Security Guide

Keysight M9514A AXIe 14-Slot Chassis and M9521A AXIe System Module

KEYSIGHT TECHNOLOGIES

Notices

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

www.keysight.com/find/M9514AA (product-specific information and support, software and documentation updates)

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

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

Declaration of Conformity

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

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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. 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.


Protective Earth Ground terminal


Chassis Ground.


Alternating Current (AC).

Three-Phase Alternating Current


Direct Current (DC).


Both direct and alternating current


Terminal is at earth potential.

Terminal for Neutral conductor on properly installed equipment

Terminal for Line conductor on properly installed equipment


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 Agilent Safety document (p/n 5185-8500) on the product CD.

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.

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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)
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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, or see www.keysight.com/environment/product for more information.

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

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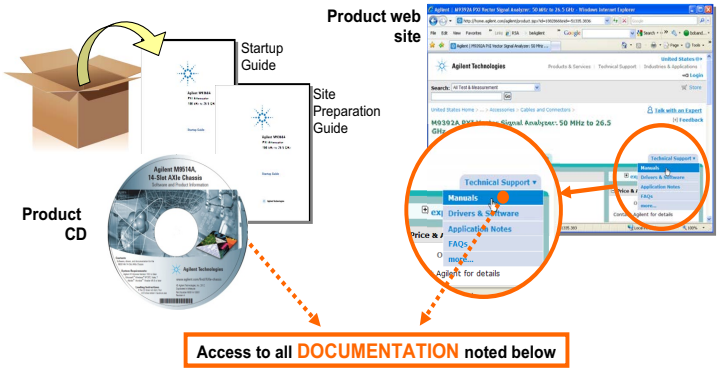

Site Preparation Guide

- Uncrate chassis
- Verify shipment
- Installation Considerations
- AC power line requirements

Startup Guide

- Install software
- Install & connect hardware
- Verify operation
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- Troubleshoot
- Repair
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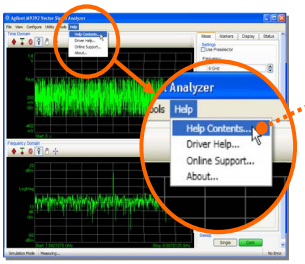

SFP help system

- Product theory of operation
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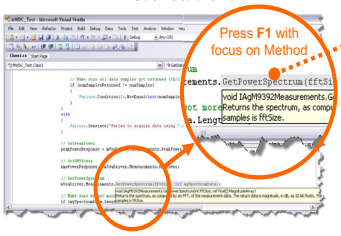
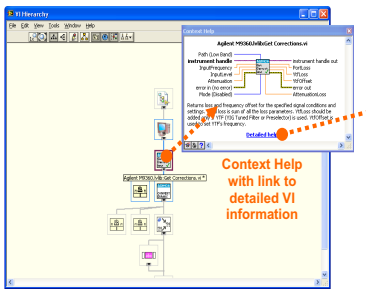
Visual Studio



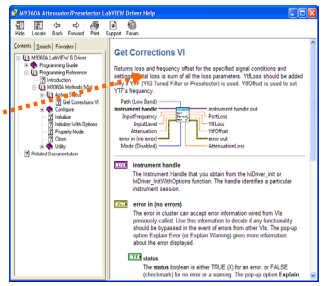
IVI Driver help system

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

LabVIEW



LabVIEW Driver help system



- LabVIEW driver programmer's reference

M9514A and M9521A
Security Guide

Memory Declassification Procedure

Some test equipment users have a need to “declassify” or “sanitize” their instruments for security purposes. This involves following a procedure to clear all user data from the instrument’s memory. The result is a sanitized instrument that can be removed from a secure area without any chance of classified data being recovered from it.

This document details the internal memory locations of the M9514A 14-Slot AXIe chassis and the M9521A AXIe System Module (ASM). It describes instrument security features and the steps necessary to declassify the products through memory sanitization or removal. For additional information on a particular product, the Keysight Instrument Security Database may be accessed here: www.keysight.com/find/security.

For general information, the Keysight Aerospace and Defense web page may be found here: www.keysight.com/find/ad.

