

Agilent Signal Generators

This manual provides documentation for the following instruments:

MXG Signal Generator (Series A and B)

EXG Signal Generator

PSG Signal Generator

ESG Signal Generator

Security Features and Document of Volatility



Notices

© Agilent Technologies, Inc. 2004-2014

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Trademark Acknowledgements

Adobe Acrobat® and Reader® are US registered trademarks of Adobe Systems Incorporated.

Adobe® PDF is a trademark of Adobe Systems Incorporated.

Greenliant and NANDrive are trademarks of Greenliant Systems Ltd.

Manual Part Number

E4400-90621

Print Date

February 2014

Supersedes: August 2012

Printed in USA

Agilent Technologies Inc. 1400 Fountaingrove Parkway Santa Rosa, CA 95403

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a US Government prime contract or subcontract, Software is delivered and licensed as "Commercial computer software" as defined in DFAR 252.227-7014 (June 1995), or as a "commercial item" as defined in FAR 2.101(a) or as "Restricted computer software" as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies' standard commercial license terms, and non-DOD Departments and Agencies of the US Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). US Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

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

A **WARNING** 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 personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Warranty

This Agilent 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, Agilent 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 Agilent Technologies. Buyer shall prepay shipping charges to Agilent Technologies, and Agilent Technologies shall pay shipping charges to return the product to Buyer. For products returned to Agilent 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.agilent.com/find/mxg

http://www.agilent.com/find/exg

http://www.agilent.com/find/psg

http://www.agilent.com/find/esg

To receive the latest updates by email, subscribe to Agilent Email Updates:

http://www.agilent.com/find/emailupdates

Information on preventing instrument damage can be found at:

http://www.agilent.com/find/tips

Is your product software up-to-date?

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

http://www.agilent.com/find/techsupport

1 Table of Contents

2. Contacting Agilent Sales and Service Offices
3. Products Covered by this Document 9 Document Purpose 10 Recommended Software Upgrades 11
4. Security Terms and Definitions
5. Instrument Memory & Volatility. 15 MXG (Series B) & EXG Memory 16 MXG (Series A) Memory 19 ESG and PSG Memory 23
6. Memory Clearing, Sanitization and Removal Procedures 29 Erase All 30 Erase and Overwrite All 31 Erase and Sanitize All 32 Force Internal to SD Card 33 Clear Persistent State Information 34 Persistent State 34 Instrument Setup 34 User IQ Cal File (Vector Models Only) 34
7. Using Secure Mode
8. Using Secure Display
9. Security Issues for Certain Firmware Revisions 39 Firmware Update Procedure 39 Error Messages and Secure Environments 40 Recovering Erased System Files 41
10. Procedure for Declassifying a Faulty Instrument
Appendix A. References

Contents



Contacting Agilent Sales and Service Offices

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

NOTE

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

Contacting Agilent Sales and Service Offices



Products Covered by this Document

Product Family Name	Product Name	Model Number	Firmware Revision		
X-Series Signal Generators	MXG Microwave Analog Signal Generator	N5183B	All		
	MXG RF Vector Signal Generator	N5182B	All		
	MXG RF Analog Signal Generator	N5181B	All		
	EXG Microwave Analog Signal Generator	N5173B	All		
	EXG RF Vector Signal Generator	N5172B	All		
	EXG RF Analog Signal Generator	N5171B	All		
	MXG Signal Generator	N5183A	All		
	(Series A)	N5182A			
		N5181A			
		N5162A ^a			
		N5161A ^a			

Product Family Name	Product Name	Model Number	Firmware Revision
Agilent Signal Generators	PSG Signal Generator	E8663D	All
		E8663B ^b	All
		E8267D ^b	All
		E8267C	C.03.40 or higher
		E8257N	All
		E8257D ^b	All
		E8257C	C.03.40 or higher
		E8247C	C.03.40 or higher
	ESG Signal Generator	E4438C ^b	C.03.40 or higher
		E4428C ^b	All

- a. For the N5161A/62A Signal Generators, the softkey menus and features described in this guide are only available through the web-enabled interface or via SCPI commands. Refer to the instrument Installation Guide, Programming Guide and SCPI Programmers Reference for more information.
- b. See "Recommended Software Upgrades" on page 11 for important firmware version information.

Document Purpose

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, sanitization, or removal.

For additional information, go to:

http://www.agilent.com/find/security

IMPORTANTBe sure that all information stored by the user in the instrument that needs to be saved
is properly backed up before attempting to clear any of the instrument memory. Agilent
Technologies cannot be held responsible for any lost files or data resulting from the
clearing of memory.Be sure to read this document entirely before proceeding with any file deletion or
memory clearing.

