Startup Guide

Keysight M9036A PXIe Embedded Controller

KEYSIGHT
TECHNOLOGIES

Notices

Manual Part Number

M9036-90001

Edition

Sixth Edition, October 2019
Published in USA

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

Trademarks

AXIe is a registered trademark of the AXIe Consortium.

PXI is a registered trademark of the PXI Systems Alliance.

PICMG®, Compact PCI®, and AdvancedTCA® are registered trademarks of the PCI Industrial Computer Manufacturers Group.

PCI-SIG®, PCI Express®, and PCIe® are registered trademarks of PCI-SIG.

Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

www.keysight.com/find/M9036A (product-specific information and support, software and documentation updates)

www.keysight.com/find/assist (worldwide contact information for repair and service)

Declaration of Conformity

Declarations of Conformity for this product and for other Keysight products may be downloaded from the Web. Go to http://www.keysight.com/go/conformity and click on "Declarations of Conformity." You can then search by product number to find the latest Declaration of Conformity.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Warranty

DFARS/Restricted Rights Notices

Safety Information

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 AXIe 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
CAT II
CAT III
CAT IV

IEC Measurement Category I, II, III, or 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.

M9036A
MSIP-REM-Kst-BLM9036A

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) 전자파적합기 기로서 판 매자 또는 사용자는 이 점을 주 의하시기 바라 며 , 가정외의 지역에서 사용하는 것을 목적으 로 합니다.

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 Keysight office for more information.

Contents

Introduction

The Keysight M9036A is a 3U PXIe Embedded Controller providing:

- Intel Core™ i5-520E, 2.4 GHz processor.

- 4GB (or optional 8GB) 1333 MHz DDR3 Memory[*].

- 160GB SATA 2.5 inch solid state drive (SSD).

- Integrated IO on the front panel includes Gigabit Ethernet ports, four USB 2.0 ports, micro D-sub GPIB connector, ExpressCard 34, DVI-I Video, etc.

- 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 Suite and one of these operating systems:

  - Windows Embedded Standard 7 (WES 7) 32-bit or 64-bit

  - Windows 10 Enterprise LTSB 2016 64-bit

- Pre-installed IVI drivers for the Keysight PXIe chassis.

Related Documentation

A WES 7 or Win 10 operating system and all M9036A drivers were installed at the factory, no additional drivers are required. No printed documentation other than this Startup Guide is supplied with the controller.

Complete M9036A documentation, as well as the chassis documentation, is available preinstalled on the M9036A SSD.

For the latest M9036A specifications, go to: www.keysight.com/find/M9036A.

---

* The M9036A has two 240-pin, RDIMM sockets that support DDR3-1333 REG/ECC RAM sticks. Each socket supports memory modules up to 4GB for a total memory capacity of 8GB. The standard M9036A configuration is a single 4GB memory module with a factory option to add a second 4GB memory module. The ability of addressing 4GB memory is operating system dependent. A 32-bit OS system may not be able to address the full 4GB memory space. To use the full 4GB/8GB memory, a 64-bit OS must be used.

KEYSIGHT
TECHNOLOGIES

For the IVI trigger driver, help file, program examples, etc. go to:
 **C:\ProgramFiles\IVI Foundation\IVI\Drivers\AgM9036 or**
  C:\ProgramFiles x86\IVI Foundation\IVI\Drivers\AgM9036

For the Soft Front Panel interface: from the Window's Start menu, select:
  Start > All Programs > Keysight > M9036 PXIe Embedded Controller

