), or with one of the M9392A drivers (see the IVI driver help or LabVIEW driver help for details).
  - You can download the M9392A SFP help from [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A). If you've run the full M9392A installer, you can access the help file from this program group in the Windows Start menu: **Agilent > M9392 > M9392 Help**.
  - You can download the driver help files from [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A). If you've run the full M9392A installer, you can access the respective driver help file from these program groups in the Windows Start menu:
    - IVI Driver Help: **Agilent IVI Drivers > AgM9392 > Documentation**
    - LabVIEW Driver Help: **Agilent > M9392 > M9392 LabVIEW Help**
3. Use the Agilent DataViewer application to review the captured data and "snip" out content of interest to be played back in the Agilent 89600 Series VSA software, or converted to play on one of Agilent's arbitrary waveform generators (AWG) or vector signal generators (VSG). For details on using the DataViewer application, refer to the DataViewer help system. You can download the DataViewer help from [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A); or if you've run the full M9392A installer, you can access the help file from this program group in the Windows Start menu: **Agilent > M9392 > DataViewer Help**.
4. Analyze the captured data. Instructions are provided in the DataViewer help and the M9392A SFP help. Agilent 89600 Series VSA Software is recommended to process the recorded data files.

## System Requirements

In addition to the standard system requirements See "[Step 3: Install the Software](#)" on page 11), your system must have the software and firmware revisions listed below. If you need to upgrade, see **Upgrading your system** below.

- Agilent IO Libraries Suite (IOLS) Version 16.3.16603.3 or higher. This software must be installed first.
- If you use [Agilent 89600 Series VSA Software](#), you must have version B (89600B) before updating the M9392A software.
- M9392A software revision 1.1 or higher
- M9202A firmware revision 1.25 or higher

If you purchased your M9392A VSA instrument after September 1, 2011, it will have one of the following M9202A IF Digitizer module options, depending on your order:

- M9202AU-V05: This option is capable of 50 MHz streaming (standard).
- M9202AU-V10: This option is capable of 100 MHz streaming (option).

**NOTE**

To use streaming capture capabilities, properly configure the Agilent M9021A PCIe Cable Interface. See the M9021A Installation Guide at <http://cp.literature.agilent.com/litweb/pdf/M9021-90001.pdf>.

**Upgrading your System**

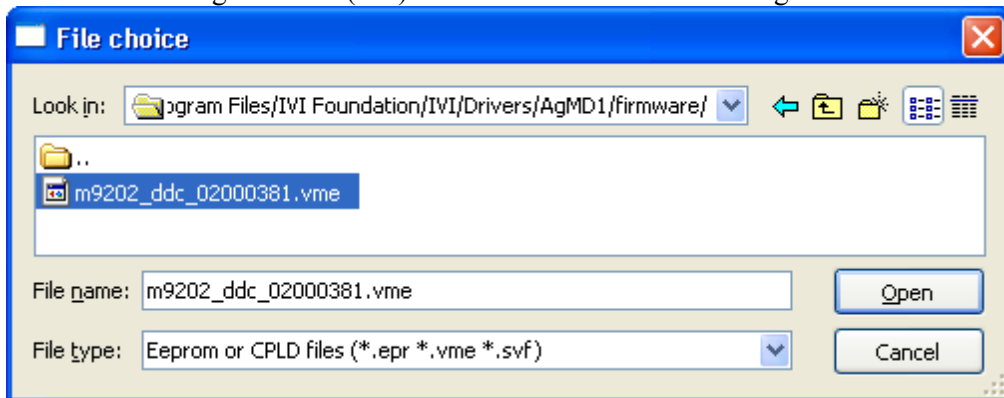
Use the following procedure if you need to upgrade your M9392A instrument for streaming. (NOTE: You can perform the upgrade at your site; there is no need to return any equipment to Agilent.)

1. Contact an Agilent representative (see [www.agilent.com/find/assist](http://www.agilent.com/find/assist)) to purchase one of these upgrade kits:
  - M9202AU-V05: 50 MHz streaming update kit
  - M9202AU-V10: 100 MHz streaming update kit
2. When Agilent receives payment for the Streaming Upgrade Kit, Agilent sends you the following:
  - License file (\*.epr file), provided on a USB flash drive (This file is also sent via email.)
  - Agilent M9392A Product Software and Information CD (M9392-10002)
  - M9202A – Option Upgrade Procedure (M9202-90011)
3. Make sure you have M9392A software version 1.1 or later installed. Also, make sure the M9202A module is installed in the chassis. If you have a version older than 1.1, install the latest software from the supplied CD, or from the Drivers & Software tab on the Technical Support page at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A).

**NOTE**

If the installer indicates it cannot proceed without removing the currently installed M9392A software, uninstall the M9392A software using Windows "Add or Remove Programs" utility.

