



Agilent PXIe Embedded Controller M9036A

Startup Guide

Notices

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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. 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.

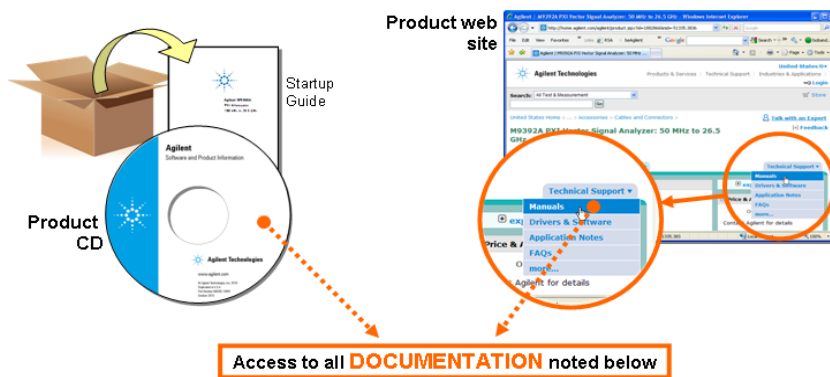
To return unwanted products, contact your local Agilent office, or see www.agilent.com/environment/<product> for more information.



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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.



Agilent M9036A Introduction

Agilent's M9036A is a 3U PXIe Embedded Controller with a state-of-the-art Intel® dual core processor.

- Intel® Core™ i5-520M, 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 Agilent IO Libraries and your choice of either Microsoft® Windows 7® 32-bit or Windows 7® 64-bit Operating System
- IVI drivers for the Agilent M9018A 18-slot PXIe chassis are also pre-installed on the controller.

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. A User Guide, detailed specifications, web links, etc. are found on the M9036A Product Information CD supplied with the controller. For the latest specifications, check the Agilent web site at: www.agilent.com/find/M9036A.

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

```
C:\ProgramFiles\IVI Foundation\IVI\Drivers\AgM9036
```

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

```
Start > All Programs > Agilent > M9036 PXIe Embedded Controller
```

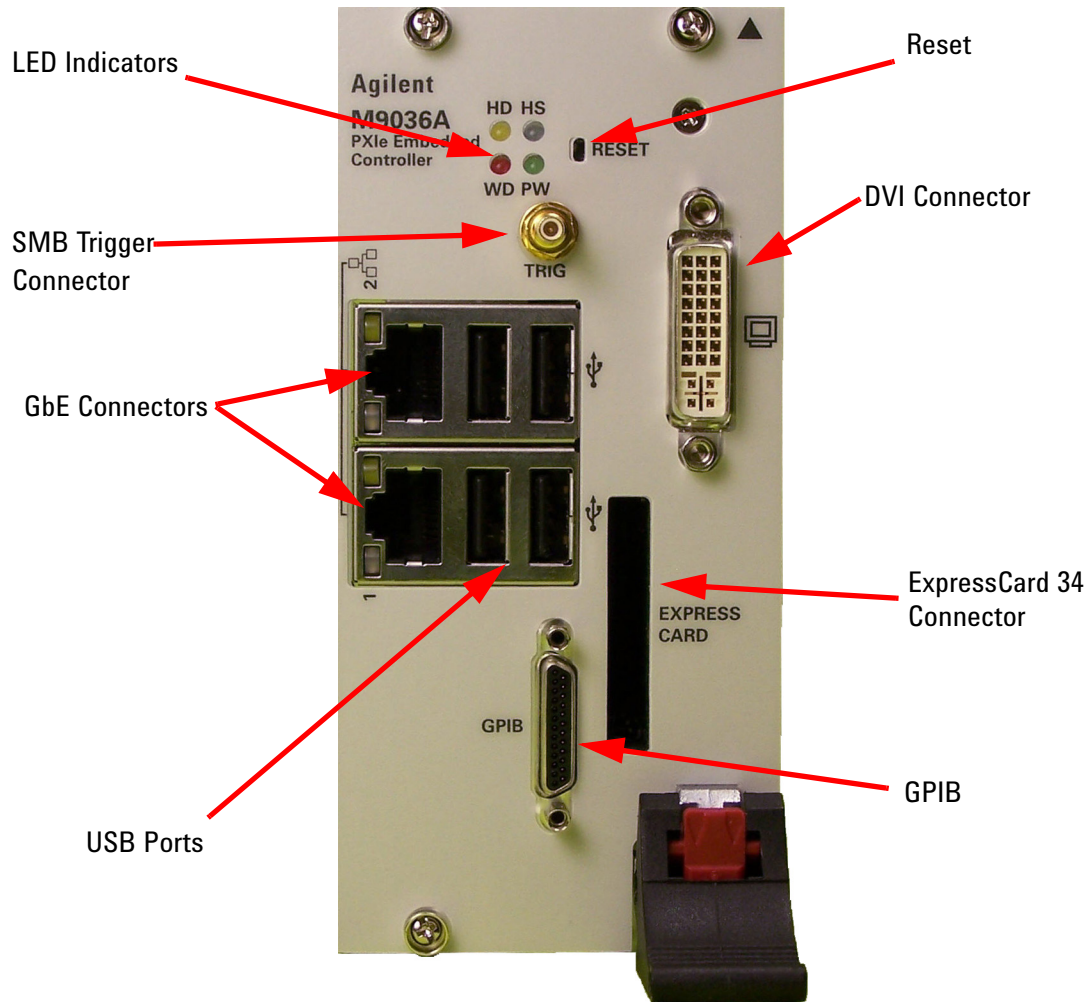
You can also check the M9036A Product Information CD or check on the web for the latest driver and documentation.

