

## Security Guide

# Keysight M9506A 5-Slot AXIe Chassis



# 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/M9506A](http://www.keysight.com/find/M9506A) (product-specific information and support, software and documentation updates)

[www.keysight.com/find/assist](http://www.keysight.com/find/assist) (world-wide contact information for repair and service)

Information on preventing damage to your Keysight equipment can be found at [www.keysight.com/find/tips](http://www.keysight.com/find/tips).

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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 a 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 a Keysight Sales and Service Office to ensure that safety features are maintained.

### In Case of Damage

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel

## CAUTION

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

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

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

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

## WARNING

Operator is responsible to maintain safe operating conditions. To ensure safe operating conditions, modules should not be operated beyond the full temperature range specified in the Environmental and physical specification. Exceeding safe operating conditions can result in shorter lifespan, improper module performance and user safety issues. When the modules are in use and operation within the specified full temperature range is not maintained, module surface temperatures may exceed safe handling conditions which can cause discomfort or burns if touched. In the event of a module exceeding the full temperature range, always allow the module to cool before touching or removing modules from the chassis.

# Safety Symbols

## CAUTION

A CAUTION denotes a hazard. It calls attention to an operating procedure or practice, that, if not correctly performed or adhered to could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

## WARNING

A WARNING denotes a hazard. It calls attention to an operating procedure or practice, that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Products display the following symbols:



Warning, risk of electric shock



Refer to manual for additional safety information.



Earth Ground.



Chassis Ground.



Alternating Current (AC).



Standby Power. Unit is not completely disconnected from AC mains when switch is in standby.



Antistatic precautions should be taken.

CAT I IEC Measurement Category I, II, III, or IV  
 CAT II  
 CAT III  
 CAT IV

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



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



Notice for European Community: This product complies with the relevant European legal Directives: EMC Directive (2004/108/EC) and Low Voltage Directive (2006/95/EC).



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

## ICES/NMB-001

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



This symbol represents the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of this product.



MSIP-REM-Kst  
 -BLM9506A

South Korean Class A EMC Declaration. this equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

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 이 기기는 업무용 ( A 급 ) 전자파적합기  
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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 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 M9506A 5-Slot AXIe chassis. 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](http://www.keysight.com/find/security).

For general information, the Keysight Aerospace and Defense web page may be found here: [www.keysight.com/find/ad](http://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 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/M9506A](http://www.keysight.com/find/M9506A)

Worldwide contact information for repair and service can be found at:

[www.keysight.com/find/assist](http://www.keysight.com/find/assist)

## 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.

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

### M9506A chassis

<b>Memory Type: I2C EEPROM</b>		<b>Memory Size: 64 Kb</b>	
<b>Description:</b> EEPROM tied to ShMM I2C bus		<b>Reference Designation:</b> U135	
<b>Memory Function:</b> Chassis Field Replaceable Unit (FRU) containing product, serial, part, and configuration information.			
<b>User Modifiable (Y/N):</b> N		<b>Volatile (Y/N):</b> N	
<b>Memory Erase Processes:</b> Firmware upgrade procedure			

<b>Memory Type: I2C EEPROM</b>		<b>Memory Size: 64 Kb</b>	
<b>Description:</b> EEPROM tied to ShMM I2C bus		<b>Reference Designation:</b> U136	
<b>Memory Function:</b> Chassis Field Replaceable Unit (FRU) containing product, serial, part, and configuration information.			
<b>User Modifiable (Y/N):</b> N		<b>Volatile (Y/N):</b> N	
<b>Memory Erase Processes:</b> Firmware upgrade procedure			