4. Update the firmware and license files on the M9202A IF Digitizer:
  - a. Launch the AcqEepromProg.exe file (EEPROM Programmer application). The file location depends on your operating system:
    - 32-bit OS: <C:\Program Files\Agilent\MD1\bin\AcqEepromProg.exe>
    - 64-bit OS: [C:\Program Files \(x86\)\Agilent\MD1\bin\AcqEepromProg.exe](C:\Program Files (x86)\Agilent\MD1\bin\AcqEepromProg.exe)
  - b. In the EEPROM Programmer's File choice dialog, open the \*.vme file (example: m9202\_ddc\_02000381.vme) from one of these locations:
    - 32-bit OS: C:/Program Files/IVI Foundation/IVI/Drivers/AgMD1/Firmware
    - 64-bit OS: C:/Program Files (x86)/IVI Foundation/IVI/Drivers/AgMD1/Firmware



**CAUTION**

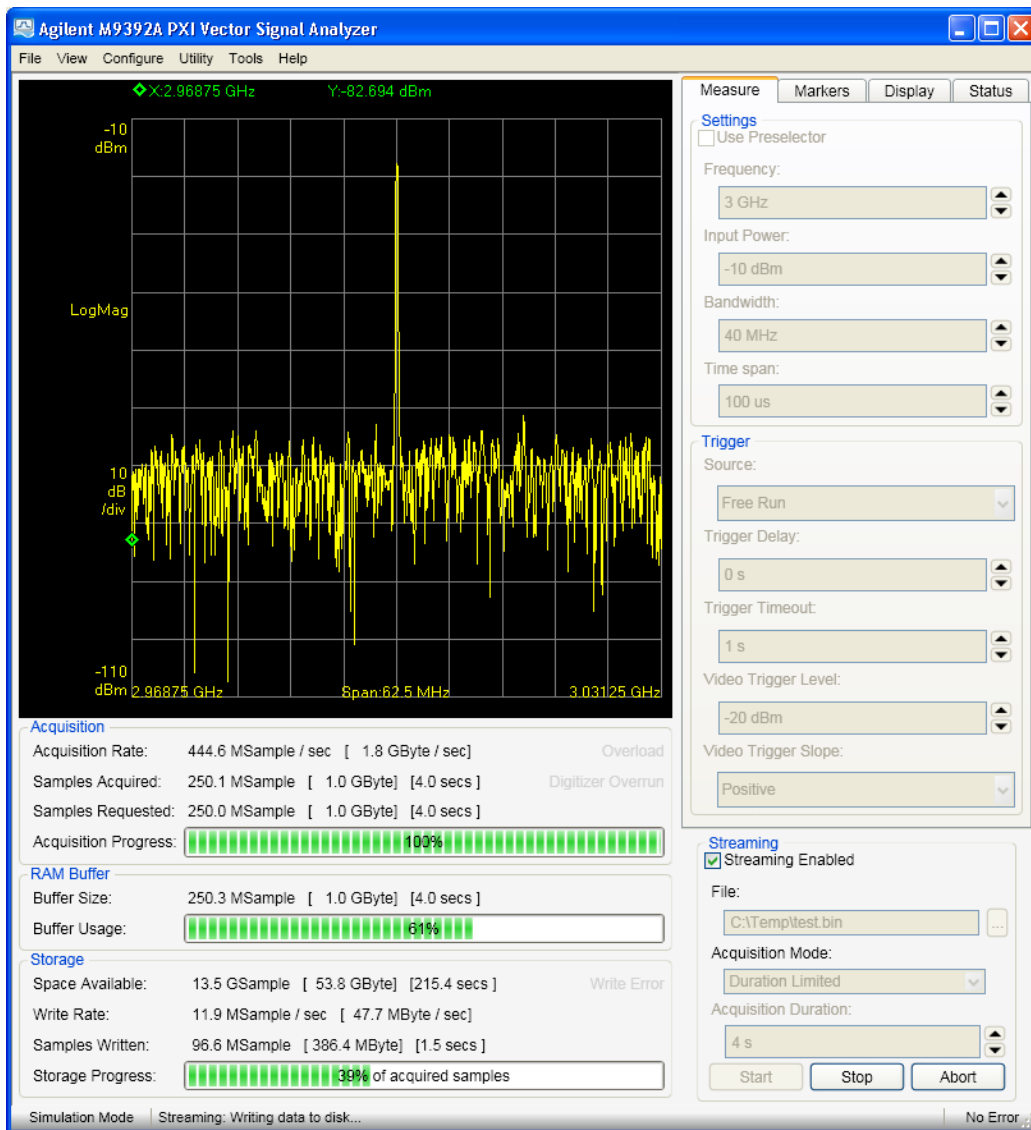
Once you Open the .vme file, it takes approximately **30 to 60 minutes** to complete the firmware update. **DO NOT STOP THE PROGRAM** during this process; doing so could damage your M9202A module.

- c. Close the EEPROM Programmer application, and all other applications.
- d. Cycle power to the chassis.


**CAUTION**

If you are using a remote controller, Shut Down the PC **BEFORE** you power down the chassis. When you restore power, power up the chassis **BEFORE** you power up the PC.

- e. Run the EEPROM Programmer application again, and load the license (\*.epr) file sent to you by Agilent Support (see Step 2 above). The license file update should only take several seconds.
5. To verify the streaming upgrade is complete and operating correctly, use the M9392A Soft Front Panel (SFP) to conduct a streaming data capture test:



- a. Open the M9392 SFP by selecting: **Start > All Programs > Agilent > M9392 > M9392 SFP**.
- b. In the SFP, select the Streaming Enabled checkbox (  Streaming Enabled ) to enable streaming.

- c. Create a test.bin file to store the streaming data. To do this, click the  (File Save As) button. In the Save As dialog, type in the file name “test.bin” and click Save.
- d. Under Acquisition Mode, select Duration Limited.
- e. Set the Acquisition Duration to 4 seconds.
- f. If you ordered the M9202AU-V10 upgrade, set the bandwidth between 50 MHz and 100 MHz. Otherwise, leave the bandwidth at the default of 40 MHz.
- g. Click the Start button to initiate the data capture. When the streaming session is complete, the status bar shows "Streaming Complete" and the Start button is re-enabled (Stop and Abort buttons are disabled).