NOTE

On the M9514A Home Web Page and the M9521A Home Web Page, there is a button labeled, “**Reset User--Settable Memory**.” This button resets all user-settable non-volatile memory, returning the chassis or ASM to its factory default state.

CAUTION: Clicking on this button resets all user-settable non volatile memory in the chassis or ASM to its factory state. Doing this will interrupt connectivity with the chassis or ASM and will require setting up the chassis or ASM as a new device in Keysight Connection Expert., See the *M9514A and M9521A User Guide* for detailed information.

Definitions:

Clearing - Clearing is the process of eradicating the data on media before reusing the media so that the data can no longer be retrieved using the standard interfaces on the instrument. Clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.

Sanitization - Sanitization is the process of removing or eradicating stored data so that the data cannot be recovered using any known technology. Instrument sanitization is typically required when an instrument is moved from a secure to a non-secure environment such as when it is returned to the factory for calibration. Keysight memory sanitization procedures are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS). These requirements are outlined in the “Clearing and Sanitization Matrix” issued

by the Cognizant Security Agency (CSA) and referenced in National Industrial Security Program Operating Manual (NISPOM) DoD 5220.22M ISL 01L-1 section 8-301.

Security erase - Security erase is a term that is used to refer to either the clearing or sanitization features of Keysight instruments.

Instrument declassification - A term that refers to procedures that must be undertaken before an instrument can be removed from a secure environment such as is the case when the instrument is returned for calibration. Declassification procedures will include memory sanitization and or memory removal. Keysight declassification procedures are designed to meet the requirements specified by the DSS NISPOM security document (DoD 5220.22M chapter 8).

Sales and Technical Support

For product specific information and support, and to obtain the latest software and documentation, refer to the following Keysight web resources:

www.keysight.com/find/M9514A (AXIe chassis)

www.keysight.com/find/M9521A (AXIe System Module)

Worldwide contact information for repair and service can be found at:
www.keysight.com/find/assist

M9514A 14-Slot AXIe Chassis

On the M9514A Web Page there is a button labeled, "**Reset User--Settable Memory**." This button resets all user-settable non-volatile memory, returning the chassis to its factory state.

CAUTION

Clicking on this button resets all user-settable non volatile memory in the chassis to its factory state. Doing this will interrupt connectivity with the chassis and will require setting up the chassis as a new device, See the *M9514A and M9521A User Guide* for detailed information.

The following are reset in the M9514A Chassis:

- The LAN IP Address is reset to 169.254.1.0
- The fan dynamic Minimum Level and the Current Speed Level is reset to 35. Note that the Shelf Manager may override this depending on the heat load in the chassis.
- The Serial Number is not reset or changed.

The following tables list the types of memory used in the AXIe chassis. It explains the memory size, how it is used, its location, volatility, and the sanitization procedure.

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
I2C EEPROM 64 KBits	No	No	Yes	Shelf Manager FRU#1 data	Factory and Firmware upgrades	FRU1 Backplane board	N/A
I2C EEPROM 64 KBits	No	No	Yes	Shelf Manager FRU#2 data	Factory and Firmware upgrades	FRU2 Backplane board.	N/A
I2C EEPROM 64 KBits	No	No	Yes	Fan controller #1 FRU code	Factory and Firmware upgrades	U41 Backplane board	N/A

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
ROM 256 KBytes	No	No	Yes	Fan controller #1 firmware image	Factory and Firmware upgrades	U65 Backplane board	N/A
I2C EEPROM 64 KBits	No	No	Yes	Fan controller #2 FRU code	Factory and Firmware upgrades	U62 Backplane board	N/A
ROM 256 KBytes	No	No	Yes	Fan controller #2 firmware image	Factory and Firmware upgrades	U54 Backplane board	N/A
ROM 128 Kbytes + NOR Flash 64 MBytes + Flash 128 KBytes	No	No	Yes	Shelf Manager code	User saved Dynamic Min. Fan Speed	CN5 Backplane board	See "Memory Clearing, Sanitization and/or Removal Procedures" on page 6
I2C EEPROM 64 KBits	No	No	Yes	Fan tray #1 data	Factory and Firmware upgrades	U8 Fan tray #1	N/A
ROM 256 KBytes	No	No	Yes	Fan tray #1 code	Factory and Firmware upgrades	U2 Fan tray #1	N/A
I2C EEPROM 64 KBits	No	No	Yes	Fan tray #2 data	Factory and Firmware upgrades	U8 Fan tray #2	N/A
ROM 256 KBytes	No	No	Yes	Fan tray #2 code	Factory and Firmware upgrades	U2 Fan tray #2	N/A
I2C EEPROM 64 KBits	No	No	Yes	Fan tray #3 data	Factory and Firmware upgrades	U8 Fan tray #3	N/A