M9036A at a Glance

The following figure shows the front panel for the M9036A. Detailed information about the module follows in this manual.
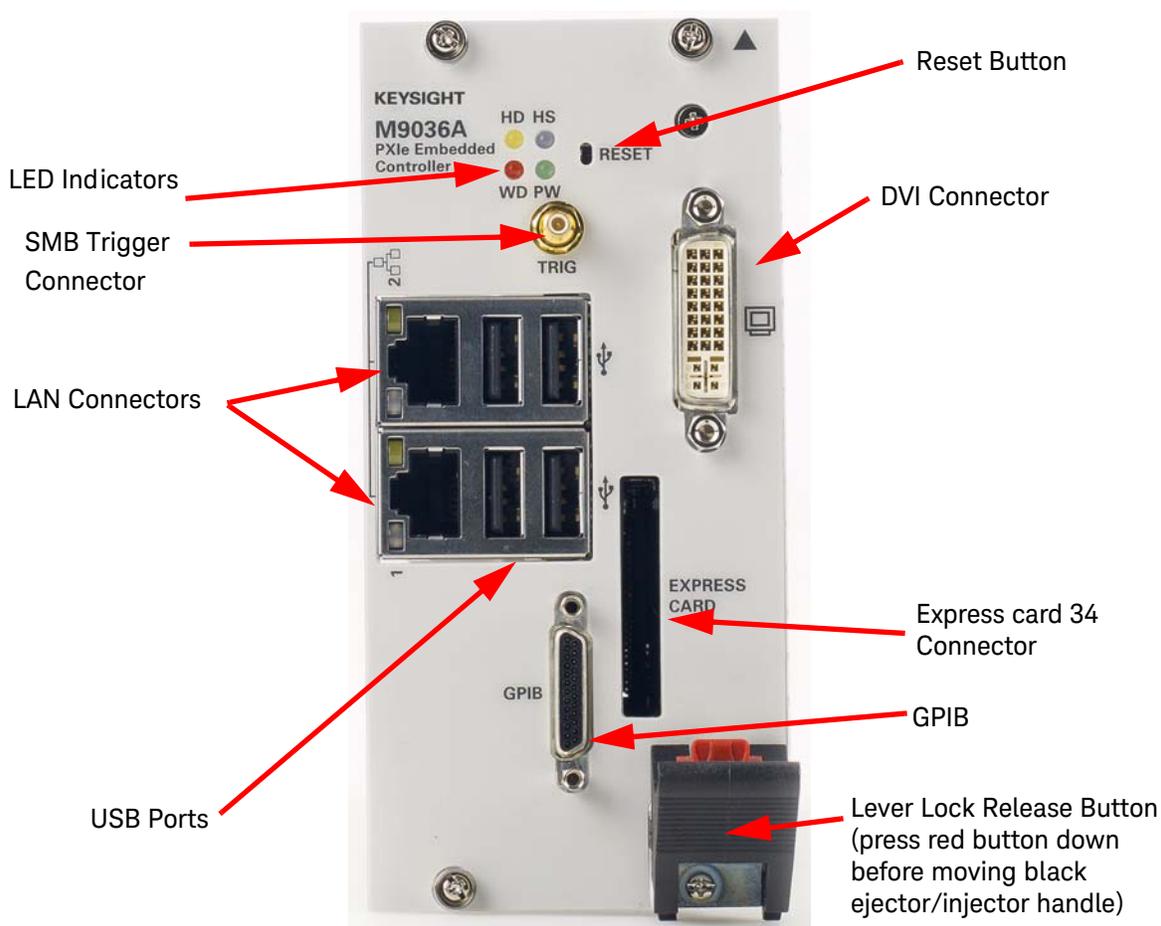
Front panel LED indicators

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	Yellow	When the Solid State Drive (SSD) is active, the LED will flash.
WD	Red	Not Used* *
Status	Blue	• If the LED is on and then turns off during system boot, then the system status is normal. • If the LED continues blinking or stays on, it indicates the system is not able to shut down properly. When the chassis Inhibit switch is in the Manual position, a controller shutdown results in a Microsoft Windows shutdown; however, the controller is not able to shut down the chassis power supply. As a result, the LED remains on until the chassis Inhibit pin is pulsed low (thus cycling the power supply) OR the chassis power button is pressed again causing Microsoft Windows to reboot.

* WD stands for Watchdog Timer and is not implemented in the M9036A. However, it is possible for this LED to turn on because of activity on the SMBus. Reboot the M9036A to turn the LED off.

Gigabit Ethernet (GbE) LEDs

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

Active
Blinking when accessing IO

RJ-45
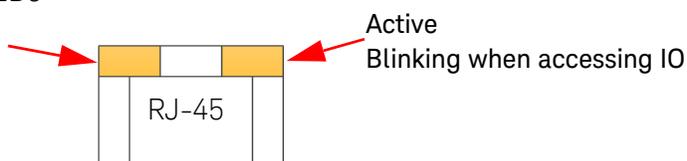
LED	Status	Description
Active/Link LED (yellow)	Off	Ethernet port is disconnected
	On	Ethernet port is connected but no data transmission
	Flash	Ethernet port is connected and is transmitting/receiving data
Speed LED	Off	10Mbps
	Green	100Mbps
	Amber	1000Mbps

