

Agilent M9536A AXIe Embedded Controller

Startup Guide



Agilent Technologies

Notices

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The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

General

Do not use this product in any manner not specified by the manufacturer. The protective features of this product must not be impaired if it is used in a manner specified in the operation instructions.

Before Applying Power

Verify that all safety precautions are taken. Make all connections to the module before applying power. Note the instrument's external markings described under "Safety Symbols".

Ground the Chassis

Agilent chassis are provided with a grounding-type power plug. The instrument chassis and cover must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

Do Not Operate in an Explosive Atmosphere

Do not operate the Agilent module/chassis in the presence of flammable gases or fumes.

Do Not Operate Near Flammable Liquids

Do not operate the Agilent module/chassis in the presence of flammable liquids or near containers of such liquids.

Cleaning

Clean the outside of the Agilent module, chassis, or accessory with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.

Keep away from live circuits

Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged equipment

Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to an Agilent Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.

Do Not Modify the Instrument

Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Agilent Sales and Service Office to ensure that safety features are maintained.

In Case of Damage

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure or practice 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 or practice, 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.

Safety Symbols

Products display the following symbols:



Refer to manual for additional safety information.



Earth Ground.



Chassis Ground.



Alternating Current (AC).



Direct Current (DC).



Indicates that antistatic precautions should be taken.



Notice for European Community: This product complies with the relevant European legal Directives: EMC Directive (2004/108/EC) and Low Voltage Directive (2006/95/EC).



This is the symbol for an Industrial, Scientific, and Medical Group 1 Class A product.



ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001.



N10149

The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This product complies with the WEEE Directive (2002/96/EC) marking requirement. The affixed product label (see below) 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 a “Monitoring and Control instrumentation” product.

Do not dispose in domestic household waste.

To return unwanted products, contact your local Agilent office, or see www.agilent.com/environment/<product> for more information.



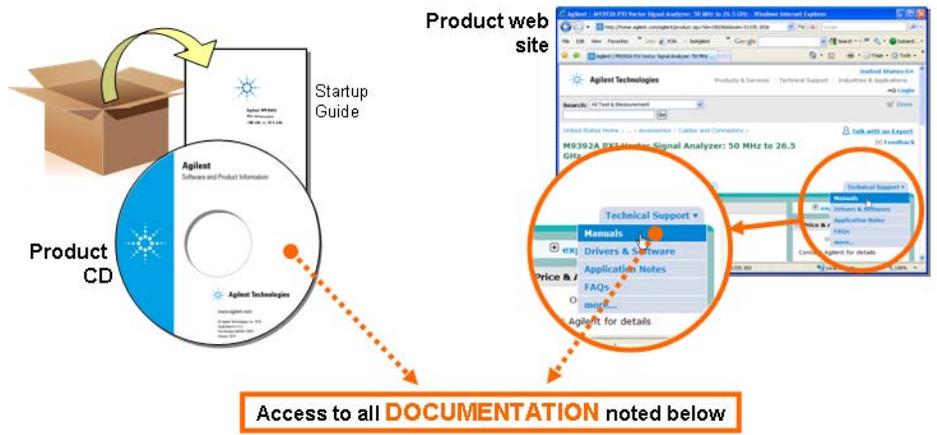
WARNING

This computer contains a lithium-ion battery. There is a risk of fire and chemical burn if the battery pack is handled improperly. Do not disassemble, crush, puncture, short external contacts, dispose of in water or fire, or expose it to temperature higher than 60 °C (140 °F).

