

Keysight M9037A PXIe Embedded Controller



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Manual Part Number

M9037-90001

Edition

Third Edition, September 2014
Printed in Malaysia

Keysight Technologies, Inc.
1400 Fountaingrove Parkway
Santa Rosa, CA 95403 USA

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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. Keysight 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 unit before applying power. Note the external markings described under "Safety Symbols".

Ground the Instrument

Keysight 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 module/chassis in the presence of flammable gases or fumes.

Do Not Operate Near Flammable Liquids

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

Cleaning

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

Do Not Remove Instrument Cover

Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.

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 Keysight Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.

DO NOT block the primary disconnect

The primary disconnect device is the appliance connector/power cord when a chassis used by itself, but when installed into a rack or system the disconnect may be impaired and must be considered part of the installation.

Do Not Modify the Instrument

Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Keysight 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

Do NOT block vents and fan exhaust: To ensure adequate cooling and ventilation, leave a gap of at least 50mm (2") around vent holes on both sides of the chassis.

Do NOT operate with empty slots: To ensure proper cooling and avoid damaging equipment, fill each empty slot with an AXle filler panel module.

Do NOT stack free-standing chassis: Stacked chassis should be rack-mounted.

All modules are grounded through the chassis: During installation, tighten each module's retaining screws to secure the module to the chassis and to make the ground connection.

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 lifespan, 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 the chassis.

Safety Symbols








CAUTION

A CAUTION 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 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.

Products display the following symbols:

-  Warning, risk of electric shock
-  Refer to manual for additional safety information.
-  Earth Ground.
-  Chassis Ground.
-  Alternating Current (AC).
-  Standby Power. Unit is not completely disconnected from AC mains when switch is in standby.
-  Antistatic precautions should be taken.
- CAT I IEC Measurement Category I, II, III, or IV
- CAT II
- CAT III
- CAT IV

For localized Safety Warnings, Refer to Keysight Safety document (p/n 9320-6792).



The CSA mark is a registered trademark of the Canadian Standards Association and indicates compliance to the standards laid out by them. Refer to the product Declaration of Conformity for details.



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).



The Regulatory Compliance Mark (RCM) mark is a registered trademark. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.

ICES/NMB-001

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



This symbol represents 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 this product.



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.

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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.

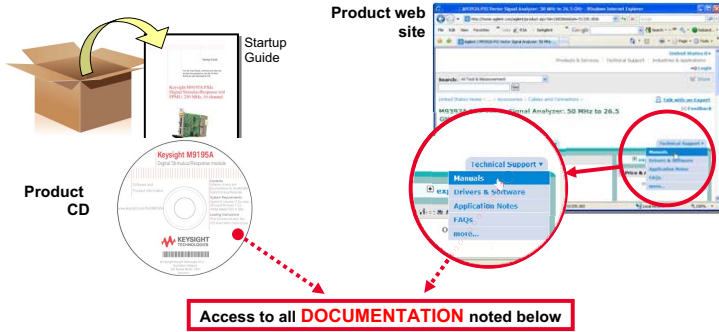
To return unwanted products, contact your local Keysight office, or see www.keysight.com/environment/product for more information.



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<p>LabVIEW</p> <p>Context Help with link to detailed VI information</p>	<p>LabVIEW Driver help system</p> <ul style="list-style-type: none"> • LabVIEW driver programmer's reference
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M9037A PXIe Embedded Controller Startup Guide

Introduction

Keysight's M9037A is a 3U, 4-slot PXIe Embedded Controller providing:

- Intel Haswell Core™ i7-4700EQ quad-core, 2.4 GHz processor
- 4 GB standard (or optional 8 or 16 GB) 1600 MHz DDR3 Memory*
- 240 GB SATA 2.5 inch solid state drive (SSD) front panel removable
- Integrated IO on the front panel includes two Gigabit Ethernet ports, four USB 2.0 ports†, two USB 3.0 ports, GPIB connector, two DisplayPort video ports (also known as DisplayPort++), one PCIe x8 connector
- Front Panel SMB Trigger Connector used to route an external trigger signal (TTL level) to/from the PXI backplane with software trigger
- Preloaded with Keysight IO Libraries and your choice of either Microsoft Windows Embedded Standard 7 (WES7) 32-bit or 64-bit Operating System
- Pre-installed IVI drivers for the Keysight M9018A 18-slot PXIe chassis

Related Documentation

A Windows Embedded Standard 7 (WES7) Operating System and all M9037A drivers were installed at the factory, no additional drivers are required. This Startup Guide and an M9037A User Guide are also found on the Product Information CD supplied with the controller.