You have completed the Streaming upgrade for your M9392A Vector Signal Analyzer and M9202A IF Digitizer.

## Streaming System Configuration

The Agilent M9392A streaming solution uses a controller disk drive, and (optionally) an external RAID solution. Controller and RAID selection depends on the data capacity, and data read/write rate requirements. The following are Agilent-recommended storage packages:

**NOTE**

Agilent's predefined external RAID packages have been tested to guarantee sustained data rates with the M9392A. These predefined mass storage packages ensure performance when used with the recommended controllers.

- Recommended controllers:

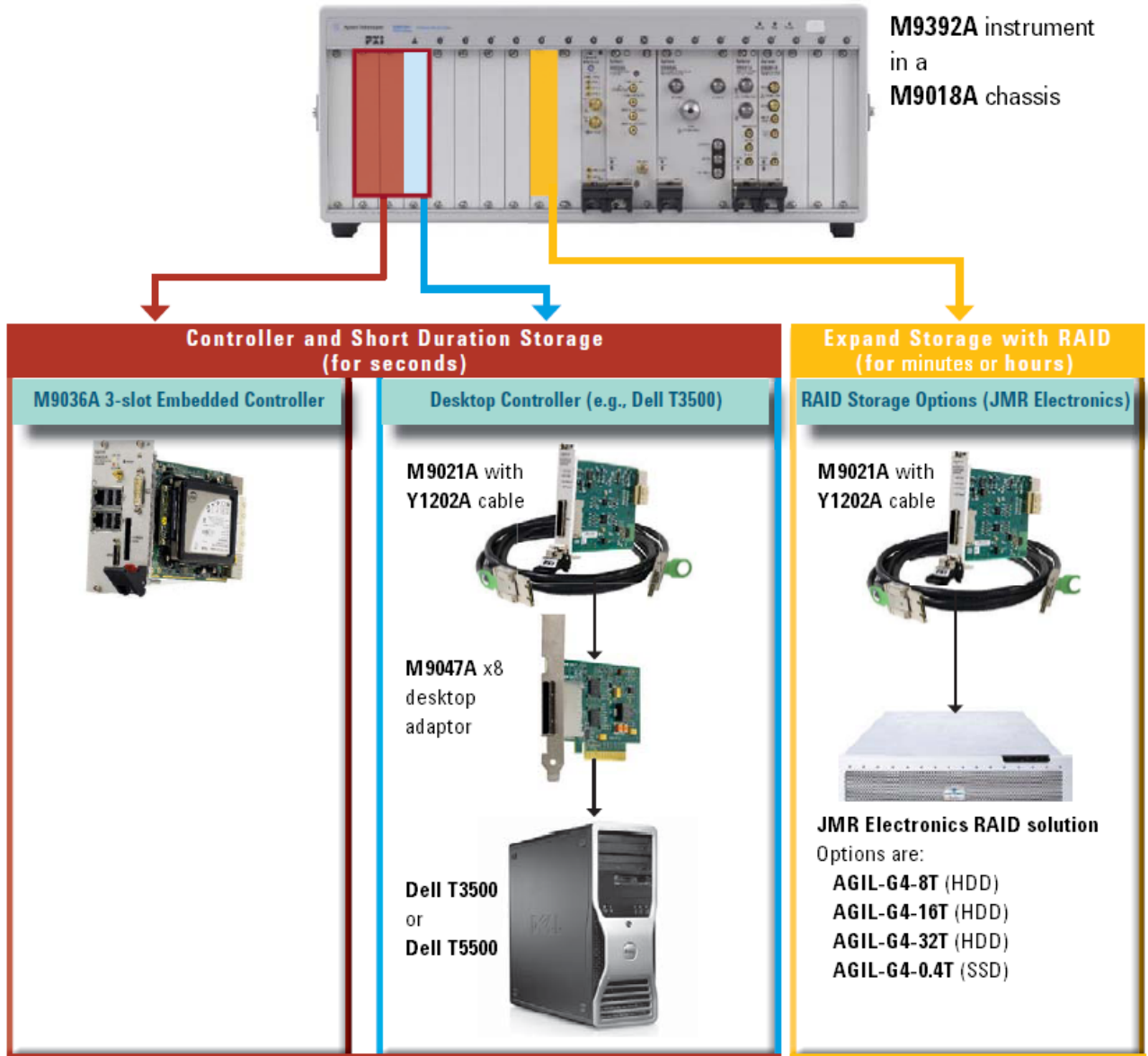
Controller	Capture Time	Disk Write Rate
Agilent <a href="#">M9036A PXIe Embedded Controller</a>	< 6 seconds @ 100 MHz BW (depends on memory)	~ 40 MB/s (assumes 4 GB RAM)
Desktop computer from the computer list at <a href="http://cp-literature.agilent.com/litweb/pdf/5990-7632EN.pdf">http://cp-literature.agilent.com/litweb/pdf/5990-7632EN.pdf</a> (for example, the Dell T3500 or Dell T5500 computer)	~ 18 seconds @ 100 MHz BW (depends on memory)	~ 40 to 100 MB/s (depends on disk drive)

- Agilent recommends the following [JMR Electronics](#) RAID storage solutions:

JMR Model	Capture Time	Disk Write Rate
<b>AGIL-G4-8T</b> (HDD)	> 3 Hours @ 100 MHz BW	> 500 MB/s
<b>AGIL-G4-16T</b> (HDD)	> 6 Hours @ 100 MHz BW	
<b>AGIL-G4-32T</b> (HDD)	> 13 Hours @ 100 MHz BW	
<b>AGIL-G4-0.4T</b> (SSD)	10 minutes @ 100 MHz BW	

For details on connecting and configuring the above JMR RAID solutions to work with the M9392A, refer to the white paper (located on the web at <http://cp-literature.agilent.com/litweb/pdf/5990-9483EN.pdf>). If you installed the M9392A software, you can access the white paper from **Start > All Programs > Agilent > M9392A > M9392A RAID White Paper**.