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Documentation Map



Startup Guide



- Unpack product
- Verify shipment
- Install software
- Install & connect hardware
- Verify operation

Data Sheet

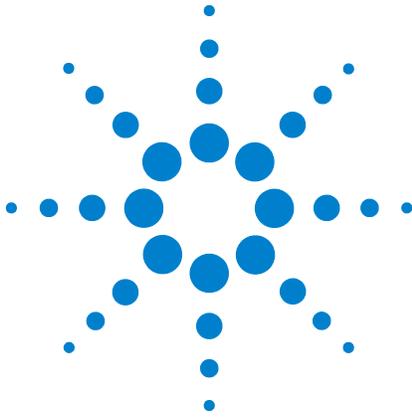


- Product description
- Technical specifications

User Guide



- Setup and configuration
- Operating System
- Basic service including installing additional memory, replacing the hard drive, etc.



Introduction

Agilent's M9536A is a one-slot AXIe compatible embedded PC controller. It can be used to build compact AXIe systems while integrating easily with LXI instruments due to the built-in Gigabit LAN interface. Features include:

- One Intel Xeon EP Quad Core L5518 Processor running at 2.13 GHz
- Gen2 PCI Express link (5.0 GT/s PCI Express) to the AXIe backplane
- 8 GB RAM standard, 16GB RAM optional (up to 24 GB RAM Maximum)*
- 160 GB SATA 2.5 inch, solid state hard drive (SSD).
- Three USB 2.0 ports (type A), two 10/100/1000 BASE-T LAN ports (GbE), one serial COM port, and UXGA port (up to 1600x1200 resolution)
- Preloaded with the Agilent I/O Libraries Suite and your choice of the Microsoft Windows 7 32-bit, 64-bit, or Windows Embedded Standard 7 (WES 7) 32-bit or 64-bit Operating System

Agilent's M9536A is AXIe 1.0 compliant. It does not provide the chassis management functions of an AXIe system module but it does provide application processing power for the chassis. Hence, the controller must be installed in slot #1 of the Agilent M9502A or M9505A AXIe chassis. Agilent's Embedded System Module is required.

Related documentation

Because the Operating System and drivers were installed at the factory and no additional drivers are required, no printed documentation other than this Startup Guide is supplied with the Controller Module.

Adobe Reader is required to view the documentation supplied on the M9536 product information CD. It is available free at: <http://www.adobe.com>. You should install this on your M9536A prior to attempting to open a .PDF file.

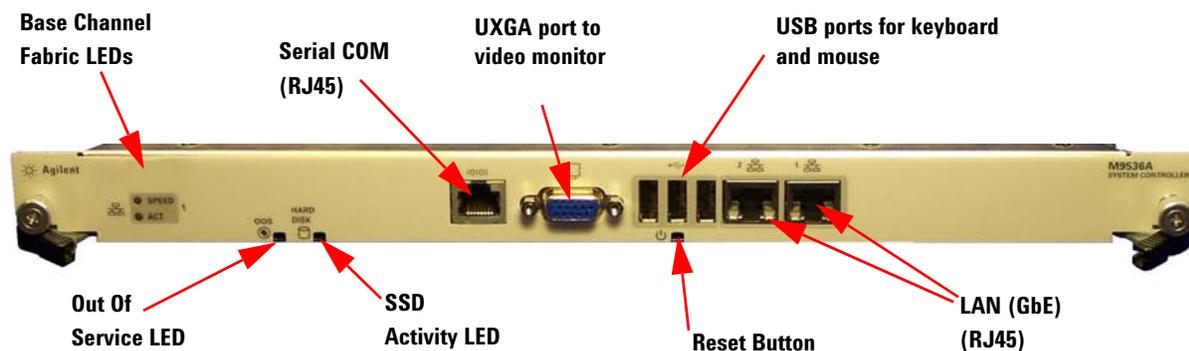
For the latest M9536A specifications, go to: www.agilent.com/find/M9536A.

* The M9536A has three 240-pin, RDIMM sockets which support DDR3-1333 REG/ECC RAM sticks. Each socket can support memory modules up to 8GB for a total memory capacity of 24GB. The standard M9536A configuration is a single 8GB memory stick with a factory option to add a second 8GB memory stick. This leaves an empty socket for future expansion. Note: The capability of addressing 4GB memory is operating system dependent. A 32-bit OS system may not be able to address the full memory space. To use the full 8GB/16GB/24GB memory, a 64-bit OS must be used.