Complete M9037A documentation, as well as the M9018A PXIe chassis documentation, is available preinstalled on the M9037A SSD. From the Windows **Start** button, select **All Programs > Keysight > M9037A** or **M9018A**.

Adobe Reader is required to view the documentation supplied on the M9037A and product CD. It is available free at: <http://www.adobe.com>. You should install this on your M9037A prior to attempting to open a .PDF file.

For the latest M9037A specifications, go to: www.keysight.com/find/M9037A.

For the IVI trigger driver, help file, program examples, etc. go to:

```
C:\ProgramFiles\IVI Foundation\IVI\Drivers\AgPxiPc or  
C:\ProgramFiles x86\IVI Foundation\IVI\Drivers\AgPxiPc
```

For the Soft Front Panel interface: from the Window's Start menu, select:

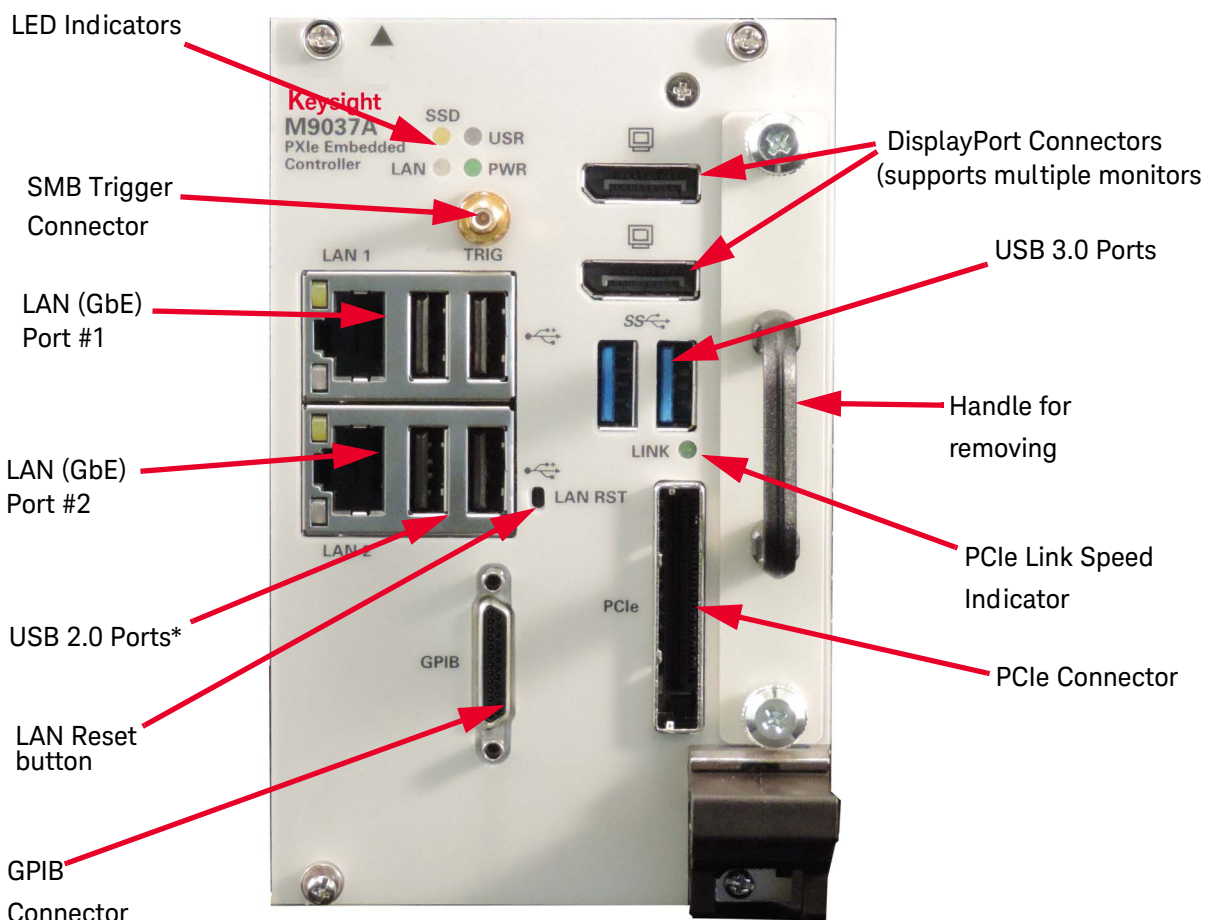
```
Start > All Programs > Keysight > PXIe Embedded Controller >  
Embedded Controller SFP
```