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
ROM 256 KBytes	No	No	Yes	Fan tray #3 code	Factory and Firmware upgrades	U2 Fan tray #3	N/A

Memory Clearing, Sanitization and/or Removal Procedures

The following table explains how to clear, sanitize, and remove memory from your instrument for all memory that can be written to during normal operation and for which the clearing and sanitization procedure is more than trivial such as rebooting your instrument.

Description and purpose	**Shelf Manager memory holds a non volatile copy of the LAN address and also contains the Dynamic Minimum Fan Level settings. The Dynamic Minimum Fan Level settings can be modified by the user.**
Size	128 Kbyte Flash contains the user modifiable settings
Memory clearing	Use same procedure documented below in Memory sanitization.
Memory sanitization	Two steps are needed, and they must be performed in the order given below. Before proceeding, you may want to turn off the chassis and unplug modules so that a low Dynamic Minimum Fan Level will remain in effect once set. Then power on the chassis and follow the steps below. 1. Overwrite the saved Dynamic Minimum Fan Level by setting a new value. This can be done from the Soft Front Panel in the following manner: a. Start the Soft Front Panel of the chassis. b. Select the menu choice Configure->Configure Fan Speed Level c. Specify the new level to be 35, which is the factory default level. d. Press the Apply button to set the new value. Then press Close to exit the dialog. 2. Reset the LAN IP address by doing the following: a. Locate the access hole on the upper left section of the front panel that is labeled IP Reset. b. Insert a small tool into the hole and hold down the switch for at least two seconds. c. Step b above causes the LAN IP address to be reset to 169.254.1.0 and saved into non volatile memory. This sanitization procedure complies with the clearing requirements specified for NVRAM in the “Clearing and Sanitization Matrix” referenced in DoD 5220.22M ISL 01L-1 section 8-301 as current on 12/15/2004"). In some cases where Keysight only provides a sanitization procedure, this procedure may also work for the clearing procedure; (e.g.," use same procedure as for sanitization")
Memory removal	This memory can not be removed without damaging the instrument

M9521A AXIe System Module (ASM)

On the M9521A Web Page, there is a button labeled, "**Reset User--Settable Memory**." This button resets all user-settable non-volatile memory, returning the ASM to its factory state.

CAUTION

Clicking on this button resets all user-settable non volatile memory in the ASM to its factory state. Doing this will interrupt connectivity with the ASM and will require setting up the ASM as a new device, See the *M9514A and M9521A User Guide* for detailed information.

The following are reset in the M9521A Chassis:

- The LAN IP Address is reset to 169.254.1.1
- The ASM Power-on state is reset to the Factory Power-on State.
- The Serial Number is not reset or changed.

The following table lists the types of memory used in the AXIe System Module (ASM). It explains the memory size, how it is used, its location, volatility, and the sanitization procedure.

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
Flash Memory 512 KBytes	No	No	Yes	IPMC Firmware	Factory	U1 Main board	N/A
I2C EEPROM 256 KBits	No	No	Yes	Used by IPMC firmware for persistent data storage	Factory and Firmware update	U96 Main board	N/A
SPI Flash memory 64 MBits	No	No	Yes	Temporary storage used by IPMC firmware	Remote upgraded of IPMC firmware	U4 Main board. This is only used when doing a remote update of the IPMC firmware.	N/A
SPI Flash memory 8 Mbits	No	No	Yes	LAN Switch firmware	Factory	U11 Main board	N/A