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.
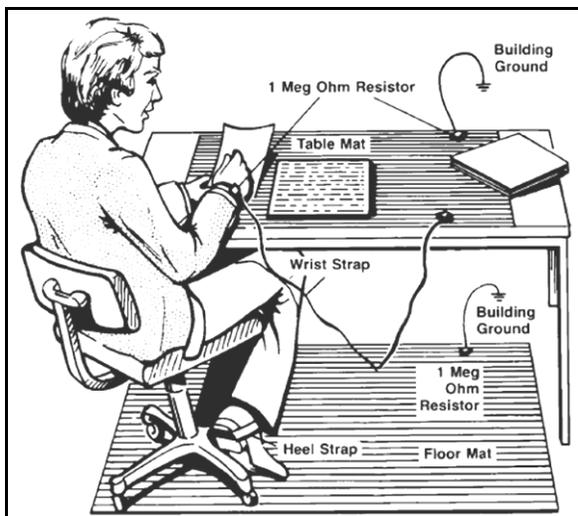
Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 MΩ of isolation from ground.

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.

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/M9036A.

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, M9036A)

- 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 For memory declassification or sanitization purposes, you may want to remove the SSD and RAM modules prior to returning the M9036A for service. Refer to the M9036A User Guide for detailed instructions.

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 M9036A Embedded Controller module that you ordered.

- This printed manual (M9036A PXIe Embedded Controller Startup Guide).

- An ExpressCard latch kit. Refer to the User Guide for instructions.

- A GPIB cable and a DVI-to-VGA adapter were also supplied with the controller:

DVI-to-VGA Adapter

GPIB Cable

NOTE Because there is no industry standard for the front micro D-sub 25 pin GPIB connector, interoperability cannot be guaranteed with other similar cables. A replacement adapter cable may be ordered from Keysight with the part number: M9036-31301.

The operating system of your choice (WES 7 32-bit or 64-bit, or Windows 10 64-bit), the latest version of the 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 M9036A 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.

Step 3: Install the M9036A Embedded Controller

The Keysight M9036A 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 M9036A 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 chassis.

CAUTION	**The following safety precautions must be observed when installing or operating the Keysight M9036A. 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 M9036A, <u>must</u> 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 M9036A 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
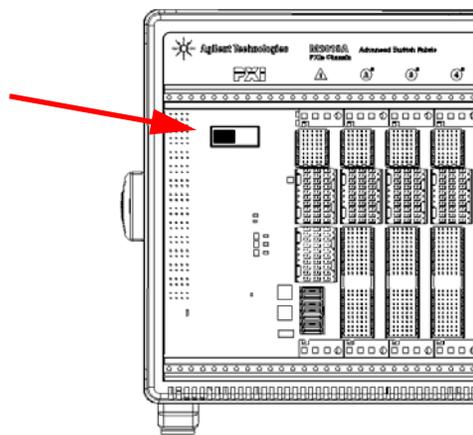
Follow these steps to install the M9036A Embedded Controller in a PXIe chassis.

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 M9036A Embedded Controller. They snap in and are easily pulled out.

Remove these chassis stops
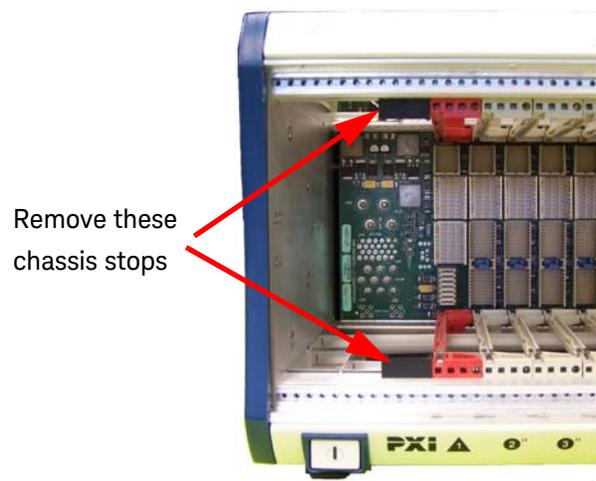
2 On the M9018A chassis, set the rear panel INHIBIT switch to DEF.

3 Remove the screw protection caps from the four M9036A 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 M9036A 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 M9036A to ensure proper airflow.

10 Connect other peripherals (such as the keyboard, mouse, monitor, LAN cable for remote access, etc.) to the Embedded Controller.

> **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 perform one orderly Restart of Windows (this will ensure all configuration files have been saved). Subsequent boots will then be ready for normal operation.

11 Power up the PXIe chassis. Verify that the chassis fans are operating and free of obstructions that may restrict air flow.

Auto Login

Your Windows default behavior is to automatically login to the Administrator account every time it boots. You do not need to type a password.