M9536A at a Glance

The following figure shows the front panel for the M9536A. Information about installing the controller and basic use follows in this manual.



Front panel LED definitions

The following tables list the front panel LEDs and a brief description of their use and what they indicate.

Out Of Service (OOS) LED

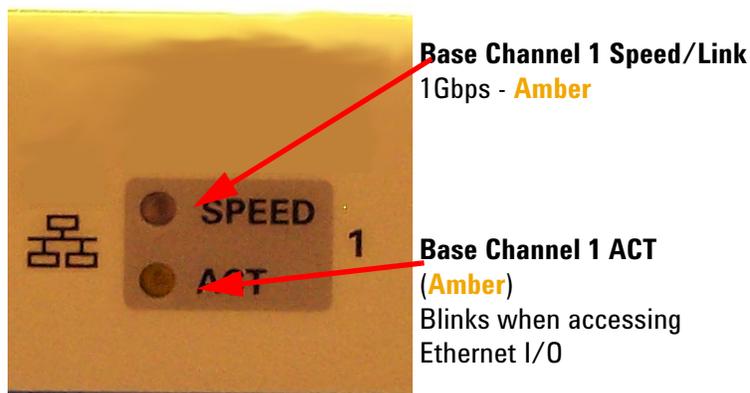
Out of Service LED (Red)	State
Blink	During BIOS POST
Off	BIOS POST OK
On	After Operating System shutdown

Hard Drive (SSD) LED

LED (Amber)	State
Blink/on	During access

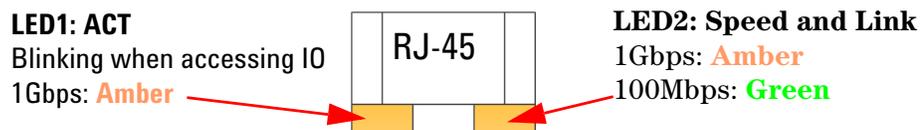
Base channel fabric channel LEDs

These LEDs indicate the LAN activity on the base channel (backplane).



LAN / Gigabit Ethernet (GbE) connector LED

These LEDs indicate activity on the front panel LAN channels.



CAUTION

IMPORTANT: Agilent M9502A or M9505A AXIe chassis must have firmware revision 1.3.23 or later for the M9536A to identify and communicate with other chassis module. Refer to the Agilent chassis web pages for information on updating the chassis firmware.

NOTE

The drivers and Agilent's IO Libraries Suite installed on the M9536A controller are the current versions available when the module shipped from the factory. You should regularly check Agilent's web sites and download the latest drivers and software:

www.agilent.com/find/M9536A for the embedded controller

www.agilent.com/find/iosuite for IO Libraries

Periodically check for the latest AXIe chassis firmware:

www.agilent.com/find/M9502A for the 2-slot AXIe chassis

www.agilent.com/find/M9505A for the 5-slot AXIe chassis

For example, Agilent's AXIe chassis firmware version 1.3.23 (and later) provides for enhanced fan control and E-Keying that was not supported in earlier chassis firmware versions.