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
XCF16P PROM 16 MBits	No	No	Yes	FPGA EPROM	Factory and Firmware update	UG1 Main board	N/A
I2C EEPROM 512 KBits	No	No	Yes	32-lane PCI Switch Configuration EEPROM 1 of 2	Factory and Firmware update	UC2 Main board	N/A
I2C EEPROM 512 KBits	No	No	Yes	32-lane PCI Switch Configuration EEPROM 2 of 2	Factory and Firmware update	UC5 Main board	N/A
I2C EEPROM 512 KBits	No	No	Yes	64-lane PCI Switch Configuration EEPROM 1 of 2	Factory and Firmware update	UC4 Main board	N/A
I2C EEPROM 512 KBits	No	No	Yes	64-lane PCI Switch Configuration EEPROM 2 of 2	Factory and Firmware update	UC6 Main board	N/A
SPI EEPROM 256 KBits	No	No	Yes	Contains LAN MAC data	Factory	U61 Main board	N/A
I2C EEPROM 64 KBits	No	No	Yes	ASM FRU data	Factory	UX3 Main board	N/A
ROM 128 Kbyes + Flash 64 MBytes + 128 KBytes Flash	No	No	Yes	Shelf Manager module	Factory and firmware update	CN3 Main board	See “Memory Clearing, Sanitization and/or Removal Procedures” on page 10.
I2C EEPROM 16 MBits	No	No	Yes	PCI Endpoint FPGA image	Factory	U37 Main board	N/A
I2C EEPROM 64 KBits	No	No	Yes	PCI Endpoint data	Factory	U203 Main board	N/A

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
I2C EEPROM 64 KBits	No	No	Yes	ASM FRU data	Factory	UX3 Main board	N/A
SPI Flash memory 8 Mbits	No	No	Yes	PCI Endpoint FPGA image	Factory	U37 Main board	N/A
I2C EEPROM 64 KBits	No	No	Yes	PCI Endpoint FPGA EEPROM	Factory	U203 Main board	N/A
I2C EEPROM 64 KBits	No	No	Yes	Clock Mezzanine board information	Factory	U75 Clock Mezzanine board	N/A

Memory Clearing, Sanitization and/or Removal Procedures

The following table explains how to clear, sanitize, and remove memory from your instrument for all memory that can be written to during normal operation and for which the clearing and sanitization procedure is more than trivial such as rebooting your instrument.

Description and purpose	**Shelf Manager memory holds a non volatile copy of the LAN address and also contains the power on state for the system module settings. A custom power on state can be saved by a user.**
Size	20 MB
Memory clearing	Use same procedure documented below in Memory sanitization.
Memory sanitization	Two steps are needed, and they must be performed in the order given below: 1. Overwrite the power on state in memory by saving the Factory Default state as the new power on state. This can be done from the Soft Front Panel in the following manner: a. Start the Soft Front Panel of the system module. b. Select the menu choice Utilities->AdvancedConfiguration->Reset to Factory State... c. A warning dialog will now come up, informing you that the system module will be set to the Factory Default state. Press OK to accept that action. d. Select menu choice Utilities->AdvancedConfiguration->Save As Power On State... 2. Reset the LAN IP address by doing the following: a. Locate the access hole on the upper section of the front panel that is labeled LAN Reset. b. Insert a small tool into the hole and hold down the switch for at least two seconds. c. Step b above resets the LAN IP address to 169.254.1.1and saved into non volatile memory. This sanitization procedure complies with the clearing requirements specified for NVRAM in the “Clearing and Sanitization Matrix” referenced in DoD 5220.22M ISL 01L-1 section 8-301 as current on 12/15/2004"). In some cases where Keysight only provides a sanitization procedure, this procedure may also work for the clearing procedure; (e.g.," use same procedure as for sanitization")
Memory removal	This memory can not be removed without damaging the instrument

References

For additional information, refer to:

- DOD 5220.22-M, “National Industrial Security Program Operating Manual (NISPOM)”, United States Department of Defense. May be downloaded from here: www.dss.mil/isp/fac_clear/download_nispom.html

- ODAA Process Guide for C&A of Classified Systems under NISPOM, Defense Security Service. DSS-cleared industries may request a copy of this document by following the instructions at: www.dss.mil/isp/odaa/request.html

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