Default Administrator Password: **Keysight4u!**

The Keysight standard for the Administrator password is **Keysight4u!**
Your Administrator account is most likely is set with this password. If it is not set with this password, then there is no password.

Change Administrator Password

The default Administrator password is public knowledge. Keysight recommends that you change your password for improved security.

> **NOTE**
>
> Anyone who knows your current Administrator password can change the password. When you change your password you must enter the current password. Because Auto Login is enabled, you may not notice if someone changed the password.

How to change your password for "Windows 10 Enterprise 2016 LTSB":
1. Click the **Start** button at the bottom left of your screen.
2. Click **Settings** from the list to the left.
3. Select **Accounts.**
4. Select **Sign-in options** from the menu.
5. Click on **Change** under Change your account password.

How to set or change your password for "Windows Embedded Standard 7":
1. Press **Ctrl+Alt+Delete**, and then click Change a password.

2. Type your old password. Leave it blank if the password is not set.
3. Type your new password, and then type the new password again.
4. Press Enter.

Power On Sequence

The M9036A controller, like any PC, will boot with the operating system that you specified. Refer to the *M9036A User Guide* for detailed power on and configuration sequence information.

> **NOTE** Depending on the system configuration, the BIOS may take up to 90 second (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 M9036A 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 M9036A controller then turns off the chassis. If the chassis rear panel INHIBIT switch is set to DEF then momentarily pressing the front panel button shuts down the M9036A safely.

Power Down Modes

The Keysight M9036A 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 M9036A 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.

Removing the M9036A from the chassis

To remove the M9036A 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.

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 M9036A 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: 1x8 [Limited to PCIe Gen1 speed] — This fabric is specifically for use in subordinate chassis in multi-chassis configurations.

- 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.

- 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** > **PXIe Chassis Family > PCIe Switch Fabric Configurator.** Instructions for using the **Configurator** program are provided in the M9018A Chassis User Guide.

| NOTE | For more detailed information, refer to the M9036A User Guide and the M9018A chassis User Guide. |

Controller and Chassis Drivers

All of the M9036A Controller and M9018A Chassis drivers were installed on your controller at the factory. You do not need to reinstall them. You should periodically check the M9036A web page (www.keysight.com/find/M9036A) for the most current drivers. Instructions for updating the drivers are on the web.

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). Some updates automatically reboot the controller. Therefore, 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 my 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 have a backup strategy which is suitable for the system and data. User data back up should be done prior to sending the controller back to Keysight for service.

System Backup and Recovery

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 the operating system normally or boot from the recovery partition. Refer to the M9036A 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 (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.

NOTE	Keysight IO Libraries version 16.3 (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 M9036A Embedded Controller. If it boots properly and the front panel status LEDs do not indicate an error (see "Front panel LED indicators" on page 11), then the controller is working normally.

Step 6: Install User Application Modules in the PXI Express Chassis

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

- PXI or PXIe 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.)

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

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

Controller Operating System

Your M9036A comes with the Windows operating system of your choice of either WES 7 32-bit or 64-bit, or Windows 10 64-bit Operating System preinstalled along with the latest version of Keysight's IO Libraries Suite. This section provides some general system configuration and preventative maintenance procedures that you, the customer, are responsible for. In general, the M9036A 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 is Windows Automatic Updates is turned off. You need 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 anti-virus or spy ware software included with your controller. Anti-virus application software is the customer's responsibility. Having anti-virus 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 M9036A 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 re-license 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 M9036A controller then turns off the chassis. If the chassis rear panel INHIBIT switch is set to DEF then momentarily pressing the front panel button shuts down the M9036A safely.

Using LabVIEW

The Keysight LabVIEW G driver version 1.0.x or later is required for LabVIEW programmatic control of the M9036A trigger subsystem.

National Instrument's LabVIEW is not preinstalled on the M9036A controller, only the trigger driver is preinstalled. Consequently, the LabVIEW trigger driver and help files exist only in:
Program Files (x86)\Agilent\M9036\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 M9036A. Copy the folder named **Agilent M9036** (this contains three subfolders and other files) and paste it in the directory:
Program Files (x86)\National Instruments\LabVIEW <your version>\instr.lib

You also need to copy the associated LabVIEW help file, *AgM9036_LabVIEW_Help.chm* from the
Program Files (x86)\Agilent\M9036\LabVIEW Driver Help folder

to the directory:
Program Files (x86)\National Instruments\LabVIEW <your version> \help

Environmental Operating Conditions

The Keysight M9036A 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 46000 m (15000 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/M9036A. Test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.

KEYSIGHT
TECHNOLOGIES