System diagram:





## Multichannel Overview

The M9392A provides these multichannel capabilities:

- **Multichannel Wideband Signal Analysis:** Provides wide-band multichannel analysis capability by combining two M9392A vector signal analyzers in one chassis. See "[Agilent 89600 Vector Signal Analysis Software](#)" on page 45. The M9392A modules can be configured to use a common LO, or independent LOs. See <http://cp.literature.agilent.com/litweb/pdf/5991-0135EN.pdf>.
- **Multichannel Streaming:** Combines the M9392A's multichannel capability with gapless recording to address a wide variety of test needs in wireless communications and aerospace industries. Agilent's predefined packages have been tested to guarantee sustained data rates. These predefined mass storage packages ensure performance when used with the recommended controller. See <http://cp.literature.agilent.com/litweb/pdf/5991-0221EN.pdf>.

### Hardware and Software Requirements

- Two M9392A Vector Signal Analyzers (full configuration) installed into one chassis. You have the option of using two independent M9302A LO modules, or sharing one M9302A LO module. For details on these configurations, see <http://cp.literature.agilent.com/litweb/pdf/5990-8254EN.pdf>.
  - (Optional) Agilent's predefined packages for streaming data storage have been tested to guarantee sustained data rates. For details see <http://cp.literature.agilent.com/litweb/pdf/5990-9483EN.pdf>.
- Agilent M9392A software version 1.2 or greater, and Agilent M9202A firmware version 512 or greater. If you need to upgrade your system, install the latest software from the supplied CD or from the Drivers and Software tab on the Technical Support page at [www.agilent.com/find/M9392A](http://www.agilent.com/find/M9392A). If you intend to use multichannel streaming but have not performed a streaming upgrade, See "[Upgrading your System](#)" on page 36.
- Agilent IO Library Suite (IOLS) Version 16.3.16603.3 – see <http://www.agilent.com/find/iosuite>
- Agilent 89600 VSA software version 15.0 – see <http://www.agilent.com/find/VSA>

### Basic Steps to Using the M9392A Multichannel Capability

#### M9392A Soft Front Panel (SFP)

The M9392A SFP is used primarily to configure and control a complete Agilent M9392A PXI Vector Signal Analyzer, or a single Agilent M9202A PXIe IF Digitizer in digitizer-only mode. It can only be used to control one channel of M9392A or M9202A digitizer at any one time. It is possible to launch multiple running SFPs to control multiple channels concurrently. However, the multichannel trigger capability cannot be controlled by way of the SFP, so the SFP is not very useful when synchronized multichannel operation is required.

#### Configuration Assumptions

- All software is installed – see "[Step 3: Install the Software](#)" on page 11.
- All hardware is installed and cabled – see "[Step 4: Install the Modules](#)" on page 13.

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#### NOTE

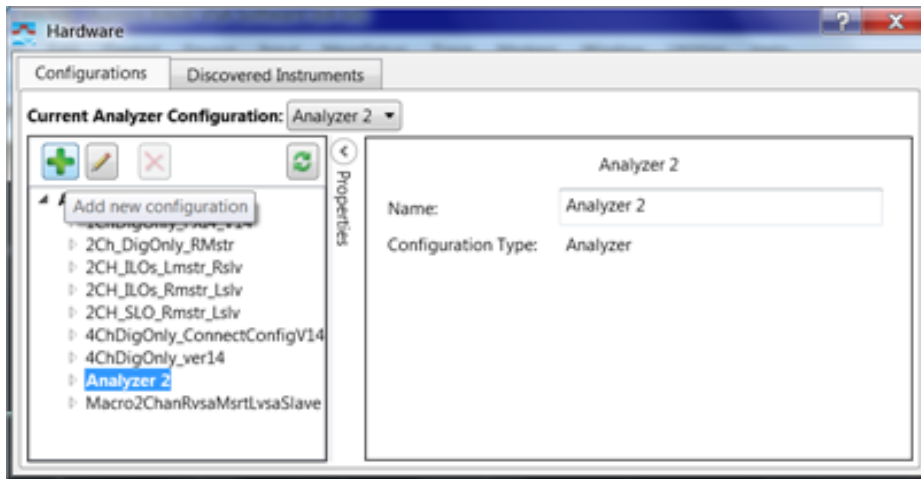
If are using a version of Agilent 89600 VSA software previous to release 15.0, do not use the procedure below. Instead, use the Connection procedure found in the M9392A SFP Help system. Open the help system (**Programs > Agilent > M9392 > M9392 Help**) and navigate to the "Setting Up Multichannel Analysis" topic.

