Security
Guide

Keysight M9537A AXIe Embedded Controller



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TECHNOLOGIES

Notices

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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/M9537A (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://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 and Regulatory 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 and Low Voltage Directive .



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.

Cet appareil ISM est conforme a la norme NMB-001 du Canada.



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.



M9537A
MSIP-REM-Kst-xxxxx

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) 전자파적합기기로서 판 매자 또는 사용자는 이 점을 주의하시기 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.



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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 M9537A AXIe Embedded Controller. 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 at www.keysight.com/find/security.

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

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 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 available at: www.keysight.com/find/M9537A (Embedded Controller).

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

Procedure for Declassifying a Controller

Even if the M9537A is not able to power on, it may be declassified by removing the SSD (disk drive) from the controller. Follow the procedure in the Keysight M9537A AXIe Embedded Controller Service Guide.

For additional information, go to www.keysight.com/find/security and enter the model number of you controller (M9537A).

Controller memory

The following table lists the types of memory used in the M9537A controller. It explains the memory size, how it is used, its location, volatility, and the sanitization procedure.

Memory	Is memory user accessible as a mass storage device?	Data retained when powered off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
Main memory (RAM) 8Gb Standard, 16 GB optional, 32 GB maximum	Yes	No	Windows Embedded System 7 memory. Data input from user, operating system	Operating system, user saved,	Motherboard	Cycle power. This is volatile memory
Media Storage 240 GB SSD drive	Yes	Yes	Windows Embedded System 7 boot device and user files including saved programs, data, settings, images, etc.	Operating System factory installed. Other data is user saved.	Motherboard	Remove. See below.
Optional highspeed disk cache 2.5" NVMe SSD 400 GB	Yes	Yes	User files including saved programs, data, settings, images, etc.	Other data is user saved.	Motherboard	See below.
Flash memory for BIOS (Non-volatile memory) 16 GB	No	Yes	Contains default BIOS settings for use when booting the controller. Contains no user data.	Programmed at factory (or during BIOS upgrade). Settings may be changed by user.	Motherboard	None

Memory	Is memory user accessible as a mass storage device?	Data retained when powered off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
Flash memory for failsafe BIOS (Non-volatile memory) 16 MB	No	Yes	Contains backup BIOS settings for use when main flash memory for BIOS get corrupted during BIOS update. Contains no user data.	Programmed at factory.	Motherboard	None
CMOS Memory 128 bytes	No	Yes	Settings used by BIOS and real-time clock	Settings may be toggled by user.	Motherboard	Remove battery or reset CMOS memory. See User Guide.

SSD and NVMe Data Destruction: Several commercially available software programs exist to completely destroy all data on a data storage device such as the SSD. DoD 5220.22-M is a software based data sanitization method for total data destruction. The DoD 5220.22-M sanitization method was originally defined by the U.S. National Industrial Security Program (NISP) in the National Industrial Security Program Operating Manual (NISPOM). The process involves overwriting existing information on the SSD (or other data storage device). Typically, this means writing a 0 (zero) to every addressable location on the device, verifying the write, writing a 1 (one) to every addressable location and verifying the write, and then writing a random character (in some cases writing a 97) to every addressable location and verifying the write. Using a DoD 5220.22-M sanitization (or a variant) prevents all software and hardware based data recovery methods from obtaining information from the SSD.

SSD Removal: It is virtually impossible to completely and selectively erase all user data on a hard drive without also destroying the operating system. Hence, the best method for maintaining security when the controller must be removed from a secure area is to remove or replace the hard drive.

To remove the hard drive:

1. Power off the chassis. You do not need to remove the M9537A controller from the chassis to replace the SSD drive.
2. Loosen the two thumb screws securing the cover to the controller's front panel.

3 Unseat the removable SSD with its mounting bracket from the connector and pull straight out.

NOTE

If the SSD is removed from the M9537A, do not attempt to power it up. Always install the SSD before applying power to the M9537A. If you do not, then the SATA selection is eliminated from the boot option list. If the SSD is then reinstalled, then at boot the SATA selection will no be the first option to boot from. The boot order should be changed so that SATA is the first option.

For detailed information on removing the NVMe, refer to the *Keysight M9537A AXIe Embedded Controller Service Guide*.

References

For additional information, refer to:

- DOD 5220.22-M, National Industrial Security Program Operating Manual (NISPOM), United States Department of Defense. You can download this manual from: www.dss.mil.
- ODAA Process Guide for C&A of Classified Systems under NISPOM, Defense Security Service. DSS-cleared industries is available online at: www.dss.mil.

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