* The M9037A has two 240-pin, RDIMM sockets that support DDR3-1600 REG/ECC RAM sticks. The standard M9037A configuration is a single 4 GB memory module with a factory option to provide either 8 or 16 GB memory. A 32-bit OS system may not be able to address 4GB memory space. To use the full 16GB memory, a 64-bit OS must be used. The M9037A can address up to 32 GB total memory.

† The USB 2.0 and 3.0 ports do not support the USB Battery Charging specification. Do not connect non-standard or defective USB devices

M9037A at a Glance

The following figure shows the front panel for the M9037A. Detailed information about the module follows in this manual.



* The USB 2.0 and 3.0 ports do not support the USB Battery Charging specification. Do not connect non-standard or defective USB devices.

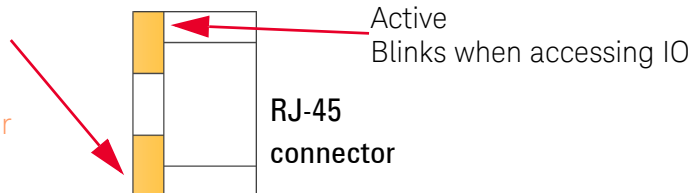
Front panel LED indicators

The following table lists the LEDs on the front panel and a brief description of their use and what they indicate.

LED Indicator	Color	Description
PWR	Green	If the LED is on, the power supply to the controller is good and the system should boot.
SSD	Amber	When the Solid State Drive (SSD) is active, the LED will flash.
LAN	N/A	These two LEDs and the LAN RST switch are reserved for Keysight use only. The LEDs should never turn on or flash. Depressing the LAN RST switch has no effect.
USB	N/A	
PCIe Link	Green	Indicates PCIe Link Status: Off = no link; blinking @ 1 Hz rate = Gen1 speed blinking @ 2 Hz = Gen2 speed LED on steady = Gen3 speed

Gigabit Ethernet (GbE) LEDs

Speed and Link
10Mbps: off
100Mbps: Green
1000Mbps: Amber



Status	Speed LED (Green/Amber)	Activity LED (Yellow)
Network link is not established or system is powered off	OFF	OFF
10 Mbps	Link	Off
	Active	Off
100 Mbps	Link	Green
	Active	Green
1000 Mbps	Link	Amber
	Active	Amber

LAN RST Switch

The LAN RST switch is reserved for Keysight use only. Depressing the LAN RST switch has no effect.

Step 1: Unpack and Inspect the Module

CAUTION

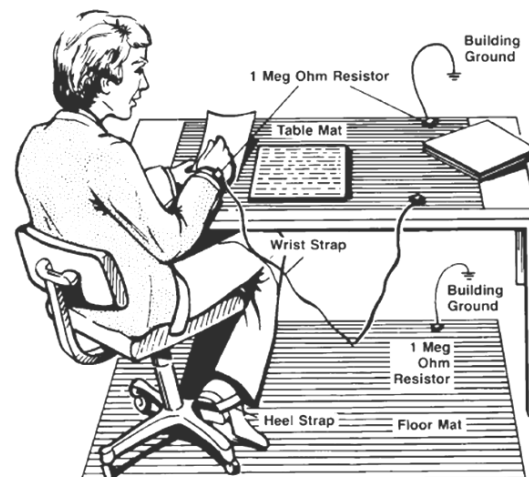
Keysight's PXIe Modules are shipped in materials that prevent static electricity damage. The modules should only be removed from the packaging in an anti-static area ensuring that correct anti-static precautions are taken. Store all modules in anti-static envelopes when not in use.