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 256 Kb
<b>Description:</b> EEPROM tied to Fan IPMC U51	<b>Reference Designation:</b> U54
<b>Memory Function:</b> FAN Controller Field Replaceable Unit (FRU) containing product, serial, part, and configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 256 Kb
<b>Description:</b> EEPROM tied to Fan IPMC U51	<b>Reference Designation:</b> U55
<b>Memory Function:</b> FAN Controller Field Replaceable Unit (FRU) containing product, serial, part, and configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SRAM	<b>Memory Size:</b> 64 KB
<b>Description:</b> Smartfusion FPGA ARM CPU SRAM	<b>Reference Designation:</b> U51
<b>Memory Function:</b> Fan controller firmware operating RAM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> Y
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> Flash Memory	<b>Memory Size:</b> 512 KB
<b>Description:</b> Smartfusion FPGA ARM CPU Flash	<b>Reference Designation:</b> U51
<b>Memory Function:</b> Fan controller firmware image	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> FPGA Fabric	<b>Memory Size:</b> 500,000 gates
<b>Description:</b> Smartfusion FPGA Fabric	<b>Reference Designation:</b> U51
<b>Memory Function:</b> Fan controller FPGA Fabric firmware image	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM tied to SHMM I2C Bus	<b>Reference Designation:</b> U3
<b>Memory Function:</b> Board manufacturing ID	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> Flash Memory	<b>Memory Size:</b> 280 KB
<b>Description:</b> MAX10 Chassis Power Controller	<b>Reference Designation:</b> U7
<b>Memory Function:</b> Chassis power controller operating firmware	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 256 Kb
<b>Description:</b> EEPROM tied to SHMM I2C Bus	<b>Reference Designation:</b> U203
<b>Memory Function:</b> Board manufacturing ID	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> PEX8796 PCIe Switch EEPROM (Gen3 Image)	<b>Reference Designation:</b> U6
<b>Memory Function:</b> Stores PCIe switch configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> PEX8796 PCIe Switch EEPROM (Gen1 Image)	<b>Reference Designation:</b> U10
<b>Memory Function:</b> Stores PCIe switch configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM in PSU	<b>Reference Designation:</b>
<b>Memory Function:</b> Stores power supply manufacturing data	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> None	

## Embedded System Module (ESM)

<b>Memory Type:</b> DDR2 SDRAM	<b>Memory Size:</b> 64 MB
<b>Description:</b> Chassis Shelf Manager Module Memory	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager operating RAM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> Y
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 128 MB
<b>Description:</b> Chassis Shelf Manager Module Flash	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager operating firmware and non-volatile system settings	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SRAM	<b>Memory Size:</b> 128 KB
<b>Description:</b> Chassis Shelf Manager Module Processor SRAM	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager CPU internal SRAM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> Y
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> ROM	<b>Memory Size:</b> 128 KB
<b>Description:</b> Chassis Shelf Manager Module Processor ROM	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager CPU internal ROM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SRAM	<b>Memory Size:</b> 16 KB
<b>Description:</b> Chassis Shelf Manager Module ARM CPU SRAM	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager firmware operating RAM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> Y
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> Flash	<b>Memory Size:</b> 128 KB
<b>Description:</b> Chassis Shelf Manager Module ARM CPU Flash	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager firmware image	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> FPGA Fabric	<b>Memory Size:</b> 60,000 gates
<b>Description:</b> Chassis Shelf Manager Module FPGA Fabric	<b>Reference Designation:</b> CN9
<b>Memory Function:</b> Chassis shelf manager FPGA Fabric firmware image	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to PEX8749 PCIe Switch (Gen3 Image)	<b>Reference Designation:</b> U19
<b>Memory Function:</b> Stores PCIe switch configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to PEX8749 PCIe Switch (Gen1 Image)	<b>Reference Designation:</b> U20
<b>Memory Function:</b> Stores PCIe switch configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to PEX8734 PCIe Switch (Gen1 Image)	<b>Reference Designation:</b> U74
<b>Memory Function:</b> Stores PCIe switch configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to PEX8734 PCIe Switch (Gen3 Image)	<b>Reference Designation:</b> U75
<b>Memory Function:</b> Stores PCIe switch configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 128 Mb
<b>Description:</b> Flash Tied to Artix-7 FPGA (Backup)	<b>Reference Designation:</b> U55
<b>Memory Function:</b> Trigger FPGA firmware image (backup)	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 128 Mb
<b>Description:</b> Flash Tied to Artix-7 FPGA (Main)	<b>Reference Designation:</b> U58
<b>Memory Function:</b> Trigger FPGA firmware image (main)	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	



<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to Artix-7	<b>Reference Designation:</b> U54
<b>Memory Function:</b> Stores VCXO calibration constant	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 128 Mb
<b>Description:</b> Flash Tied to VSC7512 LAN Switch	<b>Reference Designation:</b> U28
<b>Memory Function:</b> LAN switch firmware	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 16 Mb
<b>Description:</b> Flash Tied to I210 PCIe Network Interface Controller (NIC)	<b>Reference Designation:</b> U26
<b>Memory Function:</b> LAN Network Interface Controller (NIC) configuration	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> SRAM	<b>Memory Size:</b> 64 KB
<b>Description:</b> Board Management Controller (BMC) Microcontroller Memory	<b>Reference Designation:</b> BU1
<b>Memory Function:</b> Board Management Controller (BMC) operating RAM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> Y
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> Flash	<b>Memory Size:</b> 256 KB
<b>Description:</b> Board Management Controller (BMC) Microcontroller Flash	<b>Reference Designation:</b> BU1
<b>Memory Function:</b> Board Management Controller (BMC) operating firmware	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> EEPROM	<b>Memory Size:</b> 2 KB
<b>Description:</b> Board Management Controller (BMC) Microcontroller EEPROM	<b>Reference Designation:</b> BU1
<b>Memory Function:</b> Board Management Controller (BMC) operating firmware	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to MCU	<b>Reference Designation:</b> U131
<b>Memory Function:</b> Board Management Controller (BMC) configuration information	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> I2C EEPROM	<b>Memory Size:</b> 64 Kb
<b>Description:</b> EEPROM Tied to ShMM	<b>Reference Designation:</b> U53
<b>Memory Function:</b> ESM FRU and manufacturing data	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 16 Mb
<b>Description:</b> Flash Tied to Thunderbolt Controller	<b>Reference Designation:</b> U2
<b>Memory Function:</b> Thunderbolt controller firmware	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Firmware upgrade procedure	