Recommended Software Upgrades

The information in this section applies only to **PSG** and **ESG** Signal Generators.

CAUTIONDo not use the Erase All, Erase and Overwrite All, Erase and Sanitize All, Erase,
Overwrite, or Sanitize procedures with any of the firmware revisions listed in Table 3-1
below.
If your instrument's current firmware revision is among those listed, please upgrade
immediately to newer firmware. For details, see "Firmware Update Procedure" on
page 39.Table 3-1Firmware revisions that require upgradesInstrument model numberCurrent firmware revisionUpgrade to firmware revision

E44x8C	C.04.84, C.04.86, C.04.95	C.04.96 or later
E82x7D	C.04.81, C.04.85, C.04.92	C.04.94 or later
E8663B	C.04.90	C.04.93 or later

Products Covered by this Document **Recommended Software Upgrades**



4 Security Terms and Definitions

Term	Definition
Clearing	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 in an environment that provides an acceptable level of protection for the data that was on the media before clearing. Hence, clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.
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 or memory removal, or both. Agilent declassification procedures are designed to meet the requirements specified in DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", Chapter 8.
Sanitization	As defined in Section 8-301b of DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", sanitization is the process of removing the data from media before reusing the media in an environment that does not provide an acceptable level of protection for the data that was in the media before sanitizing. Hence, 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.
	Agilent 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 of the ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM.
Secure Erase	Secure Erase is a term that is used to refer to either the clearing or sanitization features of Agilent instruments.

Security Terms and Definitions



This chapter contains information on the memory components in your instrument.

The tables provide details of the size of each memory component, its type, how it is used, its location, volatility, and the sanitization procedure. Details are subdivided by Product Name as follows:

- "MXG (Series B) & EXG Memory" on page 16
- "MXG (Series A) Memory" on page 19
- "ESG and PSG Memory" on page 23

Table 5-1

MXG (Series B) & EXG Memory

The following tables describe each memory type used in the base instrument and optional baseband generator.

Base Instrument (All models and options)

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
1. Main Memory (DRAM) 512 MByte	Yes	No	Firmware operating memory.	Operating system	CPU board, not battery backed. Volatile memory.	Turn off instrument power.
 2. Main Memory (Flash) 512 MByte, partitioned as follows: 200 MByte: Boot (Main firmware image, Operating system) 50 MByte: System (Calibration/ Configuration) 1 MByte: Secure Storage 180 MByte: User 	Yes	Yes	Factory calibration and configuration data User file system ^a , which includes flatness calibration, instrument states, and sweep lists	Firmware upgrades and user-saved data ^a	CPU board	Boot Area: no user data User and Secure Storage Areas: see "Erase and Sanitize All" on page 32.
3. Front Panel Memory (Flash) 24 KByte	No	Yes	Front panel keyboard controller firmware	Operating system	Front Panel board	None required (no user data)

Memory Component, Type and Size	Writable During	Normal Operation? Data Retained When	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
4. Front Panel Memory	Yes	No	Front panel operatin memory	g Front panel firmware	Front Panel board	Turn off instrument
(SRAM)					Volatile	power.
2 KByte					memory.	
5. Front Panel Memory	No	Yes	Unused	None	Front Panel board	None required
(EEPROM)						
256 Byte						
6. SD Card (Option 006)	Yes	Yes	Optional storage of User data	User-saved data	Removable card may	None required
(Flash)					be retained in Secure	
8 GByte					Area	
a. Analog instru	iments	s only				
Table 5-2	Vec	tor Mod	lels with Baseband Gen	erator		
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
1. Waveform N Memory	Yes	No	Waveforms (including header and marker	Normal user operation	Volatile memory.	Turn off instrument
(DRAM)			data)		Not battery	power.
1 GByte					backed.	

Table 5-1Base Instrument (All models and options)

Instrument Memory & Volatility MXG (Series B) & EXG 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
2. Extended Persistent Memory	Yes	Yes	All user data	Normal user operation		See "Erase and Sanitize All" on
(Flash SSD)						page 32.
40 GByte, partitioned as follows:						
4 GByte: Apps						
4 GByte: Base User						
Remainder: Optional Extended User						
Calibration Data Memory	No	Yes		Factory or service only		None required (no
(Flash)						user data)
128 KByte						

Sanitize All" on

page 32.

MXG (Series A) Memory

The following tables describe each memory type used in the base instrument and optional baseband generator.