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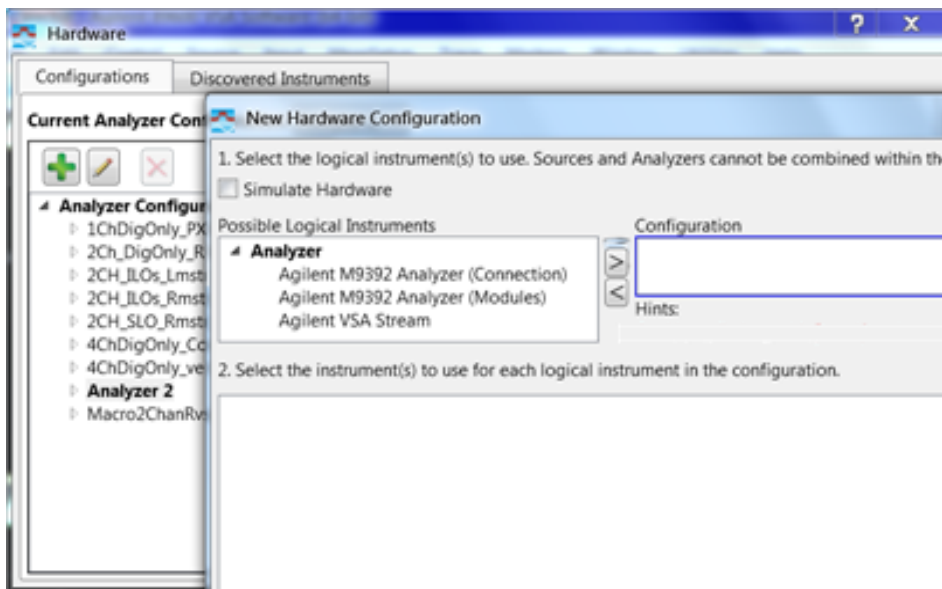
**Configuration with Agilent 89600 VSA Software (Recommended for VSA version 15.0 and later)**


To create a new M9392A instrument using the modules method, use the Agilent 89600 VSA Software and follow these steps:

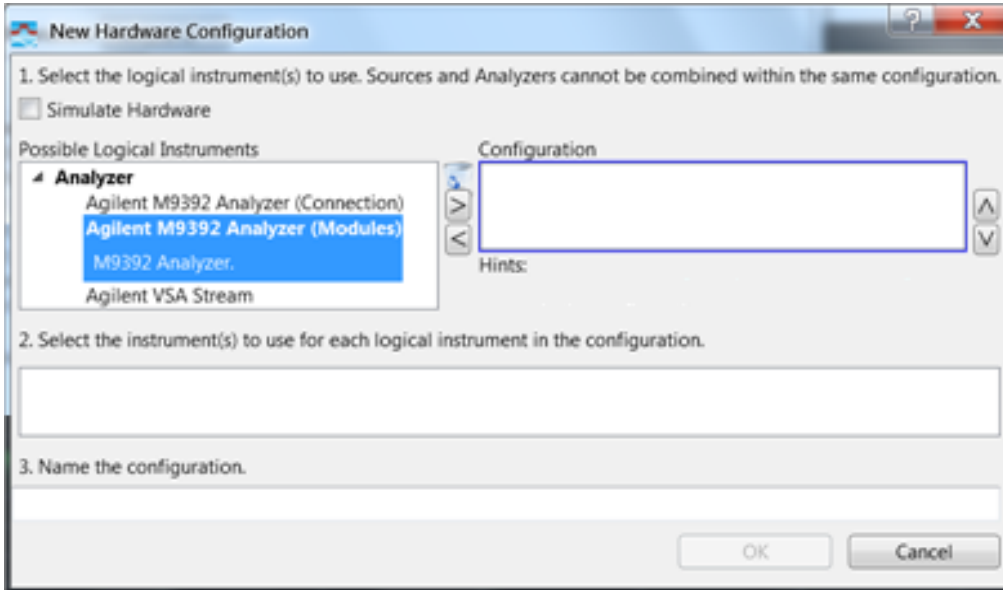
1. Open the "New Hardware Configuration" window in the Agilent 89600 VSA software by selecting: **Utilities > Hardware > Configurations** from the menu bar. When you hover over the last element in this sequence you will see a listing of the relevant configurations. Click on the "Add New Hardware" icon .



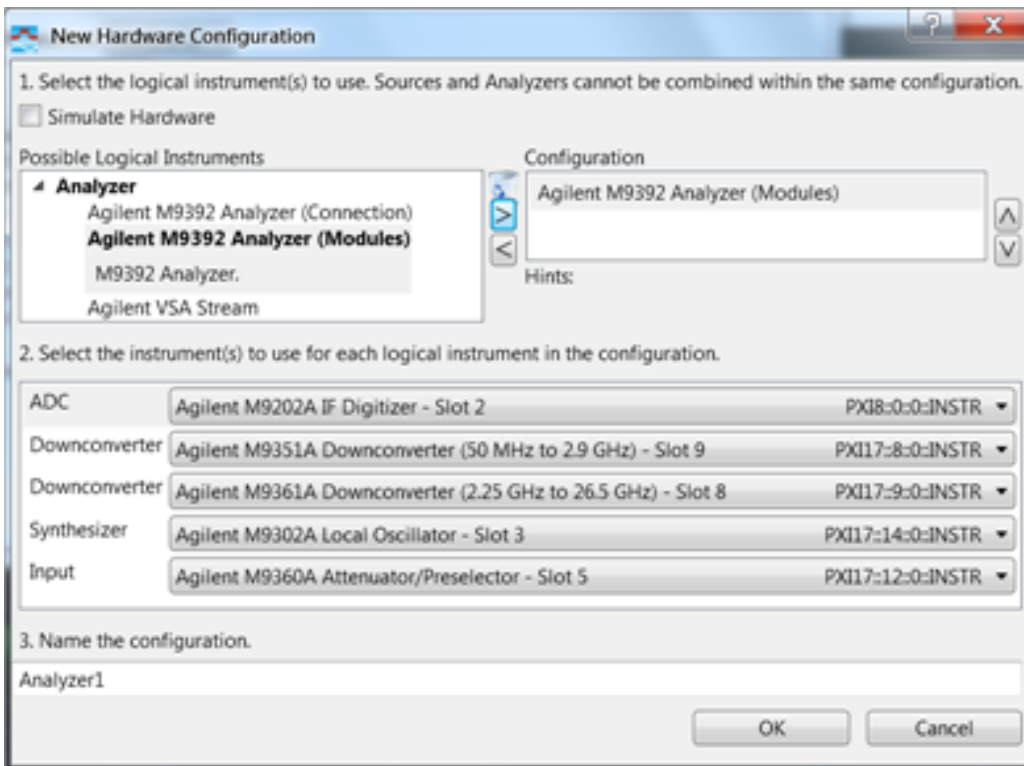
2. In the "New Hardware Configuration" window:



- a. Select the Agilent M9392A Analyzer (Modules) entry and click on the  icon to copy the entry to the "Configuration" window.



- b. Configure the new M9392A (Modules) instrument by selecting the modules identified by their VISA address in the "2. Select the instrument(s) to use for each logical instrument in the configuration" section.




- c. Name the new configuration in the "3. Name the configuration" section. The default name "Analyzer1" may be changed. Use a meaningful name for later identification.
- d. Save the new configuration by selecting the "OK" button.

**NOTE**

For purposes of illustration, the chassis has been populated with two M9392A logical instruments (one in slots 2 through 9 and one in slots 11 through 18. Notice in the figure above, that, by default, the Agilent 89600 VSA software has configured a logical instrument by using the modules in the lowest slot numbers. With this arrangement you can establish two independent-LO logical instruments.

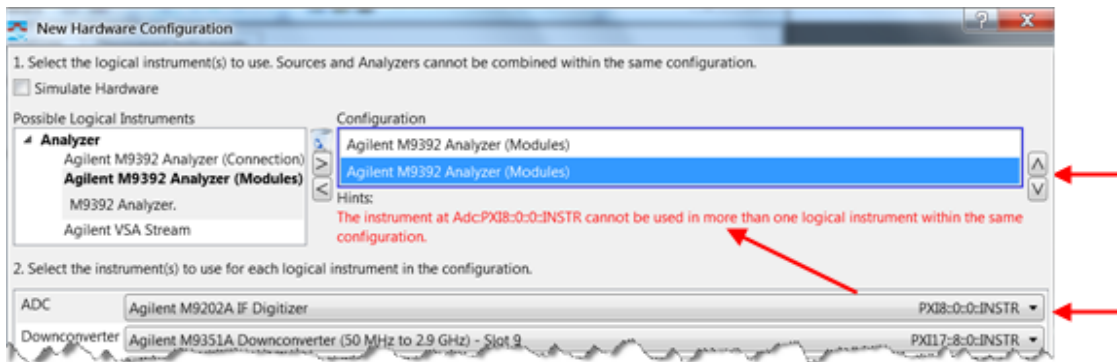
You have now configured one "logical instrument". Follow the rest of this procedure to create a second logical instrument and establish the Master/Slave relationship between the two configurations.

3. From the same "New Hardware Configuration window: select (highlight) "Agilent M9392A Analyzer (Modules)" under "Possible Logical Instruments" and click on the  icon to copy the entry to the "Configuration" window to create a new logical instrument.

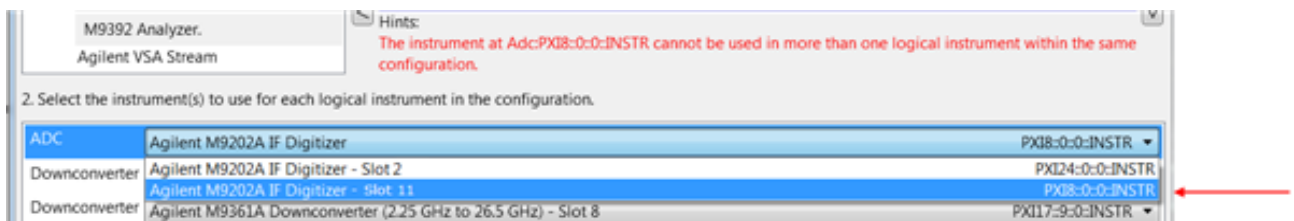
This is now the second entry in the Configuration window and is highlighted. Notice the red Hint in the following figure. Since the VSA software has selected the modules in the lowest numbered (left-most) slots, it appears that the M9202A (Adc) is being used in both configurations.

**NOTE**

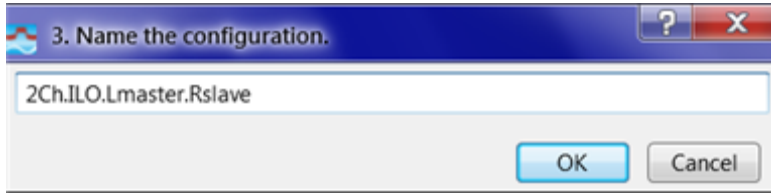
The relative position of the two logical instruments in the Configuration window determines the Master/Slave relationship. The instrument at the top is the master and the one at the bottom is the slave. Use the up/down icons shown below to change this relationship.