* The M9036A has two 240-pin, RDIMM sockets which support DDR3-1333 REG/ECC RAM sticks. Each socket can support memory modules up to 4GB for a total memory capacity of 8GB. The standard M9036A configuration is a single 4GB memory stick with a factory option to add a second 4GB memory stick. Note: The capability 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.



M9036A at a Glance

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



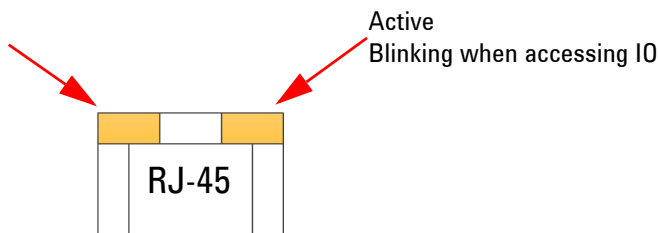
LED Definitions

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
PW (power)	Green	If the LED is on, the power supply to the controller is good and the system should boot.
HD (Hard Drive)	Yellow	When the hard drive is active, the LED will flash.
WD	Red	Not Used
HS (System Status)	Blue	If the LED is on then turns off during system boot, then the system status is normal. If the LED keeps blinking or stays on, the system is malfunctioning.

GbE LED

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



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

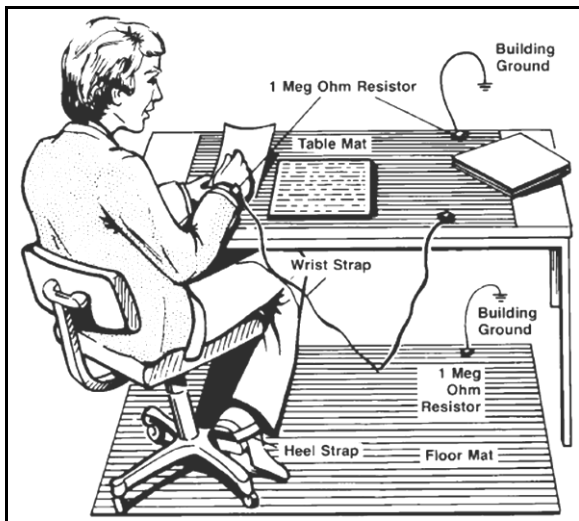
CAUTION

Agilent'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 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 an Agilent 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/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, MYXXXXXXXX). 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 M9036A Embedded Controller module that you ordered. A DVI-I adapter and a GPIB adapter were supplied with the controller.
- This printed manual (M9036A PXIe Embedded Controller Startup Guide).
- An *Automation-Ready CD with Agilent IO Libraries Suite* (version 16.1 or later). (IO Libraries was installed at the factory)
- An *M9036A Product Information CD* with User Guide and specifications. Adobe Reader required (<http://www.adobe.com>)
- Any other accessories that you ordered (cables, connectors, etc.).
- A GPIB cable and a DVI-to-VGA adapter were also supplied with the controller (see photo below):



NOTE

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

The operating system of your choice (MS Windows 7 32-bit, or Windows 7 64-bit) and all necessary driver software were installed for you at the factory.