Table 5-3	Base	e Instr	ument (All models and	'All models and options)			
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	
1. Main Memory (DRAM) 32 MByte	Yes	No	Firmware operating memory no user data	Operating system	CPU board, not battery backed.	Turn off instrument power.	
2. Main Memory (Flash) 8 MByte	Yes	Yes	Factory calibration/ configuration data User file system ^a , which includes flatness calibration, instrument states, and sweep lists	Firmware upgrades and user-saved data ^a	CPU board (same chip as firmware memory, but managed separately)	Because this memory chip contains 8 MB of user data (described here) and 8 MB of firmware memory, a full-chip erase is not desirable.	
						User data areas are selectively and completely sanitized by the procedure "Erase and	

Instrument Memory & Volatility MXG (Series A) Memory

Table 5-3	Base Instrument (All models and options)						
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	
3. Firmware Memory (Flash) 8 MByte	No	Yes	Main firmware image	Factory installed or firmware upgrade During normal operation, this memory cannot be overwritten.	CPU board (same chip as main flash memory, but managed separately)	Because this memory chip contains 8 MB of user data and 8 MB of firmware memory (described here), a full-chip erase is not desirable. User data areas are selectively and completely sanitized by the procedure "Erase and Sanitize All" on page 32.	
4. Bootrom Memory	No	Yes	CPU bootup parameters	Factory programmed	CPU board	None required (no user data)	
(EEPROM) 8 KByte	Yes	Yes	LAN configuration	Front panel entry or remotely	During normal operation, this memory cannot be overwritten or erased except for LAN configuration. This read-only data is programmed at the factory.		

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
5. Calibration Data (Flash)	No	Yes	Factory calibration and configuration data backup	Factory or service only	RF Board	None required (no user data)
256 KByte						
6. LCD Display Memory (DRAM)	No	No	Display buffer	Operating system	RF board, not battery backed.	Turn off instrument power.
160 KByte						
7. Front Panel Memory	No	Yes	Front panel keyboard controller firmware	Operating system	Front Panel board	None required (no user data)
(Flash)						
32 KByte						
a. Analog inst	rument	s only				
Table 5-4	Vec 654	ctor Mo !)	dels with Baseband Gen	erator (N5162A/	N5182A with Opt	ions 651, 652, or
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
1. Waveform Memory (DRAM) ≤ 320 MByte	Yes	No	Waveforms (including header and marker data)	Normal user operation	Not battery backed.	Turn off instrument power.

Table 5-3Base Instrument (All models and options)

Instrument Memory & Volatility **MXG (Series A) Memory**

Table 5-4Vector Models with Baseband Generator (N5162A/N5182A with Options 651, 652, or
654)

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
2. Extended Persistent Memory	Yes	Yes	All user data	Normal user operation		User data is completely sanitized by the
(Flash) ^a						procedure "Erase and
4 GByte						Sanitize All" on page 32.
3. Calibration Data Memory	No	Yes	No user data	Factory or service only		None required (no user data)
(Flash)						
128 KByte						

a. For serial numbers lower than MY/US/SG4818xxxx, the persistent memory value is 512 MByte.

ESG and PSG Memory

The following tables describe each memory type used in the base instrument, optional baseband generator, optional hard disk and option flash drive.

Table 5-5	Base Instrument (All models and options)					
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 ^a
1. Main	Yes	No	Firmware operating	Operating	CPU board.	Turn off
Memory			memory	system (not user)	Not battery instrum	instrument power.
(SDRAM)				1	backed.	
64 MByte						
2. Main Memory	Yes	Yes	Factory calibration/ configuration data	Firmware upgrades and	CPU board (same chip as firmware	Because this 32 MB memory chip contains
(Flash)			User file system,			
20 MByte			which includes instrument status	data	managed	data (described
			backup, flatness		separately) User data is not stored in this memory if hard disk (Option 005) or flash drive (Option 008/009) is installed.	here) and 12 MB of firmware memory, a selective chip erase is performed.
			calibration, IQ calibration, instrument states, waveforms (including			
			data), modulation			User data areas
			definitions, and sween lists			are selectively and completely
						sanitized by the
						procedure "Erase and
						Sanitize All" on
						page 32.

