

Keysight  
N9321C/N9322C/N9323C/N9324C  
Spectrum Analyzer

 CoreTek 克達科技

是德科技授權經銷商

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# Notices

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## Safety Notices

### CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like 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

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## Warranty

This Keysight technologies instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, Keysight Technologies will, at its option, either repair or replace products that prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by Keysight Technologies. Buyer shall prepay shipping charges to Keysight Technologies, and Keysight Technologies shall pay shipping charges to return the product to Buyer. For products returned to Keysight Technologies from another country, Buyer shall pay all shipping charges, duties, and taxes.

## Where to Find the Latest Information

Documentation is updated periodically. For the latest information about these products, including instrument software upgrades, application information, and product information, see the following URLs:

<http://www.keysight.com/find/n9321c>

<http://www.keysight.com/find/n9322c>

<http://www.keysight.com/find/n9323c>

<http://www.keysight.com/find/n9324c>

To receive the latest updates by E-mail, subscribe to Keysight E-mail Updates:

<http://www.keysight.com/find/emailupdates>

Information on preventing instrument damage can be found at:

<http://www.keysight.com/find/tips>

## Is your product software up-to-date?

Periodically, Keysight releases software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Keysight Technical Support web site at:

<http://www.keysight.com/find/techsupport>



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# 1 Contacting Keysight Sales and Service Offices

Assistance with test and measurement needs, and information to help you find a local Keysight office, is available via the internet at, <http://www.keysight.com/find/assist>. If you do not have internet access, please contact your designated Keysight representative.

In any correspondence or telephone conversation, refer to the instrument by its model number and full serial number. With this information, the Keysight representative can determine whether your unit is still within its warranty period.



## 2 Products Covered by this Document

### Model Numbers

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N9321C

N9322C

N9323C

N9324C

This document describes instrument memory types and security features. It provides a statement regarding the volatility of all memory types, and specifies the steps required to declassify an instrument through memory clearing, or sanitization

For additional information, go to:

<http://www.keysight.com/find/security>



### 3 Security Terms and Definitions

Term	Definition
<b>Clearing</b>	As defined in Section 8-301a of DoD 5220.22-M, “National Industrial Security Program Operating Manual (NISPOM)”, 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.
<b>Instrument Declassification</b>	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 or memory removal, or both. Keysight declassification procedures are designed to meet the requirements specified in DoD 5220.22-M, “National Industrial Security Program Operating Manual (NISPOM)”, Chapter 8.
<b>Sanitization</b>	As defined in Section 8-301b of DoD 5220.22-M, “National Industrial Security Program Operating Manual (NISPOM)”, 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 specified in the “Clearing and Sanitization Matrix” in Section 5.2.5.5.5 of the ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM.
<b>Secure Erase</b>	Secure Erase is a term that is used to refer to either the clearing or sanitization features of Keysight instruments.



## 4 Instrument Memory & Volatility

This chapter summarizes all memory types in the instrument, and the descriptions below are divided between:

1. Non-Volatile Memory
2. Volatile Memory

## Non-Volatile Memory

This section contains information on the non volatile memory components available in your instrument. It provides details of the size of each memory component, its type, how it is used, its location, and the sanitization procedure.

The instrument contains no user-accessible non-volatile memory. For this reason, as indicated in the tables below, no sanitization procedure is required for any memory component..

Table 4-1 Summary of Non-Volatile instrument memory

<b>Memory Component, Type and Size</b>	<b>Writable During Normal Operation?</b>	<b>Data Retained When Powered Off?</b>	<b>Purpose/Contents</b>	<b>Data Input Method</b>	<b>Location in Instrument and Remarks</b>	<b>Sanitization Procedure</b>
1. Control Board Firmware Flash Memory 64 MByte	No	Yes	Contains Operating System, Instrument Software, Factory Backup Calibration Data, Crash recovery image.	Programmed before installation or by factory or service center calibration procedure software, or by upgrade installation software.	A3 Digital Assembly	None.
2. Control Board User Flash Memory 64 MByte	Yes	Yes	User instrument states, user data files, user trace data and any other measurement result.	Measurement results and Settings can be toggled by user.	A3 Digital Assembly	See Table 6-1 on page 17.
3. Control Board Parameter EEPROM Memory 128 Byte	No	Yes	Reserved for future use.	None	A3 Digital Assembly	None

Table 4-1 Summary of Non-Volatile instrument memory

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
4. RF Board Flash Memory 2*512 KByte for N9321C & N9322C 1 MByte + 512 KByte for N9323C & N9324C	No	Yes	Used to store the RF board calibration data.	Programmed before installation or by factory.	A4 RF Assembly	None
5. TG Board Flash Memory 512 KByte	No	Yes	Used to store the TG board calibration data.	Programmed before installation or by factory	A5 TG Assembly	None

## Volatile Memory

The volatile memory in the instrument does not have battery backup. It does not retain any information when turn off the instrument.