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 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 M Ω of isolation from ground.



Inspect for damage

After unpacking the embedded controller, 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 Keysight equipment can be found at www.keysight.com/find/tips.

Step 1: Unpack and Inspect the Module

If you need to return the module for service

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

- 1 Review the warranty information shipped with your product.
- 2 Contact Keysight to obtain a return authorization and return address. If you need assistance finding Keysight contact information go to www.keysight.com/find/assist (worldwide contact information for repair and service) or refer to the **Support** information on the product web page at: www.keysight.com/find/M9037A.
- 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, M9037A)
 - 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 You should remove the SSD and RAM modules prior to returning the M9037A for service. Refer to the M9037A User Guide for detailed instructions. The service center has its own SSD and RAM modules for testing purposes
- 5 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".
- 6 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 Keysight M9037A Embedded Controller module that you ordered.
- This printed manual (M9037A PXIe Embedded Controller Startup Guide).
- An *Automation-Ready CD with Keysight IO Libraries Suite* (version 16.3 or later). (IO Libraries was installed at the factory)
- An *M9037A Product Information CD with User Guide and specifications*. Adobe Reader is required (<http://www.adobe.com>)

The operating system of your choice, either Microsoft Windows Embedded Standard 7 (WES7) 32-bit or 64-bit, the latest version of Keysight IO Libraries Suite, and all necessary driver software were installed for you at the factory.

NOTE

The most current version of Keysight IO Libraries is required prior to installing and running any other software. The latest version can be downloaded from: www.keysight.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 M9037A to the internet and download drivers from the original source. Alternately, you can transfer the drivers on a USB memory stick and install them accordingly.

NOTE

A GPIB cable is NOT supplied with the controller. Note that the GPIB cable is a standard micro type 2 GPIB cable with standard pin wiring and is not compatible with the M9036A Embedded Controller GP-IB cable. It is available from Keysight as an accessory cable, part number Y1260A.

Step 3: Install the M9037A Embedded Controller

The Keysight M9037A 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.

Keysight's M9037A can operate with all of the PCIe fabric configurations found on the M9018A chassis as well as the standard 4x4 fabric used on non-Keysight PXIe chassis.

CAUTION

The following safety precautions must be observed when installing or operating the Keysight M9037A. Exercise care when handling the module as the heat sink can get very hot. Do not touch the heat sink when installing or removing the module. The board should not be placed on any surface or in any form of storage container until the board and heat sink have cooled to room temperature.

NOTE

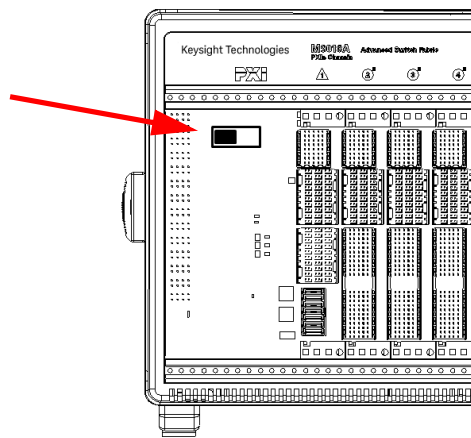
Embedded controllers, such as the M9037A, must be installed in System Controller slot (Slot 1) of the chassis.

NOTE

M9018A PXIe Chassis Backplane Switch:

The default position of the chassis backplane switch is to the left. However, if a Keysight M9021A Cable Interface module was previously installed in the M9018A chassis, then the backplane switch was moved to the right. To use the M9037A Embedded Controller in the M9018A chassis, the slide switch should be in the left position before installing the controller. Refer to the M9018A chassis documentation for more information.