Instrument Memory & Volatility ESG and PSG Memory

	2			<i>p</i>)		
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 ^a
3. Firmware Memory (Flash)	No	Yes	Main firmware image	Factory installed or firmware upgrade	CPU board (same chip as main flash memory, but	Because this 32 MB memory chip contains 20 MB of user
12 MByte	Yes	Yes	LAN configuration	Front panel entry or remotely	managed separately) During normal operation, this memory cannot be overwritten except for LAN configuration.	data and 12 MB of firmware memory (described here), a selective chip erase is performed. User data areas are selectively and completely sanitized by the procedure "Erase and Sanitize All" on page 32.
4. Battery Backed Memory (SRAM) 512 KByte	Yes	Yes	User-editable data (table editors) Last instrument state, last instrument state backup, and persistent instrument state and instrument status	Firmware operations	CPU board The battery is located on the motherboard for the ESG and on the CPU board for the PSG.	Sanitized by the procedure described in "Erase and Sanitize All" on page 32.
5. Bootrom Memory (Flash) 128 KByte	No	Yes	CPU bootup program and firmware loader/updater	Factory programmed	CPU board During normal operation, this memory cannot be overwritten or erased.	None required (no user data)

Table 5-5Base Instrument (All models and options)

Memory Component, Type and Size	Writable During Normal Operation? Data Retained When	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure ^a
6. Calibration Backup Memory	No Yes	Factory calibration/ configuration data backup	Factory or service only	Motherboard	None required (no user data)
(Flash)					
512 KByte					
7. Boards Memory	No Yes	Factory calibration and information files,	Factory or service only	All RF boards, baseband	None required (no user data)
(Flash)		code images, and self-test limits		generator, and motherboard	
512 Bytes				mothorsourd	
8. Micro- processor Cache (SRAM)	Yes No	CPU data and instruction cache	Memory is managed by CPU, not user	CPU board, not battery backed.	Turn off instrument power.

Tabla F F	Paga Instrument (All n	nodala and antianal
	Dase instituitient (All II	1000015 and 0ptions/

3 KByte

a. Sanitization procedures mentioned in this table are **not** available in E8257N instruments, unless Option 340 has been installed.

Table 5-6

Vector Models with Baseband Generator (E4438C/E8267D with Options 601 or 602)

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
1. Waveform Memory	Yes	No	Waveforms (including header and marker	Normal user operation	Not battery backed.	User data is completely
(SDRAM)			data) and PRAM			sanitized by the
40 MByte– 320 MByte						"Erase and Sanitize All" on page 32.

Table 5-6	Vector Models with Baseband Generator (E4438C/E8267D with Options 601 or 602)					ions 601 or 602)
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
2. BBG Firmware Memory (Flash) 32 MByte	No	Yes	Firmware image for baseband generator	Firmware upgrade		None required (no user data)
3. Coprocessor Memory (SRAM) 32 MByte	Yes	No	Operating memory of baseband coprocessor CPU	During normal operation, some user information, such as payload data, can remain in the memory.	This memory is used during normal baseband generator operation. It is not directly accessible by the user. Not battery backed.	Turn off instrument power.
4. Buffer Memory (SRAM) 5 x 512 KByte	No	No	Support buffer memory for ARB and real-time applications	Normal user operation	This memory is used during normal baseband generator operation. It is not directly accessible by the user. Not battery backed.	Turn off instrument power.

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
1. Media Storage (Built-in Hard Disk) 6 GByte or 10 GByte (4 GByte usable in both cases)	Yes	Yes	User files, including flatness calibrations, IQ calibration, instrument states, waveforms (including header and marker data), modulation definitions, and sweep lists	User-saved data	The hard disk is an option for vector instruments (E4438C Option 005, E8267D Option 005, and E8267C Option 005) and is therefore not installed in some instruments. If it is installed, these files are stored on the hard disk instead of in flash memory.	The magnetic residue requires several rewrite cycles or drive removal and destruction. User data is completely sanitized by the procedure "Erase and Sanitize All" on page 32.
2. Buffer Memory (DRAM)	No	No	Buffer (cache) memory	Normal operation, via hard disk		Turn off instrument power.

Table 5-7Hard Disk (E4438C/E8267C/E8267D with Option 005)

512 KByte

Table 5-8

Flash Drive (E8257N with Options 008 and 340, E8257D/E8663D with Option 008, and E8267D with Option 009)

Memory Component, Type and Size	Writable During Normal Operation? Data Retained When	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Memory Storage (Removable Flash drive) Size varies	Yes Yes	User files, including flatness calibrations, IQ calibration, instrument states, waveforms (including header and marker data), modulation definitions, and sweep lists	User-saved data	The flash drive, E8267D Option 009, replaces the hard drive, E8267D Option 005, on E8267D instruments with serial prefixes ≥ US/MY4829. It is, therefore, not installed in some instruments. If it is installed, these files are stored on the flash drive instead of in flash memory	User data is completely sanitized by the procedure "Erase and Sanitize All" on page 32. ^a

a. Removing the Flash Drive card from an instrument with one of these options sanitizes the instrument, but also renders it inoperative for data collection, calibration, repair, etc.