NOTE

Agilent IO Libraries version 16.1 (or later) must be installed prior to installing and running any other 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 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 Agilent 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.

CAUTION

The following safety precautions must be observed when installing or operating the Agilent 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

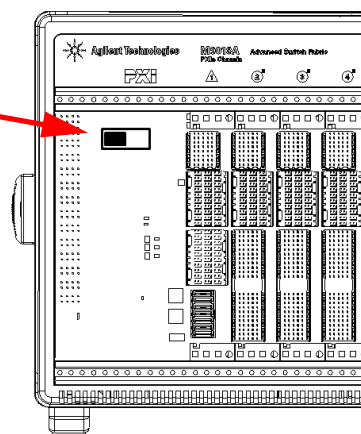
Embedded controllers, such as the M9036A, must be installed in System Controller slot (Slot 1) of the chassis.

NOTE

M9018A PXIe Chassis Backplane Switch:

The default position of the chassis backplane switch is to the left. However, if an Agilent 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 must 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

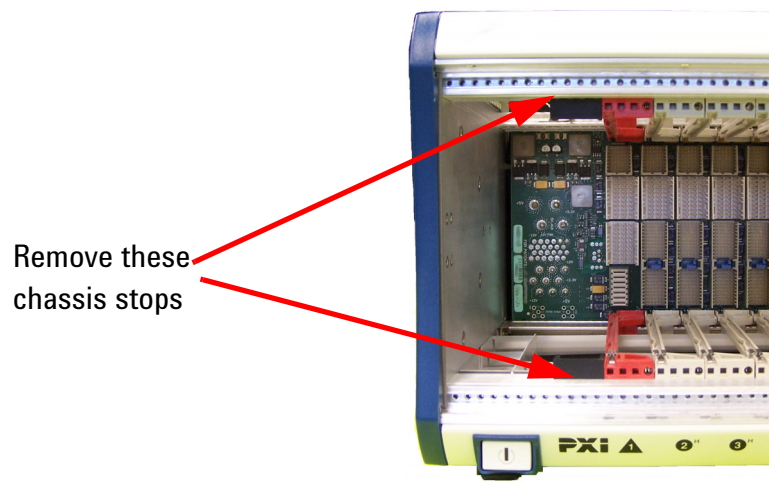


Follow these steps to install the M9036A Embedded Controller in a PXIe chassis.

- 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-Agilent 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.



- 2 Remove the screw protection caps from the four module retaining screws.
- 3 Push down on the controller's ejector/injector handle.
- 4 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.
- 5 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.)
- 6 Pull up on the ejector/injector handle to firmly seat the controller.
- 7 Tighten the module's four (4) captive retaining screws.
- 8 Connect other peripherals (such as the keyboard, mouse, monitor, LAN cable for remote access, etc.) to the Embedded Controller.
- 9 Power up the PXIe 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 PXIe Chassis for chassis power up / power down instructions.

Removing the M9036A

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.

Power On Sequence

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

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 only approved way to shut down the controller is to execute the Windows shutdown process which will turn the chassis power off.

Step 4: Run Agilent IO Libraries Suite


Agilent IO Libraries Suite 16.1 (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 Agilent Connection Expert, the IVI Shared Components, and the VISA Shared Components.

NOTE

Agilent IO Libraries version 16.1 (or later) is pre-installed at the factory. 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 controller.