4. Click on the Agilent M9202A IF Digitizer dropdown menu (see bottom arrow below). The dropdown displays the slot of both M9202A modules in the chassis. Select the one in Slot 11 at this time. The red "Hint" will persist until you select a module from each of the choices (two downconverters, one synthesizer and one Input) and assign the unused module to complete the second configuration.



5. Name the configuration. Double-click on the "3. Name the configuration dialog and give the two-channel configuration a descriptive name, such as the one shown in the following figure:

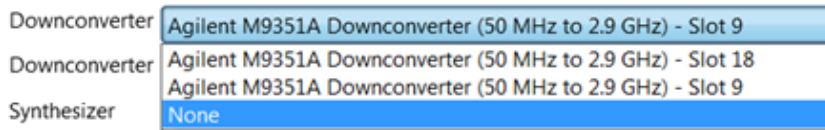


You have now created a two-channel independent LO configuration.

**NOTE**

In step 2 you could have created a shared LO configuration by leaving the Synthesizer (LO) module in the "slave" instrument the same as the LO in the "master" instrument. Remember to use a descriptive name for all configurations.

6. To create a **digitizer-only** logical instrument, you can repeat Step 1 and when presented with the "2. Select the instrument(s) to use for each logical instrument in the configuration" section:
  - a. Select the "Agilent M9202A IF Digitizer" dropdown and make your choice.
  - b. For each of the of the other dropdown choices select None.



- c. When you have configured this digitizer-only logical instrument, Name it appropriately.
7. To create a two-channel digitizer-only configuration, repeat Step 4 and when you have both digitizer-only configurations in the Configuration window, you can establish the Master/Slave relationship.

**Work Processes**

- For more detail about implementing **Multichannel Wideband Analysis** see <http://cp.literature.agilent.com/litweb/pdf/5991-0135EN.pdf>.
- For more detail about implementing **Multichannel Streaming** see <http://cp.literature.agilent.com/litweb/pdf/5991-0221EN.pdf>.
- A comprehensive collection of resources for multichannel PXI analysis is provided at <http://www.agilent.com/find/pxi-vsa-dualchannel>.


# Agilent 89600 Vector Signal Analysis Software

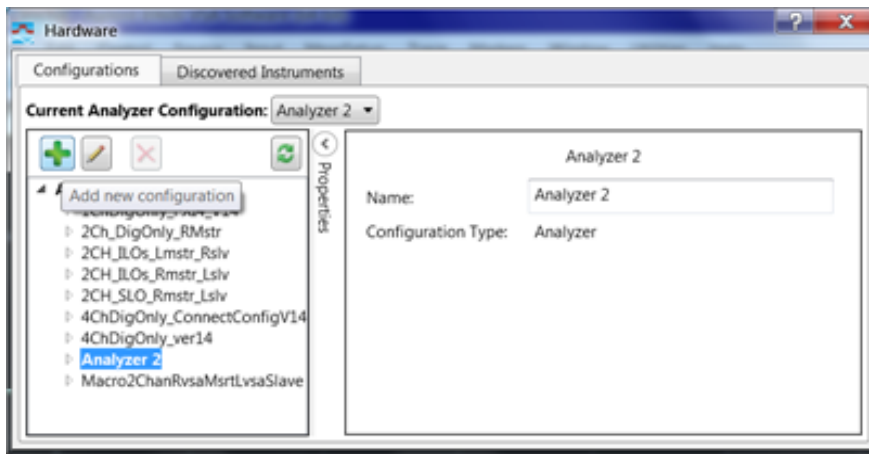
To use the Agilent 89600 Series VSA Software measurement capabilities, you must first create a connection between the software and the hardware configuration that is your M9392A Vector Signal Analyzer. If you are using M9392A instruments in a multi-channel configuration, see [Multichannel Overview](#) (page 40).

## NOTE

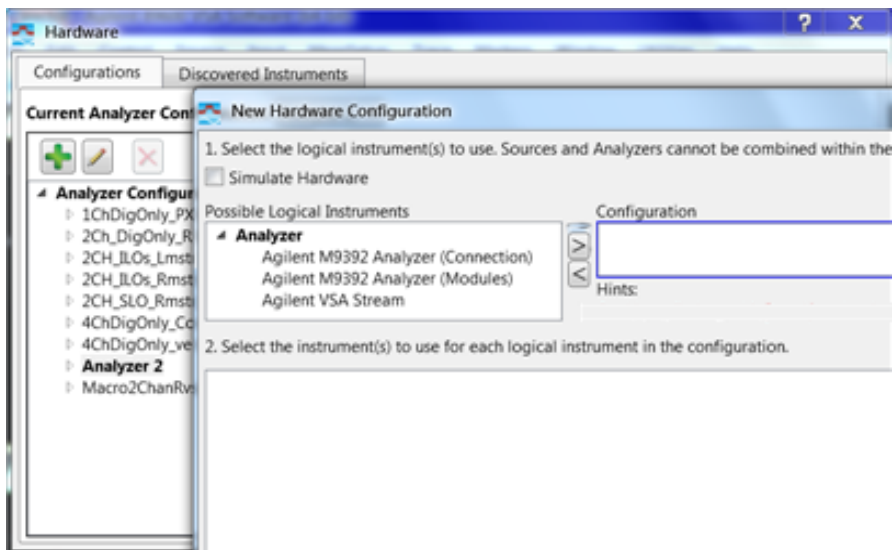
If are using Version 14.2 of Agilent 89600 VSA software, do not use the procedure below. Instead, use the Connection procedure found in the M9392A SFP Help system. Open the help system (**Programs > Agilent > M9392 > M9392 Help**) and navigate to the "Using Measurement Capabilities of the Agilent 89600 Series VSA Software" topic.