Memory Clearing, Sanitization and Removal Procedures

This chapter describes several security functions you can use to remove sensitive data stored in the instrument before moving it from a secure development environment. The functions described are:

- "Erase All" on page 30
- "Erase and Overwrite All" on page 31
- "Erase and Sanitize All" on page 32
- "Force Internal to SD Card" on page 33
- "Clear Persistent State Information" on page 34

NOTE	The functions described in this chapter are not available in the E8257N instrument, unless Option 340 has been installed.				
CAUTION	These functions do not erase or sanitize external media connected to the instrument's USB port.				
CAUTION	(This information applies only to PSG and ESG Signal Generators.)				
	Do not use the Erase AII, Erase and Overwrite AII, Erase and Sanitize AII, Erase , Overwrite , or Sanitize procedure with any of these firmware revisions:				
	E44x8C: C.04.84, C.04.86, C.04.95				
	E82x7D: C.04.81, C.04.85, C.04.92				
	E8663B: C.04.90				
	If your instrument's current firmware revision is among those listed above, please upgrade immediately to newer firmware. For details, see "Firmware Update Procedure" on page 39.				

Memory Clearing, Sanitization and Removal Procedures **Erase All**

Erase All

This function removes all user files, user flatness calibrations, user I/Q calibrations, and resets all table editors with original factory values, ensuring that user data and configurations are not accessible or viewable. The instrument appears as if it is in its original factory state, however, the memory is not sanitized. This action is relatively quick, typically taking less than one minute (the exact time depends on the number of files).

Model	Key Sequence
MXG (Series A/B)	File > More > Security > Erase All > Confirm Erase
EXG	
PSG	Utility > Memory Catalog > More > Security > Erase All > Confirm Erase
ESG	

Note that there is a similar but distinct function, as described below, that deletes all user files but does **not** reset the table editors:

Model	Key Sequence
MXG (Series A/B)	File > Delete All Files
EXG	
PSG	Utility > Memory Catalog > More > Delete All Files
ESG	

Erase and Overwrite All

This function is available in MXG Series A, PSG, and ESG instruments only. It is **not** available in MXG Series B and EXG instruments. Use Erase and Sanitize All instead.

This function performs the same actions as **Erase All**, plus it clears and overwrites various memory types, as described below.

Memory Type	Models	Description			
SRAM	Not MXG	All addressable locations are overwritten once with random			
(Battery- backed)		characters.			
CPU Flash	All	User data is erased with flash chip block-erase commands. No overwrite is performed. During erasure, the system files are temporarily moved to main memory and are then restored to CPU Flash when erasure is complete.			
Extended Persistent Memory	MXG N5162A/82A only	The file system is formatted, then all addressable locations are overwritten with random characters, and then the file system is reformatted again.			
(Flash)					
Hard Disk	PSG E8267C, E8267D with Option 005 only	All addressable locations are overwritten once with a random character.			
	ESG E4438C				
Flash Drive	PSG E8257N with Options 008 and 340	All addressable locations are overwritten once with a random character.			
	PSG E8257D, E8663D with Option 008				
	PSG E8267D with Option 009				
Model	Key Sequence				
MXG (Series A)	File > More > Sec	urity > Erase and Overwrite All > Confirm Overwrite			
PSG	Utility > Memory (Catalog > More > Security > Erase and Overwrite All >			
ESG	Confirm Overwrite				

Erase and Sanitize All

This function performs the same actions as **Erase All**, plus it clears and overwrites the various memory types, as described below.

Memory Type	Models	Description
SRAM	PSG, ESG only	All addressable locations are overwritten once with random
(Battery- backed)		characters.
CPU Flash (Main Memory)	MXG Series B EXG	User and "Secure Storage" partitions on CPU flash are erased by flash vendor firmware. For algorithm details, see the Application Note Greenliant NANDrive Security Erase Feature, Purge Command Specification.
CPU Flash	MXG Series A PSG ESG	User data is erased with flash chip block-erase commands. No overwrite is performed. During erasure, the system files are temporarily moved to main memory and are then restored to CPU Flash when erasure is complete.
Extended Persistent Memory (Flash)	MXG N5162A/82A only	The file system is formatted, then all addressable locations are overwritten with random characters, and then the file system is reformatted again. These actions are then repeated.
Hard Disk	PSG E8267C, E8267D with Option 005 only ESG E4438C	All addressable locations are overwritten with a random character three times.
Flash Drive	MXG N5182B EXG N5172B	Erased by drive vendor's firmware, which erases user data area, SSD reserve area, and retired blocks. The firmware accepts and implements the ATA commands SECURITY ERASE UNIT and ENHANCED ERASE MODE. For details of these commands, see AT Attachment 8 - ATA/ATAPI Command Set (ATA8-ACS).
Flash Drive	PSG E8257N with Options 008 and 340 PSG E8257D, E8663D with Option 008 PSG E8267D with Option 009	All addressable locations are overwritten with a random character three times.