Ensure the M9018A backplane switch is in the left position

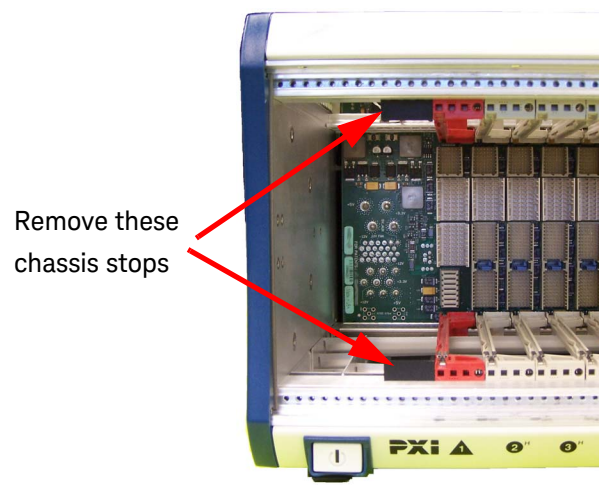


Follow these steps to install the M9037A Embedded Controller in a PXIe chassis.

- 1 Ensure the PXIe 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.

NOTE

Some non-Keysight PXIe chassis manufacturers install small chassis stops just to the left of the slot 1 guide rails (both top and bottom). Refer to the photo below. These must be removed prior to installing the M9037A Embedded Controller. They snap in and are easily pulled out.



- 2 On the M9018A chassis, set the rear panel **INHIBIT** switch to **DEF**.
- 3 Remove the screw protection caps from the four M9037A retaining screws.
- 4 Push down on the controller's ejector/injector handle. The red button on the handle must be depressed to release it.
- 5 Carefully align the M9037A board edges with the chassis guide rails for slot 1 (red guide rails) and insert the controller into the guide rails.
- 6 Push inward on the module until it is firmly seated in the chassis. (Do not force the handle if there is resistance; this may damage the connectors and/or backplane.)
- 7 Pull up on the ejector/injector handle to firmly seat the controller.
- 8 Tighten the module's four (4) captive retaining screws.
- 9 A slot blocker should be installed immediately to the left of the M9037A to ensure proper airflow.
- 10 Connect other peripherals (such as the keyboard, mouse, monitor, LAN cable for remote access, etc.) to the Embedded Controller.
- 11 Power up the PXIe chassis. Verify that the chassis fans are operating and free of obstructions that may restrict air flow.

Step 3: Install the M9037A Embedded Controller

Removing the M9037A from the chassis

To remove the M9037A controller, reverse the previous procedure. Execute the Windows shut down process on the controller first. Then power down the chassis. Loosen the four captive screws, press down on the ejector/injector handle and pull outwards to release the module from the backplane. Pull the module towards you until it is free of the chassis.

Power On Sequence

The M9037A controller, like any PC, will boot with the installed operating system. Refer to the *M9037A User Guide* for detailed power on and configuration sequence information.

NOTE

Depending on the system configuration, the BIOS may take 90 seconds (or longer) to boot. During this time, the Keysight splash screen (the Keysight logo) is present and it may appear that nothing is happening. This is generally caused by the inclusion of certain devices in the switch fabric (such as RAID controller) that require a longer time for PCI enumeration.

The first time the M9037A is powered up, it will prompt you to create a user password.

Power Off Sequence

As with any PC, Windows-based instruments should not 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 approved way to shut down the controller is to execute the Windows shutdown process which shuts down the M9037A controller then turns off the M9018A chassis. If the M9018A chassis rear panel INHIBIT switch is set to DEF then momentarily pressing the front panel button shuts down the M9037A safely.

Power Down Modes

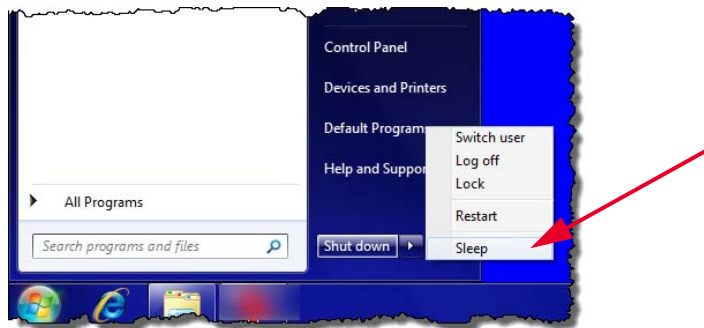
Keysight's M9037A defaults to the Windows High Performance Power Plan. This plan does not allow the controller display to shut off or the controller to enter a sleep mode.