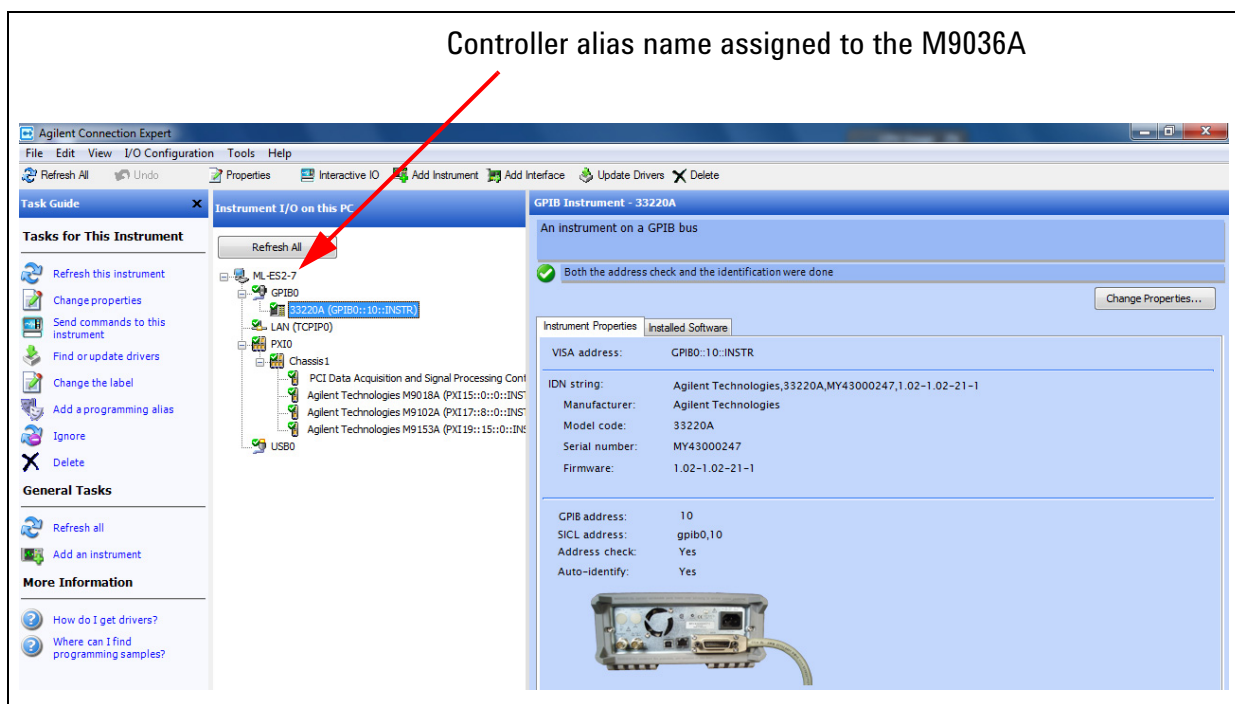
If Connection Expert is not already running, run it now to verify your I/O configuration. From the Windows **Start** button, click the **Agilent Connection Expert** (icon ).

Locate your interfaces and instruments in the Agilent 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



NOTE

In the Agilent IO Libraries Connection Expert, the M9036A Controller appears as the host controller at the top of the “Instrument I/O on this PC” (see the graphic above) but does not appear as an instrument inside the PXIe chassis.

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 “LED Definitions” on page 3), then the controller is working normally.

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

PXIe chassis accept modules conforming to the PXI standard, which can be installed in any available slot in the chassis. These may include:

- PXI instrument modules
- PXIe embedded controller module (must be installed in chassis slot 1)
- 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. Agilent recommends fully powering down and unplugging 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. Locate and install the necessary drivers from the internet.

Controller Operating System

Your M9036A comes with the Windows operating system of your choice of either Microsoft® Windows 7® 32-Bit or Windows 7® 64-Bit Operating System preinstalled along with the latest version of Agilent's IO Libraries Suite (version 16.1 or later). 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 > Security Center).

The default system setting is to 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 not 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 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.

Hard drive

Over time, the information on the hard drive will become fragmented. Fragmentation can slow down your computer. Windows operating systems have a disk defragmentation utility that you can use to defragment the hard drive so it can work more efficiently. Access this utility from **Start > All Programs > Accessories > System Tools**.

NOTE

All measurement applications should be closed prior to running the disk defragmentation utility. Measurement throughput will be significantly impacted while disk defragmentation is in process.

Two other utilities are also provided on Windows operating systems, Check Disk and Disk Cleanup:

- Start Check Disk by going to **Start > My Computer** then right-click on the hard drive (C:) and select **Properties**. From the **Tools** menu, select **Check Now...** under the Error Checking section.
- Disk Cleanup starts from the **Start > All Programs > Accessories > System Tools**.

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.

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 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 only approved way to shut down the controller is to execute the Windows shutdown process which will turn the chassis power off.

Using LabVIEW

The Agilent 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 M9036 controller, only the trigger driver is preinstalled. Consequently, the LabVIEW trigger driver and help files exist only in either the:

Program Files\Agilent\M9036\LabVIEW Driver\8.x or \20xx folder or the
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\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, *AgM9036_LabVIEW_Help.chm* from the

Program Files\Agilent\M9036\LabVIEW Driver Help folder or the
Program Files (x86)\Agilent\M9036\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

Environmental Operating Conditions

The Agilent 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 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/M9036A. Test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.

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