Step 1: Unpack and Inspect the Module

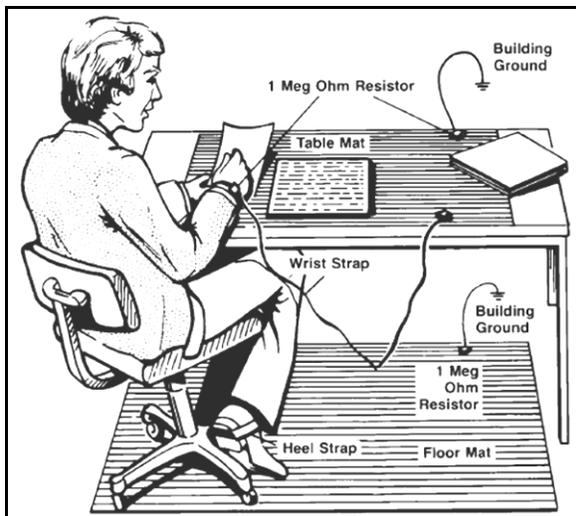
CAUTION

Agilent's AXIe Modules are shipped in materials that prevent static electricity damage. 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. All work on electronic assemblies should be performed at a static-safe work station. The following figure shows an example of a static-safe work station using two types of ESD protection. Purchase acceptable ESD accessories from your local supplier.

- Conductive table-mat and wrist-strap combination.
- Conductive floor-mat and heel-strap combination.



Both methods, 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 M Ω of isolation from ground.

Inspect for damage

After unpacking the controller module, carefully inspect it for any shipping damage. Report any damage to the shipping agent immediately, as such damage is not covered by the warranty.

CAUTION

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

NOTE

Information on preventing damage to your Agilent equipment can be found at www.agilent.com/find/tips.

If you need to return the module for service

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

- 1 Review the warranty information shipped with your product.
- 2 Contact Agilent to obtain a return authorization and return address. If you need assistance finding Agilent contact information go to 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/M9536A.
- 3 Write the following information on a tag and attach it to the malfunctioning equipment.
 - Name and address of owner. A Post Office box is not acceptable as a return address.
 - Product model number (for example, M9536A)
 - Product serial number (for example, TWxxxxxxxx). The serial number label is located on the side of the module.
 - A description of failure or service required.
- 4 Carefully pack the module in its original ESD bag and carton. If the original carton is not available, use bubble wrap or packing peanuts, place the instrument in a sealed container and mark the container “FRAGILE”.
- 5 On the shipping label, write ATTENTION REPAIR DEPARTMENT and the service order number (if known).

NOTE

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

Step 2: Verify Shipment Contents

Your shipment should have included the following:

- The Agilent M9536A module that you ordered.
- This document (Agilent M9536A AXIe Embedded Controller Startup Guide).
- An *Automation-Ready CD with Agilent IO Libraries Suite*.
- An *M9536A Product Information CD*. This CD contains the *M9536A User Guide* which provides detailed information about the module, configuration, etc.
- Any other accessories that you ordered (cables, connectors, etc.).
- Note, a keyboard, mouse, video monitor are not included with the M9536A

The operating system has been installed for you at the factory.

NOTE

Agilent IO Libraries version (the latest version available at the time of shipment) is pre-installed on the controller. It must be installed prior to installing and running any application software. The latest version can be downloaded from: www.agilent.com/find/iosuite.

No other drivers are required to operate the controller module. However, your application modules may require drivers. If possible, you should connect the controller module to the internet and download drivers from the original source. Alternately, you can install the drivers on a USB memory stick and install them accordingly.

Step 3: Install the M9536A Embedded Controller

The Agilent M9536A has been designed for easy installation. However, the following standard precautions, installation procedures, and general information must be observed to ensure proper installation and to prevent damage to the board, other system components, or injury to personnel.

Follow these steps to install the M9536A Embedded Controller in the AXIe chassis.

- 1 Ensure the AXIe chassis is turned off. The chassis should be plugged into an AC power source. The AC power cord grounds the chassis and protects it from electrical damage while modules are installed.
- 2 Extend and pull out on the controller's ejector/injector handles.

NOTE

Embedded controllers, such as the M9536A, should be installed in Slot 1 of the AXIe chassis. Failure to locate the controller in Slot 1 will cause the controller to not enumerate the AXIe chassis PCIe devices.

