Keysight Technologies FieldFox Handheld Analyzer

N9912A, N9913A, N9914A, N9915A, N9916A, N9917A, N9918A, N9923A, N9923AN, N9925A, N9926A, N9927A, N9928A, N9935A, N9936A, N9937A, N9938A

Security Features and Volatility Documentation

KEYSIGHT TECHNOLOGIES

Notices

Trademark Acknowledgments

Manual Part Number

N9912-90008

Edition

Edition 1, June 1, 2015

Supersedes: April 24, 2014

Printed in USA/Malaysia

Published by:
Keysight Technologies
1400 Fountaingrove Parkway
Santa Rosa, CA 95403

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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.

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1 Contact Keysight Sales and Service Offices

Assistance with test and measurements needs and information on finding a local Keysight office is available on the internet at, http://www.keysight.com/find/assist. If you do not have access to the internet, please contact your field engineer.

NOTE

In any correspondence or telephone conversation, refer to the product 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 Product Declassification and Security

Model Number: N9912A, N9913A, N9914A, N9915A, N9116A, N9917A, N9918A, N9923A, N9923AN, N9925A, N9926A, N9927A, N9928A, N9935A, N9936A, N9937A, N9938A.

Product Name: FieldFox Handheld Analyzer

Introduction

This document describes instrument security features and the steps to declassify an instrument through memory sanitization or removal. For additional information please go to http://www.keysight.com/find/ad and click on the security instrument tab.

- Service Guide N9912A – (N9912-90003)
  (http://cp.literature.keysight.com/litweb/pdf/N9912-90003.pdf)
- Service Guide N9923A, N9923AN – (N9923-90018)
  (http://cp.literature.keysight.com/litweb/pdf/N9923-90018.pdf)
- Service Guide N9913A, N9914A, N9915A, N9916A, N9917A, N9918A, N9925A, N9926A, N9927A, N9928A, N9935A, N9936A, N9937A, N9938A – (N9927-90003)
  (http://cp.literature.keysight.com/litweb/pdf/N9927-90003.pdf)
- User's Guide N9912A – (N9912-90001)
  (http://cp.literature.keysight.com/litweb/pdf/N9912-90001.pdf)
- User's Guide N9923A – (N9923-90001)
  (http://cp.literature.keysight.com/litweb/pdf/N9923-90001.pdf)
- User's Guide N9913A, N9914A, N9915A, N9916A, N9917A, N9918A, N9925A, N9926A, N9927A, N9928A, N9935A, N9936A, N9937A, N9938A – (N9927-90001)
  (http://cp.literature.keysight.com/litweb/pdf/N9927-90001.pdf)

3 Terms and Definitions

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. (The instrument is declassified) 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).

4 System Components

Product/System includes the following components:

Model number	Name	Description	Reference/Remarks
N9912A	FieldFox Handheld Analyzer	Handheld Cable and Antenna Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9913A	FieldFox Handheld Analyzer	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9914A	FieldFox Handheld Analyzer	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9915A	FieldFox Handheld Analyzer	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9916A	FieldFox Handheld Analyzer	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9917A	FieldFox Handheld Analyzer	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9918A	FieldFox Handheld Analyzer	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9923A	FieldFox Handheld Analyzer	Vector Network Analyzer and Cable Tester	Volatile and Non volatile memory on SOM board, system board and RF board
N9925A	FieldFox Handheld Analyzer	Vector Network Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9926A	FieldFox Handheld Analyzer	Vector Network Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9927A	FieldFox Handheld Analyzer	Vector Network Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9928A	FieldFox Handheld Analyzer	Vector Network Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9935A	FieldFox Handheld Analyzer	Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board

Model number	Name	Description	Reference/Remarks
N9936A	FieldFox Handheld Analyzer	Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9937A	FieldFox Handheld Analyzer	Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board
N9938A	FieldFox Handheld Analyzer	Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board

5 Instrument Memory and Volatility Information

Table 5-1 Summary of instrument memory - base instrument

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
Flash memory (main memory), 64 MB	Yes	Yes	Yes	Factory default setting and, User saved data	Volatile and Non volatile memory on SOM board, system board and RF board	SOM board. Divided into three partitions: Keysight (42 Mb), FactoryData (2 Mb) and UserData (20 Mb). Only the UserData partition is accessible by the user.	Keysight and Factory Data are not user accessible. User Data: Memory erase procedure
Flash memory (microSD), 4 GB	Yes	Yes	Yes	Vector Network Analyzer and Spectrum Analyzer	Volatile and Non volatile memory on SOM board, system board and RF board	System board 4GB microSD is only used in FieldFox model N9913A, N9914A, N9915A, N9916A, N9917A, N9918A, N9925A, N9926A, N9927A, N9928A, N9935A, N9936A, N9937A, N9938A UserData on internal flash (64 MB flash memory) is not available when microSD flash memory is used	User Data: Memory erase procedure
RAM, volatile memory, 128 MB	Yes	Yes	No	Vector Network Analyzer and Spectrum Analyzer	Firmware operating memory	SOM board	External power and main battery both removed

Table 5-1 Summary of instrument memory - base instrument

Memory Type and Size	Is Memory user accessible as a mass storage device?	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
Flash memory, 32 Kb and volatile memory 1 Kb	No	No	Yes	System monitor micro-controller.	Factory default setting	System board	Not writable by the user
Flash memory, 128 bytes	No	No	Yes	PCA identification and revision information.	Factory default setting	System board and RF board Each PCA has an ID EPROM that stores PCA identification and revision information	Not writable by the user
Flash memory, 16 Kb, and volatile memory, 2 Kb	No	No	Yes	Front panel interface board micro-controller.	Factory default setting	Front panel interface board.	Not writable by the user
Flash memory, 1Kb	No	No	Yes	Vector Network Analyzer and Spectrum Analyzer	Factory default setting	Main battery	Not writable by the user

6 Memory Clearing, Sanitization and/or Removal Procedures

This section explains how to clear, sanitize, and remove memory from you 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.