NOTE	The Erase and Sanitize All operation resets the instrument's LAN settings to their factory defaults. For more details, see "LAN Setup" on page 34.	
Model	Key Sequence	
MXG (Series A/B)	File > More > Security > Erase and Sanitize All > Confirm Sanitize	
EXG		
PSG	Utility > Memory Catalog > More > Security > Erase and Sanitize All >	
ESG	Confirm Sanitize	

Force Internal to SD Card

This function is available only in the MXG Series B and EXG instruments.

The options for this setting are **Off** or **On**:

- **On**: Forces all internal settings and files to be stored only on the external SD memory card, including instrument states, user data files, sweep list files, and other user created files. If it becomes necessary to sanitize the instrument, these settings may then be securely retained by removing the SD card and retaining it in the secure area.
- **Off**: All internal settings are stored in the instrument's Main Memory (see "MXG (Series B) & EXG Memory" on page 16). This memory may be sanitized using the Erase and Sanitize All function.

 Model
 Key Sequence

 MXG (Series B)
 File > More > Security > Force Internal to SD Card

 EXG
 File > More > Security > Force Internal to SD Card

Clear Persistent State Information

Persistent State

The persistent state settings contain instrument setup information that can be toggled within predefined limits such as display intensity, contrast and the GPIB address. In vector models, the user IQ Cal is also saved in this area.

The following key sequences or SCPI commands can be used to clear the IQ Cal file and to set the operating states that are not affected by an instrument power-on, preset, or *RST command to their factory default:

Instrument Setup

Key Sequence MXG (Series A/B) Utility > EXG Values >	Utility > Power On/Preset > Restore System Settings to Default Values > Confirm Restore Sys Settings to Default Values		
	PSG	Utility > Power On/Preset > Restore System Defaults >	
ESG Confirm Restore Sys Defaults	Confirm Restore Sys Defaults		
SCPI Command	All Models	:SYSTem:PRESet:PERSistent	

LAN Setup

The LAN setup (hostname, IP address, subnet mask, and default gateway) information is not modified by an instrument power-on or *RST command. This information can be changed or cleared by entering new data, or can be reset to the factory default settings by performing an Erase and Sanitize All operation.

User IQ Cal File (Vector Models Only)

When a user-defined IQ Calibration has been performed, the cal file data is removed by setting the cal file to default, as follows:

Key Sequence	All Models	I/Q > I/Q Calibration > Revert to Default Cal Settings
SCPI Command	MXG (Series A/B)	:CAL:IQ:DEF
	EXG	
	PSG	:CAL:IQ:DEF
	ESG	:CAL:WBIQ:DEF



NOTE The "Secure Mode" procedure described here is available only for **MXG Series A**, **PSG** (except E8257N without Option 340) and **ESG** instruments. However, the immediate-action functions Erase All and Erase and Sanitize All are also available in MXG Series B and EXG Signal Generators, and achieve the same results.

Secure Mode automatically applies the selected **Security Level** action the next time the instrument's power is cycled.

To activate Secure Mode, do the following:

Step	Action	Notes	
1	Open the Security Level menu	For MXG (Series A), press: File > More > Security > Security Level	
		For ESG/PSG, press: Utility > Memory Catalog > More > Security > Security Level	
2	Select the Security Level	Available options:	
		 None – equivalent to a factory preset, no user information is lost 	
		• Erase – equivalent to Erase All	
		Overwrite – equivalent to Erase and Overwrite All	
		Sanitize – equivalent to Erase and Sanitize All	

Step	Action	Notes	
3	Activate Secure Mode	CAUTION	Once you activate secure mode (by pressing Confirm) , you cannot deactivate or decrease the Security Level; the erasure actions for the selected Security Level execute at the next power cycle. Once you activate Secure Mode, you can only increase the Security Level until you cycle power. For example, you can change Erase to Overwrite , but not the reverse.
			After the power cycle, the Security Level selection remains the same, but the secure mode is not activated.
		For MXG (Serie Secure Mode 2	es A), press: File > More > Security > Enter > Confirm
		For ESG/PSG, Security > Ent	press: Utility > Memory Catalog > More > er Secure Mode > Confirm
		The Enter Secu Secure Mode	ure Mode softkey changes to Activated.



NOTE Front panel control of this feature is **not** available on PSG E8257N instruments (unless Option 340 is installed), or on E82x7C instruments with firmware revisions earlier than C.03.76. The feature can be activated remotely, however, using SCPI commands. Refer to the "System Commands" chapter of the instrument's **SCPI Command Reference** for more information.