NOTE

You should not enable the Microsoft Windows Sleep mode. It is possible that the M9037A 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 crescent moon logo), do not use it.

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



Activating Microsoft Windows

Keysight ensures that your copy of Microsoft Windows Embedded Standard 7 (WES7) Operating System is activated at the time it ships from the factory. However, the first time you install and turn on the M9037A and Windows starts, you must accept the End User License Agreement (EULA). A copy of the EULA was included in your controller shipment. A copy of the EULA is included on your controller in the folder:

C:\Windows\System32\en-US\Licenses\OEM\Professional\license.rtf

For information about Windows EULA, go to www.microsoft.com.

How to verify Windows Activation?

To verify Windows Activation, do the following:

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

CAUTION

By Keysight'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, Keysight cannot be held responsible for changes to the system caused by the automatic update process. Enabling automatic Windows updates exposes the controller to periodic OS changes and possible new system behaviors.

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 and Chassis Drivers

All of the M9037A Controller and M9018A Chassis drivers were installed on your controller at the factory. You should not need to reinstall them. The *M9037A Product Information CD* you received as part of the initial shipment (see "[Step 2: Verify Shipment Contents](#)" on page 11) provides a backup for the drivers. However, you should periodically check the M9037A web page (www.keysight.com/find/M9037A) for the most current drivers. Instructions for updating the drivers are on the web.

NOTE

If you already have a Keysight M9036A Embedded Controller and you want to upgrade to an M9037A, be aware that the IVI API drivers are not the same. You will need to update any programs/applications you have written and rebuild them.

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 Windows Automatic Updates is turned off. You may want to manually update Windows OS 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 Keysight for service.

System Backup and Recovery

Microsoft Windows Embedded Standard 7 (WES7) 32-bit or 64-bit Operating System is the only operating system installed on your M9037A. There is a small system partition for the Keysight Recovery System on the SSD. During the boot process, you are given the choice to boot to Windows 7 normally or boot from the recovery partition. Refer to the M9037A User Guide for detailed information.

NOTE

Some third-party disk backup utilities may destroy the Keysight backup partition. If this happens, the Keysight Recovery System will not work.

Step 4: Run Keysight IO Libraries Suite

Keysight IO Libraries Suite 16.3 Update 2 (or later) 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. It includes the Keysight Connection Expert, the IVI Shared Components, and the VISA Shared Components.

IVI drivers are installed in:

`C:\ProgramFiles\IVI Foundation\IVI\Drivers\AgPxiPc`

or


`C:\ProgramFiles x86\IVI Foundation\IVI\Drivers\AgPxiPc`

NOTE

Keysight IO Libraries version 16.3 Update 2 (or later) was pre-installed at the factory. The latest version can be downloaded from: www.keysight.com/find/iosuite.

NOTE

Keysight IO Libraries installs the IVI Shared Components and VISA Shared Components on your controller.

If Connection Expert is not already running, run it now to verify your I/O configuration. From the Windows **Start** button, select **All Programs > Keysight IO Libraries Suite > Keysight Connection Expert**. Alternately, you can select the icon () from the Windows messaging area.

Locate your interfaces and instruments in the Keysight Connection Expert Explorer Pane. The following graphic shows the Connection Expert screen.

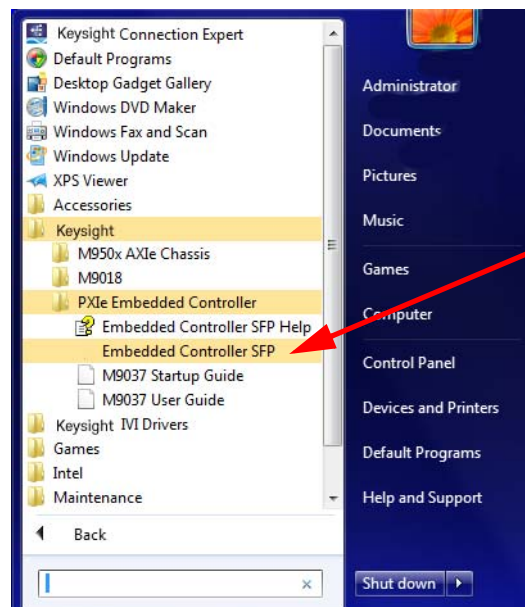
NOTE

All necessary drivers are pre-installed at the factory. These drivers include the mouse and keyboard drivers, video driver, GPIB driver, PXI trigger driver, etc.