Removing power from this memory meets the memory sanitization requirements specified in the “Clearing and Sanitization Matrix” in Section 5.2.5.5.5 of the [ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM](#).

**Table 4-2** Summary of Volatile Instrument Memory - Instruments with Single-Core and Dual-Core Processors

Memory Type and Size	Writable During Normal Operation? Data Retained When Powered Off?		Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Control Board SDRAM 64 MByte	Yes	No	Main dynamic RAM memory for processor.  Contains working copies of operating system, instrument measurement applications, calibration data, and measurement data.	programmed via firmware or operation system. Not accessible by user.	A3 Digital Assembly  This memory is not battery backed-up or connected to standby power.	Turn off instrument power.
2. Micro-processor Cache 32 MByte	Yes	No	MCU Cache	Programmed by firmware and operating System. Not accessible by user.	A3 Digital Assembly  This memory is not battery backed-up or connected to standby power.	Turn off instrument power.
3. DSP on-chip RAM 3 MBit	Yes	No	DSP on-chip RAM for temporary measurement data	Programmed by firmware and Operation System	A3 Digital Assembly  This memory is not battery backed-up or connected to standby power.	Turn off instrument power.

## 5 Memory Clearing, Sanitization and Removal Procedures

This section explains how to clear, sanitize, memory from your instrument, for all types of non-volatile memory that can be written to during normal instrument operation.

Table 5-1 Control Board User Flash Memory

<b>Description and Purpose</b>	<p>The Control Board User Flash Memory is the main memory for the user data. It has very fast read and write speed, and there is no limitation on the number of read/write cycles.</p> <p>It contains the user instrument states, user data files, user trace data and any other measurement result.</p>
<b>Size</b>	64 M bytes
<b>Memory Clearing</b>	<p>Software utilities are available that comply with the clearing requirements specified for Magnetic Disks in the “Clearing and Sanitization Matrix” in Section 5.2.5.5.5 of the <a href="#">ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM</a>.</p>
<b>Memory Sanitization</b>	<p>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 specified in the “Clearing and Sanitization Matrix” in Section 5.2.5.5.5 of the <a href="#">ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM</a>.</p> <p>The memory sanitization process please refer to the "Memory Sanitization Process" on the next page.</p>
<b>Memory removal</b>	Not applicable.
<b>Write protecting</b>	Not applicable.
<b>Memory validation</b>	Not applicable.

## Memory Sanitization Procedures

This section includes process that describe how to sanitize a instrument by option SEC. The option SEC offers the security erase function to implement low-level and unrecoverable erase of Control Board User Flash Memory. The Control Board Flash Memory remains intact so the security erase function doesn't interface with normal operation of the instrument.

### The Operation Process To Trigger Security Sanitization Function

The following process gives the instructions on how to use the security erase function. Press the following keys:

- Shift.
- System Mode
- More 1 of 2
- Securities
- Erase Memory
- Enter, and wait for the instrument to reboot and begin normal operation. It will take several minutes.

### Memory Sanitization Procedure

- The embedded erase algorithm on the Flash memory programs and verifies the entire memory to an all zero pattern.
- Perform the electrical erase, then program the entire memory to all one pattern. After that all locations within the erased sector contain FFFFh.
- Re-create a file system on the User Flash Memory so that the flash can be recognized by the operation system.
- Reboot the instrument after erase operation.

### Determining Instrument Firmware Revision

- On the instrument, press System > System Info > Show System.
- The "Show System" display appears as below figure 6-1 shows, and look for the firmware revision number specified in the "MCU Firmware Version" entry.

## Appendix A: References

1. DoD 5220.22-M, “National Industrial Security Program Operating Manual (NISPOM)”  
United States Department of Defense. Revised February 28, 2006.  
May be downloaded in Acrobat (PDF) format from:  
[http://www.dss.mil/isp/fac\\_clear/download\\_nispom.html](http://www.dss.mil/isp/fac_clear/download_nispom.html)
2. ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM  
Defense Security Service.  
DSS-cleared industries may request a copy of this document via email, by following the instructions at:  
<http://www.dss.mil/isp/odaa/request.html>