- 3 Carefully align the M9536A board edges with the chassis guide rails and insert the controller into the chassis guide rails.
- 4 Check that the catch hooks and alignment pins at both ends of the module are correctly inserted into the proper chassis holes. Push inward on the handles until the module is firmly seated in the chassis. (Do not force the handles if there is resistance; this may damage the connectors and/or backplane.)
- 5 Collapse the insertion/extraction handles against the module faceplate.
- 6 Tighten the captive retaining screws at both ends of the module
- 7 Connect other peripherals (such as the USB keyboard and mouse, VGA monitor, LAN cable for remote access, etc.) to the embedded controller front panel. See the graphic on the next page.
- 8 Plug in and power up the AXIe chassis. Verify that the chassis fans are operating and free of obstructions that may restrict air flow.

NOTE

Refer to the instructions provided with your AXIe Chassis for chassis power up / power down instructions.

CAUTION

IMPORTANT: Agilent M9502A or M9505A AXIe chassis **must** have firmware revision 1.3.23 or later for the M9536A to identify and communicate with other chassis module. Refer to the Agilent chassis web pages for information on updating the chassis firmware.

CAUTION

The M9536A module is powered and connects to the Embedded System Module (ESM) through the chassis backplane. With the M9536A installed, do not connect an external host PC to the ESM module PCIe connector.



Removing the M9536A from the chassis

To remove the M9536A controller, reverse the previous procedure. Execute the Windows shut down process on the controller first. Then power down the chassis. Loosen the captive screws, extend and pull outwards on the extraction handles to release the module from the backplane. Pull the module towards you until it is free of the chassis.

CAUTION

Exercise care when handling the board as the heat sink can get very hot. Do not touch the heat sink when installing or removing the board. The board should not be placed on any surface or in any form of storage container until the board and heat sink have cooled down to room temperature.

Power on sequence

The controller will boot with the operating system installed. Allow the controller to run through its startup screens and start the operating system. For detailed power on sequence and configuration information, refer to the *M9536A User Guide* on the *M9536A Product Information* CD.

CAUTION

Possible Operating System Damage: DO NOT interrupt or power-down the controller during the FIRST boot of the operating system. Interrupting this FIRST boot will damage the operating system image. Be sure to wait until the boot is complete and the Windows operating system start window is displayed, and then shut down or restart Windows (click **Start > Shut down** or **Start > Restart**); this will ensure all configuration files have been saved. Subsequent boots will then be ready for normal operation.

Power-off sequence.

As with any PC, Windows-based instruments should not be shutdown by either removing the power via an external power source or by pulling the power plug out from the rear panel. This could corrupt the operating system. The only approved way to shut down the controller is to execute the Windows shutdown process and then turn off the chassis via the chassis On/Off button.

CAUTION

Pressing the chassis power button on an M9502A or M9505A chassis immediately removes power from the controller. This may cause loss of data or damage to the controller.

Power Down Modes

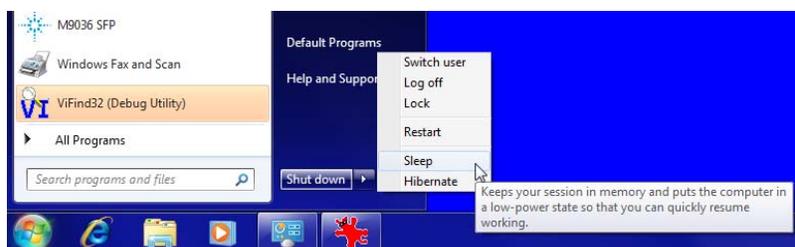
Agilent's M9536A defaults to the Windows High Performance Power Plan. This plan does not allow the controller display to shut off or the controller to enter a sleep mode.

NOTE

Do not enable the Microsoft Windows sleep mode. It is possible that the M9536A controller could go into sleep mode while it is running a user test program. The controller may not have proper chassis enumeration when it wakes up.

If you have a USB keyboard with a Sleep button (sometimes this is a key with a moon logo), do not use it.