To create a new M9392A instrument using the modules method, use the Agilent 89600 VSA Software and follow these steps:

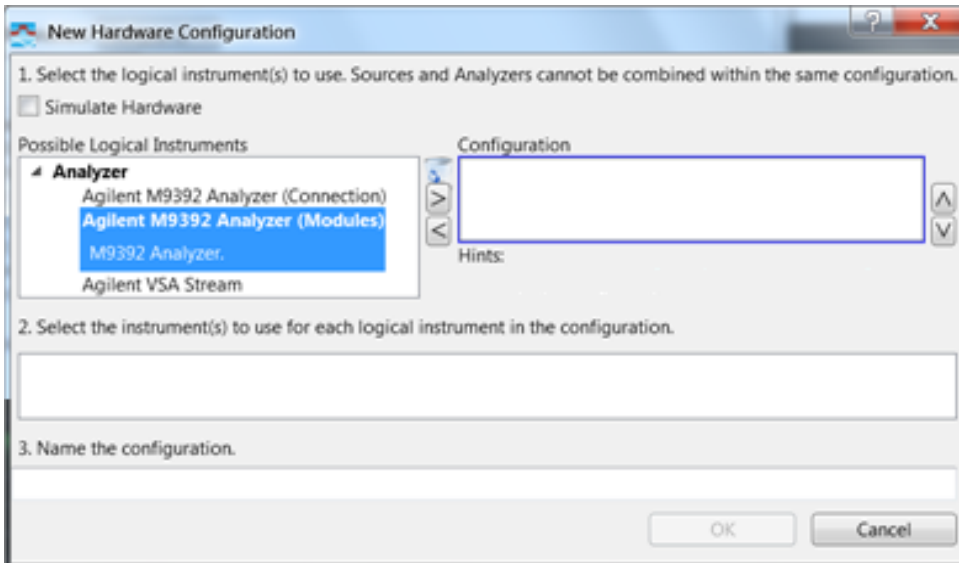
1. Open the "New Hardware Configuration" window in the Agilent 89600 VSA software by selecting: **Utilities > Hardware > Configurations** from the menu bar. When you hover over the last element in this sequence you will see a listing of the relevant configurations. Click on the "Add New Hardware" icon .



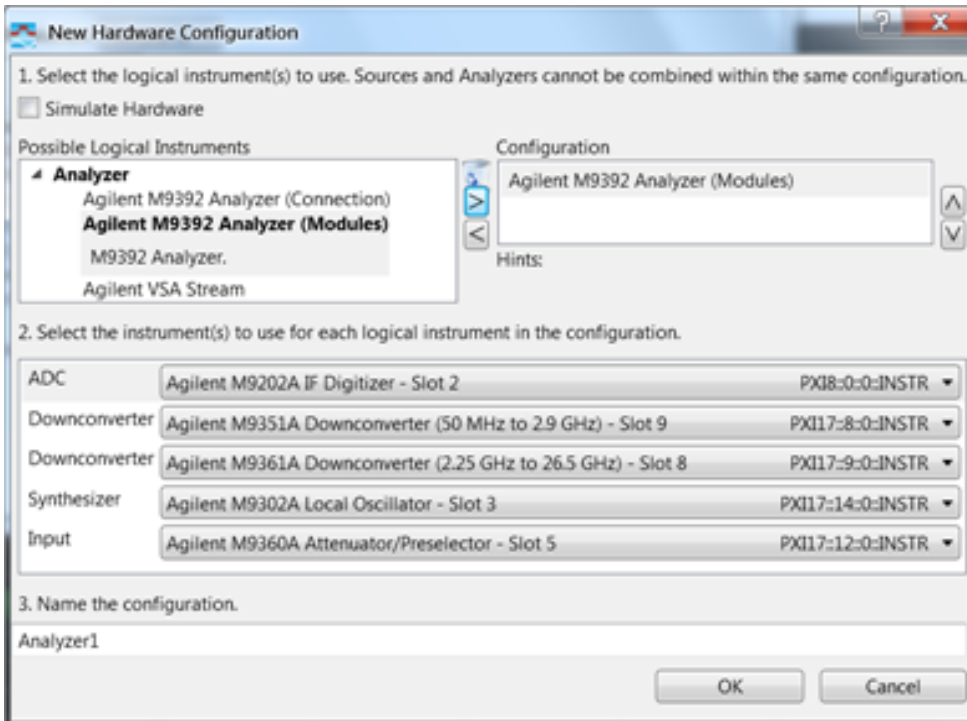
2. In the "New Hardware Configuration" window:



- a. Select the Agilent M9392A Analyzer (Modules) entry and click on the  icon to copy the entry to the "Configuration" window.



- b. Configure the new M9392A (Modules) instrument by selecting the modules identified by their VISA address in the "2. Select the instrument(s) to use for each logical instrument in the configuration" section.



- c. Name the new configuration in the "3. Name the configuration" section. The default name "Analyzer1" may be changed. Use a meaningful name for later identification.
- d. Save the new configuration by selecting the "OK" button.







This information is subject to change without notice.

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