Step 5. Verify Operation

There are no actual verification procedures for the M9037A Embedded Controller. If it boots properly and the front panel status LEDs do not indicate an error (see “**Front panel LED indicators**” on page 8), then the controller is working normally.

Note that you can use Keysight’s Soft Front Panel (SFP) software to monitor and control the triggering and the M9018A chassis function. To start the SFP programs, Click the Windows **Start** button > **All Programs** > **Keysight**. Then select either the **M9018A SFP** or the **Embedded Controller SFP**. See the following screen capture.



Step 6: Install User Application Modules in the PXIe Chassis

The PXIe chassis accepts modules conforming to the PXI standard, which can be installed in available slots in the chassis. These may include:

- PXI instrument or switch modules
- PXIe filler panel modules (PXIe chassis are shipped with filler panel modules in all but Slot 1; you may need to remove filler panels from covered slots.)

Turn off the chassis prior to installing modules but do not unplug the chassis from the AC power source; the AC power cord grounds the chassis and protects it from electrical damage when modules are installed or removed.

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 empty slots. Always insert a filler panel 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 slots empty can increase fan speed, raise ambient noise, overheat components, and shut down modules.
- **Hot Swap**—PXIe does not explicitly support hot swap for instrument modules. Keysight recommends fully powering down the chassis before installing or removing modules

Install application module drivers (if necessary)

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

NOTE

Connect the embedded controller to the internet to locate and install the necessary drivers.

Upgrading from the M9036A

If you already have a Keysight M9036A Embedded Controller and you are upgrading to an M9037A, be aware of the following:

- The GPIB cables are not compatible.
- The video output and cables are not compatible.
- The IVI and LabVIEW API drivers and the Soft Front Panel software are not the same. You will need to update any programs/applications you have written and rebuild them. The IVI Driver syntax (for the Trigger driver) M9036A used `AgM9036Trigger...` (for example, `AgM9036TriggerRouteTrigggerBusToExternal`) but the M9037A uses `AgPxiPxTrigger....` Other than the prefix, the commands are identical.
- The M9037A Trigger Output has a mild pull-down (via a 100 K Ω resistor) to ~0 V. The M9036A Trigger output floated to ~3 V.

Controller Operating System

Your M9037A comes with the Microsoft Windows Embedded Standard 7 (WES7) 32-bit or 64-bit Operating System preinstalled along with the latest version of Keysight's IO Libraries Suite (version 16.3 or later). This section provides some general system configuration and preventative maintenance procedures that you, the customer, are responsible for. In general, the M9037A operates as any other PC, including remote desktop access.

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 fire wall
- Get the latest Microsoft 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 > System & Security**).

The default system setting for Windows Automatic Updates is turned off. If you want it turned on, you need to manually update your Windows OS 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 spy ware 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 Keysight for service.

The Windows operating system supplied with your M9037A is licensed for use on the hard drive mounted to the controller. If the hard drive is replaced, it may be your responsibility to purchase or relicense the operating system.

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 approved way to shut down the controller is to execute the Windows shutdown process which shuts down the M9037A controller then turns off the M9018A chassis. If the M9018A chassis rear panel INHIBIT switch is set to DEF then momentarily pressing the front panel button shuts down the M9037A safely.

M9018A PCIe Link Configuration

PCIe link configuration refers to how the PXIe chassis (such as the M9018A) PCIe Switch Fabric is configured to connect PCI Express signals between slot 1, the system controller slot, and the other chassis slots. For a review of the supported PCIe link configurations, please refer to the M9018A User Guide (available from the Windows **Start** button, select **All Programs > Keysight > M9018A**).