Do not use the Sleep or Hibernate modes from the Startup Button as shown in the following graphic.



Microsoft Windows Activation

Agilent ensures that your copy of Windows 7 is activated at the time it ships from the factory. However, the first time you install and turn on the M9536A and Windows 7 starts, you must accept the End User License Agreement (EULA). For information about Windows 7 EULA, go to www.microsoft.com.

To verify Windows Activation, do the following:

- 1 Open the System by clicking the Windows **Start** button. Click **Control Panel**, then **System and Maintenance**, and then click **System**.
- 2 Scroll down to the bottom of the screen. Under **Windows Activation**, you can view the activation status.

CAUTION

By Agilent's agreement with Microsoft, Windows Automatic Update is turned off at installation. You may choose to turn Windows Automatic Update on after starting the operating system. However, Agilent cannot be held responsible for changes to the system caused by the automatic update process. It is possible for automatic updates to cause unexpected behavior in the system.

NOTE

Make certain the **caps lock** and **num lock** keys are off when entering passwords (especially for the first time). It is possible for these keys to be on when the controller powers on.

Controller Operating System

Your M9536A comes with the Microsoft Windows 7 32-Bit or 64-Bit, or the WES 7 32-bit or 64-bit operating system preinstalled along with the Agilent IO Libraries Suite. This section provides some general system configuration and preventative maintenance procedures that you, the customer, are responsible for. In general, the M9536A operates as any other PC, including remote desktop access.

The Windows operating system supplied with your M9536A is licensed for use on the SSD mounted to the controller. If the SSD is replaced, you may be responsible to purchase or relicense the operating system.

Windows Security

If your system is connected to the internet, you should take the following steps to ensure the operating system is protected:

- Use an internet firewall
- Get the latest Windows updates
- Install and use up-to-date antivirus software.

To check the status of, or make changes to, the security settings for your controller, open the Windows Security Center (Start > Control Panel > Security Center).

The default system setting is to not automatically check for critical Windows updates and notify you, if the controller has internet access. You can change the configuration of the Microsoft Automatic Updates to notify you of updates, in which case you would need to manually update windows operating system by accessing Internet Explorer and from the Tools menu, select Windows Update.

NOTE

Downloading and installing Windows Updates can be network and CPU intensive (impacting system performance) and some Windows Updates automatically reboot the controller. Therefore, Windows updates should be performed when the system is not in normal use.

NOTE

There is no antivirus or spyware software included with your controller. Antivirus application software is the customer's responsibility. Having antivirus software installed may have a slight impact on system performance if your system uses intensive network data transfer.

User data backup

All user data should be regularly backed up to an external memory device. This can be done across a network or to a USB device. Your IT department may already have a backup strategy which is suitable for the system and data. Also, user data back up should be done just prior to sending the controller back to Agilent for service.

Create a System Repair disc

If you are unable to boot the M9536A, you may need to use a System Repair disc. You are responsible to create this disk. Refer to the M9536A User Guide for additional information.

NOTE

You will need a separate USB CD/DVD ROM drive to create and use the System Repair disc.

Create a System Image

You should create a System Image as a backup in case you ever need to reinstall the operating system. You should regularly create a system image so that all data, applications, etc. have backups.

Use the Windows Backup tool to create a backup system image on an external (USB) hard drive. To start the backup, click on the **Windows Start** button, then type “**Back Up**” in the search field. Select the “**Back up your Computer**” link then click on the “**Create a system image**” link. Refer to the M9536A User Guide for detailed information on system back up including instructions to unhide the Agilent Recovery Partition.

There is a small system partition for the Agilent Recovery System on the SSD. During the boot process, you are given the choice to boot the operating system normally or boot from the recovery partition.

NOTE

Some third-party disk backup utilities may destroy the Agilent backup partition. If this happens, the Agilent Recovery System will not work. Refer to the section entitled *Create a System Image* in the M9536A User Guide for detailed information on system back up including instructions to unhide the Agilent Recovery Partition.