### Integrated Controller (Option BC1)

<b>Memory Type:</b> eMMC	<b>Memory Size:</b> 14 GB
<b>Description:</b> Firmware	
<b>Memory Function:</b> Contains firmware	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> eMMC	<b>Memory Size:</b> 2 GB
<b>Description:</b> Ethernet settings	
<b>Memory Function:</b> Contains customer IP settings and saved measurement configs	
<b>User Modifiable (Y/N):</b> Y	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> Reset IP settings and send *RST SCPI	

<b>Memory Type:</b> LPDDR4	<b>Memory Size:</b> 4 GB
<b>Description:</b> RAM for processor	
<b>Memory Function:</b> Firmware operating RAM	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> Y
<b>Memory Erase Processes:</b> None	

<b>Memory Type:</b> SPI Flash	<b>Memory Size:</b> 8 MB
<b>Description:</b> Flash tied to processor	
<b>Memory Function:</b> Stores manufacturing data	
<b>User Modifiable (Y/N):</b> N	<b>Volatile (Y/N):</b> N
<b>Memory Erase Processes:</b> None	

## 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.

<b>Description and purpose</b>	<b>Shelf Manager memory contains the Dynamic Minimum Fan Level settings. The Dynamic Minimum Fan Level settings can be modified by the user.</b>
Size	64 Mbyte Flash contains the user modifiable settings.
Memory clearing	Use the same procedure documented below in Memory sanitization.
Memory sanitization	<p>Before proceeding, you may want to turn off the chassis and unplug the modules so that the low Dynamic Minimum Fan Level will remain in effect once set. Then power on the chassis and follow the steps below.</p> <p>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:</p> <ol style="list-style-type: none"> <li>1 Start the Monitor Soft Front Panel of the chassis.</li> <li>2 Under the Dynamic Minimum Fan Level setting, select the new level to be 10, which is the factory default level.</li> <li>3 The new value will automatically be set. You may exit the Monitor Soft Front Panel .</li> </ol> <p>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; (i.e. “use same procedure as for sanitization”).</p>
Memory removal	This memory can not be removed without damaging the instrument.

Description and purpose	Shelf Manager memory contains the power on state for the system module settings. A custom power on state can be saved by the user.
Size	64 Mbyte Flash contains the user modifiable settings.
Memory clearing	Use the same procedure documented below in Memory sanitization.
Memory sanitization	<p>Overwrite the power on state in the 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:</p> <ol style="list-style-type: none"> <li>1 Start the Monitor Soft Front Panel of the chassis.</li> <li>2 Select the <b>Utilities</b> menu, and click <b>Manage State &gt; Reset to Factory State</b>.</li> <li>3 A warning dialog will now come up, informing you that the system module will be set to the Factory Default state. Click <b>OK</b> to accept that action.</li> <li>4 Select the <b>Utilities</b> menu again, and click <b>Manage State &gt; Save as Power On State</b>. You may exit the Monitor Soft Front Panel .</li> </ol> <p>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; (i.e. “use same procedure as for sanitization”).</p>
Memory removal	This memory can not be removed without damaging the instrument.

Description and purpose	Integrated Controller (BC1 Option) Ethernet Settings
Size	2 GB (combined with saved measurement configurations) contains user modifiable settings.
Memory clearing	Use the same procedure documented below in Memory sanitization.
Memory sanitization	Press IP reset button on front of ESM module for 5 seconds. Default IP settings will be set.
Memory removal	This memory can not be removed without damaging the instrument.

Description and purpose	Integrated Controller (BC1 Option) Saved Measurement Configuration
Size	2 GB (combined with ethernet settings) contains user modifiable settings.
Memory clearing	Use the same procedure documented below in Memory sanitization
Memory sanitization	Send *RST SCPI to remove all user measurement settings.
Memory removal	This memory can not be removed without damaging the instrument.

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This information is subject to change without notice.

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