Keysight's M9037A can operate with all of the PCIe fabric configurations found on the M9018A chassis. Although the default M9018A PCIe chassis fabric is "2-Link Configuration: 1x8" (this configuration, referred to as 1x8, provides one x8 PCIe link from the system controller slot to the PCIe Switch Fabric) you should reconfigure it to either 2x8 or 4x4 fabric.

The other supported PCIe link configurations are:

- **2-Link Configuration: 2x8** – Referred to as 2x8, this configuration provides two x8 links from the system controller slot to the PCIe Switch Fabric. Link 1 can be routed by the PCIe Switch Fabric to slots 2-9, while Link 2 can be routed to slots 10-18. This fabric provides a pair of x8 links for high data IO performance. This is the recommended configuration for most applications.
- **4-Link Configuration: 4x4** – Referred to as 4x4, this configuration provides four x4 links from the system controller slot to the PCIe Switch Fabric. Link 1 can be routed by the PCIe Switch Fabric to slots 10-14, Link 2 can be routed to slots 15-18, Link 3 can be routed to slots 2-5, and Link 4 can be routed to slots 6-9. This fabric is more compatible with other non-Keysight system modules.

If your system design requires another PCIe link configuration, such as 2x8, use the chassis **Configurator** utility to change the PCIe Switch Fabric.

The **Configurator** utility program is available from the Windows **Start** button; select **All Programs > Keysight > M9018A**. Instructions for using the **Configurator** program are provided in the M9018A Chassis User Guide.

NOTE

For more detailed information, refer to the M9037A User Guide and the M9018A 18-Slot PXIe Chassis User Guide.

Using LabVIEW

The Keysight LabVIEW G driver version 1.0.x or later is required for LabVIEW programmatic control of the M9037A trigger subsystem.

National Instrument's LabVIEW is not preinstalled on the M9037 controller, only the trigger driver is preinstalled. Consequently, the LabVIEW trigger driver and help files exist only in either the:

Program Files\Keysight\M9037\LabVIEW Driver\8.x or **\20xx** folder or the
Program Files (x86)\Keysight\M9037\LabVIEW Driver\8.x or **\20xx** folder.

(**8.x** represents LabVIEW version 8.5) and **20xx** represents LabVIEW 2009, 2010, etc.).

Open the appropriate folder (**8.x** or **20xx**) for the version of LabVIEW you installed on the M9037A. Copy the folder named **Keysight M9037** (this contains three subfolders and other files) and paste it in the directory:

Program Files\National Instruments\LabVIEW <your version>\instr.lib or
Program Files (x86)\National Instruments\LabVIEW <your version>\instr.lib

You also need to copy the associated LabVIEW help file, *AgPxiPc_LabVIEW_Help.chm* from the

Program Files\Keysight\M9037\LabVIEW Driver Help folder or the
Program Files (x86)\Keysight\M9037\LabVIEW Driver Help folder

to the directory:

Program Files\National Instruments\LabVIEW <your version> \help or
Program Files (x86)\National Instruments\LabVIEW <your version> \help

M9037A Accessories

Accessory Number	Description
Y1206A	Keyboard and optical mouse
Y1260A	GPIB Cable*
Y1262A	DisplayPort cable
Y1264A	Spare SSD with Carrier, WES7, 32-bit preinstalled†
Y1265A	Spare SSD with Carrier, WES7, 64-bit preinstalled†
Y1212A	Slot Blocker Kit (5 single slot blockers)
Y1213A	EMI Filler Panel Kit (5 single slot panels)
Y1214A	Air Inlet Kit (one 3-slot, two 1-slot)

* This is not the same GPIB cable used on the Keysight M9036A PXIe Controller, they are not compatible.

† Spare SSDs will not work with M9036A Embedded Controller

Environmental Operating Conditions

The Keysight M9037A PXIe Embedded Controller is designed to operate in a temperature range of 0 °C to +55 °C with non-condensing humidity. The maximum humidity is 95% at +40 °C. The maximum operating altitude is 3048 m (10,000 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 Keysight 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 Keysight web site at: www.keysight.com/find/M9037A. Test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.



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Edition 3 September 2014



M9037-90001
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