Step 4: Run Agilent IO Libraries Suite

Agilent IO Libraries Suite was installed at the factory in your embedded controller. If you need to re-install it or want to update to a later version, follow the instructions below. IO Libraries Suite is required for the AXIe modules. It includes the Agilent Connection Expert, the IVI Shared Components, and the VISA Shared Components.

NOTE

The Agilent IO Libraries version available at time of shipment was pre-installed on the controller. It must be installed prior to installing and running any application software. You should regularly check for, download and install the latest version. The latest version can be downloaded from: www.agilent.com/find/iosuite.

NOTE

Agilent IO Libraries installs the **IVI Shared Components** and **VISA Shared Components** on your PC.

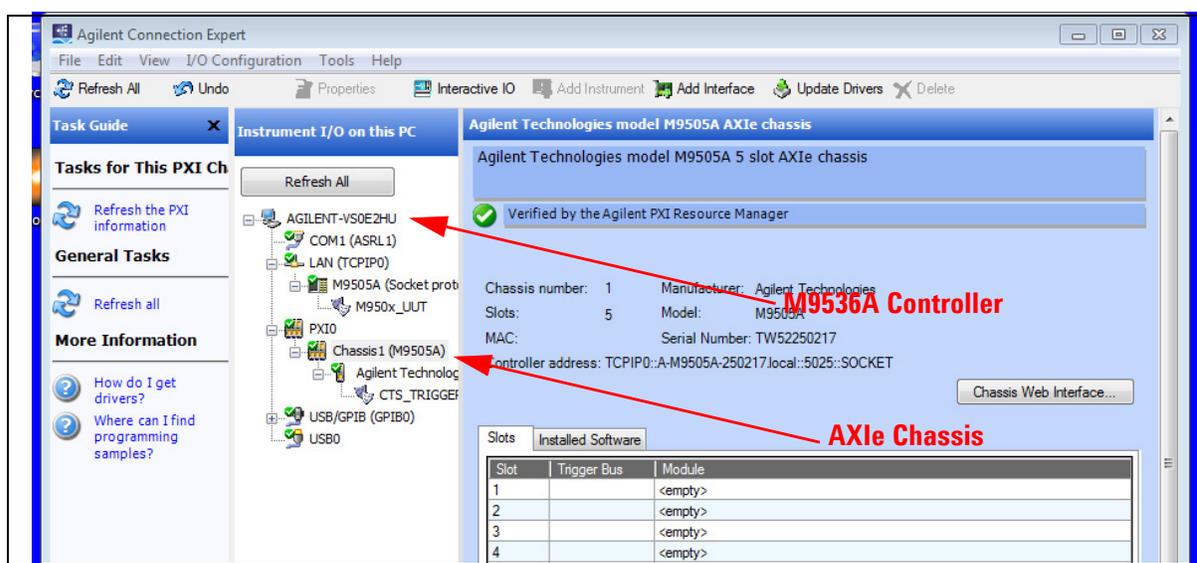
If Connection Expert is not already running, run it now to verify your I/O configuration. From the Windows Start button, click the IO Libraries icon () or from the Task bar, click the **Agilent Connection Expert** icon () (earlier versions of IO Libraries used a different icon).

Step 5. Verify Operation

Locate your interfaces and instruments in the Agilent Connection Expert Explorer Pane. The following graphic shows the Connection Expert screen (using Agilent IO Libraries version 16.3 Update 1) and shows how an AXIe chassis appears under the PXI0 tree.

NOTE

With Agilent IO Libraries 16.2 (and later versions) Agilent Connection Expert should automatically identify the AXIe chassis. With Agilent IO Libraries version 16.1, you may need to start Connection Expert, then power down the controller and chassis and reboot them in order for Connection Expert to identify the AXIe chassis.



Refer to the Agilent IO Libraries Suite documentation and the M9536A User Guide for information on using the IO Libraries.