This function prevents unauthorized personnel from reading the instrument display or tampering with the current configuration via the front panel. When Secure Display is active, the display is blank, except for an advisory message, as shown in Figure 8-1 below. All front panel keys are disabled.

To set Secure Display, press: Utility > Display > More > Activate Secure Display > Confirm Secure Display

Once Secure Display has been activated, the power must be cycled to re-enable the display and front panel keys.



Figure 8-1 Signal Generator Screen with Secure Display Activated

Using Secure Display



Security Issues for Certain Firmware Revisions

The information in this chapter applies only to **PSG** and **ESG** Signal Generators.

If your ESG or PSG instrument currently has one of the firmware revisions listed in Table 9-1, using certain security features may cause the deletion of some of the instrument's system files. Before using the security features, update your firmware to the appropriate revision listed in the "Update to" column of Table 9-1.

Table 9-1	Firmware Revisions by Instrument Mo	del
-----------	-------------------------------------	-----

Model	Affected firmware revisions	Update to
E4428C	C.04.84, C.04.86, or C.04.95	C.04.96 or later
E4438C	C.04.84, C.04.86, or C.04.95	C.04.96 or later
E8257D	C.04.81, C.04.85, or C.04.92	C.04.94 or later
E8267D	C.04.81, C.04.85, or C.04.92	C.04.94 or later
E8663B	C.04.90	C.04.93 or later

Firmware Update Procedure

To obtain the latest firmware online, perform the following steps:

- Access the instrument's web page: www.agilent.com/find/<model_number> (Example: www.agilent.com/find/E4438C).
- 2. Under the **Technical Support Tab**, select **Drivers and Software**, and follow the remaining links to the firmware upgrade page.

If web access is not available, Agilent can provide the new firmware on CD-ROM. To obtain the CD-ROM, contact Agilent or your Agilent representative, as described in "Contacting Agilent Sales and Service Offices" on page 7.

Error Messages and Secure Environments

If you cannot upgrade the firmware prior to using the security features, Agilent will help you to recover from error messages that may appear after executing the security functions. The error messages indicate that instrument system files have been erased. The following list shows some possible error messages:

- 256, File name not found; /SYS/LICENSE.TXT
- 617, Configuration Error; License file not found. Creating empty one.
- A missing or damaged system file was encountered while trying to diagnose the system.

Even if these error messages appear, the security function has completely sanitized the instrument. If the instrument is located in a secure environment, it is safe to remove it. After removing it from the secure area, follow the process below to recover the lost system files.

Recovering Erased System Files

To recover the lost files, perform the following steps:

- 1. Obtain your instrument's model and serial number.
- 2. Contact Agilent and request a replacement license file.

The Agilent representative will ask for the model and serial number.

- 3. Update the firmware to the revision specified in the "Update to" column of Table 9-1 on page 39.
 - a. If problems occur when upgrading the firmware, manually enter as many license keys as possible using **Utilities Instrument Info > Options Info > Auxiliary Software Options**
 - b. Upgrade the firmware again.
- 4. Open Internet Explorer and enter http://<instrument IP address>/update.
- 5. Locate Recover Self-test System Files and click Execute.
- 6. Locate **Overwrite LICENSE.TXT**, cut and paste the replacement license file (obtained in Step 2) into the text box, and click **Execute**.
- 7. Cycle the power on the instrument.
- 8. If configuration errors persist after completing the previous steps, contact Agilent again.

Security Issues for Certain Firmware Revisions **Recovering Erased System Files**



10 Procedure for Declassifying a Faulty Instrument

If the instrument is not functional, and you are unable to use the security functions, you may physically remove the Processor board and Hard Disk or Solid State Drive (if installed).

For removal and replacement procedures, refer to the **Service Guide** for your instrument, as listed in Table 10-1 below.

Signal Generator Model	Link to Service Guide	
N5183B MXG Microwave Analog Signal Generator	http://cp.literature.agilent.com/litweb/pdf/N5180-90059.pdf	
N5182B MXG RF Vector Signal Generator (Series B)		
N5181B MXG RF Analog Signal Generator (Series B)		
N5173B EXG Microwave Analog Signal Generator		
N5172B EXG RF Vector Signal Generator		
N5171B EXG RF Analog Signal Generator		
N5161A/62A/81A/82A/83A MXG (Series A) Signal Generators	http://cp.literature.agilent.com/litweb/pdf/N5180-90006.pdf	
E4428C/38C ESG Signal Generators	http://cp.literature.agilent.com/litweb/pdf/E4400-90511.pdf	
E8257N, E8257D/67D, E8663D PSG Signal Generators	http://cp.literature.agilent.com/litweb/pdf/E8251-90359.pdf	
E8663B Analog Signal Generator	http://cp.literature.agilent.com/litweb/pdf/E8663-90009.pdf	

 Table 10-1
 Service Guide Document Locations

Once the Processor and Hard Disk assemblies have been removed, proceed as in Table 10-2 below:

Table 10-2Assembly Disposal Procedures

Assembly	Procedure
Processor (CPU) Board	Either
	Discard the processor board and send the instrument to a repair facility. A new Processor Board will be installed, then the instrument will be repaired and calibrated. If the instrument is still under warranty, you will not be charged for the new Processor Board.
	or
	If you have another working instrument, install the Processor Board into that instrument and erase the memory. Then reinstall the Processor Board back into the non-working instrument and send it to a repair facility for repair and calibration. If you discover that the Processor Board does not function in the working instrument, discard the Processor Board and note that it caused the instrument failure on the repair order. If the instrument is still under warranty, you will not be charged for the new Processor Board.
A4 Memory Assembly	Either
(MXG Vector Instruments Only)	Discard the board and send the instrument to a repair facility. A new board will be installed, then the instrument will be repaired and calibrated. If the instrument is still under warranty, you will not be charged for the new board.
	or
	If you have another working instrument, install the board into that instrument and erase the memory. Then reinstall the board back into the non-working instrument and send it to a repair facility for repair and calibration. If you discover that the board does not function in the working instrument, discard the board and note that it caused the instrument failure on the repair order. If the instrument is still under warranty, you will not be charged for the new board.
Hard Disk	Either
(E4438C Option 005, E8267D Option 005, and E8267C Option 005 only)	Discard the Hard Disk and send the instrument to a repair facility. Indicate on the repair order that the Hard Disk was removed and must be replaced. A new Hard Disk will be installed, then the instrument will be repaired and calibrated. If the instrument is still under warranty, you will not be charged for the new hard disk.
	or
	Keep the Hard Disk and send the instrument to a repair facility. When the instrument is returned, reinstall the Hard Disk.

Table 10-2 Assembly Disposal Procedures	
Assembly	Procedure
Solid State (Flash) Drive (E8257N Option 008, E8257D/E8663D Option 008, and E8267D Option 009 only)	Remove the Solid State Drive from the instrument, then send the instrument to a repair facility. Indicate on the repair order that the Solid State Drive was removed and must be replaced. When the instrument is returned, reinstall the original Solid State Drive.

Procedure for Declassifying a Faulty Instrument



: 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

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

3. Greenliant NANDrive Security Erase Feature, Purge Command Specification

This Application Note may be obtained in PDF format from Greenliant Systems Ltd., by contacting the company via their web site:

http://www.greenliant.com/contact_us

4. AT Attachment 8 - ATA/ATAPI Command Set (ATA8-ACS)

INCITS Technical Committee T13/1699-D Revision 6a, September 6th, 2008 This standard may be downloaded in Acrobat (PDF) format from the INCITS T13 web site: http://www.t13.org/documents/UploadedDocuments/docs2008/D1699r6a-ATA8-ACS.pdf

5. **Installation Guide**

Agilent Technologies Inc. Specific to Signal Generator model

MXG (Series B) & EXG: http://cp.literature.agilent.com/litweb/pdf/N5180-90054.pdf

MXG (Series A): http://cp.literature.agilent.com/litweb/pdf/N5180-90002.pdf

PSG: http://cp.literature.agilent.com/litweb/pdf/E8251-90352.pdf

ESG: http://cp.literature.agilent.com/litweb/pdf/E4400-90502.pdf

6. **Programming Guide**

Agilent Technologies Inc. Specific to Signal Generator model: MXG (Series B), EXG & PSG: http://cp.literature.agilent.com/litweb/pdf/E8251-90355.pdf MXG (Series A) & ESG: http://cp.literature.agilent.com/litweb/pdf/N5180-90005.pdf

7. SCPI Programmers Reference

Agilent Technologies Inc. Specific to Signal Generator model: MXG (Series B) & EXG: http://cp.literature.agilent.com/litweb/pdf/N5180-90057.pdf MXG (Series A): http://cp.literature.agilent.com/litweb/pdf/N5180-90004.pdf PSG: http://cp.literature.agilent.com/litweb/pdf/E8251-90356.pdf ESG: http://cp.literature.agilent.com/litweb/pdf/E4400-90506.pdf

This information is subject to change without notice.

© Agilent Technologies, Inc. 2004-2014 Published in USA, February 2014 Supersedes: August 2012 E4400-90621



Agilent Technologies