Step 5. Verify Operation

There are no actual verification procedures for the M9536A Embedded Controller. If it boots properly, then the controller is working normally.

However, from Agilent Connection Expert (see Step 4 above), you can access the M9502A/M9505A Chassis Web page and from there you can find the M9536A version information and sensor diagnostic information. For detailed instructions, refer to the M9536A User Guide.

Step 6: Install User Application Modules in the AXIe Chassis

The AXIe chassis accepts modules conforming to the AXIe standard, which can usually be installed in any available slot in the chassis. These may include:

- AXIe instrument or instrument hub modules
- AXIe embedded controller module (must be installed in chassis slot 1)
- AXIe filler panel modules

The insertion and removal procedures are the same for the 2-slot and 5-slot chassis, and for all module types except filler panels.

NOTE

Periodically check for the latest AXIe chassis firmware:

www.agilent.com/find/M9502A or www.agilent.com/find/M9505A

For example, Agilent's AXIe chassis firmware version 1.3.23 (and later) provides for enhanced fan control and E-Keying that was not supported in earlier chassis firmware versions.

CAUTION

Static Electricity—The components and connectors on modules are sensitive to static electricity. To minimize electrostatic damage, take the necessary anti-static precautions. Both chassis provide a grounding terminal, to which you can connect a wrist strap.

Empty Slots—Except for performing initial chassis verification or troubleshooting, do not operate the chassis with uncovered empty slots. Always insert a filler panel module or instrument module into empty slots. This is especially important for the slots on either side of an instrument module. This allows proper air flow and cooling, and provides EMI shielding for the chassis and installed components. Leaving empty slots uncovered can increase fan speed, raise ambient noise, overheat components, and shut down modules.

ESM—The Embedded System Manager (ESM) Module is integral to the operation of the AXIe chassis. Except for troubleshooting purposes, do not remove the ESM.

Hot Swap—AXIe does not explicitly support hot swap for instrument modules. Agilent recommends fully powering down and unplugging the chassis before installing or removing modules

AXIe chassis are shipped with filler panel modules on all but Slot 1; you may need to remove filler panels from covered slots.

CAUTION

Certain modules require bus master and/or Rear I/O capability. If you are in doubt whether such features are required for the board you intend to install, please check your specific board and/or system documentation to make sure that your system is provided with an appropriate free slot in which to insert the board.

Install application module drivers (if necessary)

Each installed application module will typically require device drivers and control software. You need not install them to verify basic chassis operation, but would logically install them on the host PC at this time. For others, consult the module provider for software requirements and instructions.

NOTE

You may need to connect the embedded controller to the internet. Locate and install the necessary drivers from the internet.

Chassis shutdown

As with any PC, Windows-based instruments should never be shutdown by either turning off the power via an external power source or by pulling the power plug out from the rear panel. This could corrupt the operating system. The only approved way to shut down the controller is to execute the Windows shutdown process. After Windows has completely shutdown (indicated by no activity on the hard disk drive light), then turn off the chassis via the chassis On/Off button.

Environmental Operating Conditions

The Agilent M9536A AXIe Embedded Controller is designed to operate in a temperature range of 0°C to +50°C with non-condensing humidity. The maximum humidity is 95% at +40 °C. The maximum operating altitude is 3000 m (9800 ft). The module should be operated in an indoor environment where temperature and humidity are controlled. Condensation can pose a potential shock hazard.

Condensation can occur when the module is moved from a cold to a warm environment, or if the temperature and/or humidity of the environment change quickly.

Samples of this product have been type tested in accordance with the Agilent Environmental Test Manual and verified to be robust against the environmental stresses of storage, transportation and end-use. Those

stresses include but are not limited to temperature, humidity, shock, vibration, altitude and power line conditions. For complete specifications, check the Agilent web site at: www.agilent.com/find/M9536A.

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