Table 6-1 64 MB Flash Memory

Description and purpose	It is divided into three partitions: Keysight (42 Mb), FactoryData (2 Mb) and UserData (20 Mb). Only the UserData partition is accessible by the user.
Size	64 MB
Memory clearing	Memory Erase function
Memory sanitization	The following process completely clears all user accessible memory on the FieldFox instrument. This process requires firmware revision A.03.02 or later. – Press the following keys: 1. System(7) 2. Service Diagnostics 3. Advanced 4. Erase User Data 5. Confirm Erase 6. Wait for the instrument to reboot and begin normal operation. The process will completely erase the UserData flash memory partition and reboot the instrument. When the reboot is completed, the instrument will be ready for normal operation. – Remove the main battery and external power from the FieldFox instrument for at least two minutes. This will erase the volatile RAM on the SOM board.
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	See Remarks

Table 6-1 64 MB Flash Memory

Description and purpose	It is divided into three partitions: Keysight (42 Mb), FactoryData (2 Mb) and UserData (20 Mb). Only the UserData partition is accessible by the user.
Remarks	Notes on the process for erasing the UserData flash memory partition There are two basic types of files in the UserData partition. One type is "system" files that are required for normal operation of the firmware. When the firmware finds one or more of these "system" files missing at boot up, default versions of these "system" files are written into the partition. Some of these "system" files may be modified by the user. The second type of files result from actions by the user (saving traces, saving screen captures, saving state files, etc.). When the UserData partition is cleared, all files are removed from the partition. When the instrument re-boots, the firmware writes default versions of "system" files that are missing. Thus, clearing the UserData partition does not permanently interfere with normal operation of the instrument. There is no "full chip erase" function available on the memory chips used for the flash memory on the SOM board. The lowest level erase available on the flash memory is the sector erase. A sector erase sets all bytes within a given sector to FF (all one's). The Erase User Data function does the following: – Performs a sector erase on all sectors in the UserData partition. – Writes zeros into all bytes in the UserData partition. – Performs a sector erase on all sectors in the UserData partition. – The instrument is re-booted

Table 6-2 4 GB Internal microSD Card

Description and purpose	Stores Operating System, Application Firmware and some User Data. Only the User Data is accessible by the user
Size	4 GB
Memory clearing	The following process completely clears all user accessible data on the FieldFox instrument. This process requires firmware revision A.03.02 or later. Press the following keys: 1. System(7) 2. Service Diagnostics 3. Advanced 4. Erase User Data 5. Confirm Erase Wait for the instrument to reboot and begin normal operation. The process will completely erase the UserData on the 4GB Internal microSD Card and reboot the instrument. When the reboot is completed, the instrument will be ready for normal operation.
Memory sanitization	The following process completely clears all user accessible memory on the FieldFox instrument. This process requires firmware revision A.03.02 or later. Press the following keys: 1. System(7) 2. Service Diagnostics 3. Advanced 4. Erase User Data 5. Confirm Erase Wait for the instrument to reboot and begin normal operation. The process will completely erase the Data on the 4GB Internal microSD Card and reboot the instrument. When the reboot is completed, the instrument will be ready for normal operation.
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	N/A
Remarks	4GB microSD is only used in FieldFox model N9913A, N9914A, N9915A, N9916A, N9917A, N9918A, N9925A, N9926A, N9927A, N9928A, N9935A, N9936A, N9937A, N9938A UserData on internal flash (64 MB flash memory) is not available when microSD flash memory is used.

Table 6-3 128 MB RAM

Description and purpose	Firmware operating memory
Size	128 GB
Memory clearing	External power and main battery removed
Memory sanitization	External power and main battery removed
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	N/A
Remarks	

Table 6-4 System Board Micro-Controller, 32 Kb Flash Memory, 1 Kb Volatile Memory

Description and purpose	For System Board System Monitor Micor-Controller
Size	32 Kb Flash Memory, 1 Kb Volatile Memory
Memory clearing	Not writable by the user
Memory sanitization	N/A
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	N/A
Remarks	

Table 6-5 EPROM 128 Bytes

Description and purpose	PCA identification and revision information
Size	128 bytes
Memory clearing	Not writable by the user
Memory sanitization	N/A
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	N/A
Remarks	

Table 6-6 Front Panel Interface Board Micro-Controller, 16 Kb Flash Memory, 2 Kb Volatile Memory

Description and purpose	Front panel interface board micro-controller
Size	16 Kb Flash Memory, 2 Kb Volatile Memory
Memory clearing	Not writable by the user
Memory sanitization	N/A
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	N/A
Remarks	

Table 6-7 Flash Memory on Main Battery, 1 Kb

Description and purpose	Smart battery, to maintain information about battery usage and current condition
Size	1 Kb
Memory clearing	Not writable by the user
Memory sanitization	N/A
Memory removal	This memory can not be removed without damaging the instrument
Write protecting	N/A
Memory validation	N/A
Remarks	

7 User and Remote Interface Security Measures

Screen and Annotation Blanking

For security reasons, frequency information can be prevented from appearing on the FieldFox by following below procedure. The same information is available in the User's Guide.

Table 7-1 How to set Security Level

Step
1. Press **System 7**
2. Then **System Configuration**
3. Then **Security Level**
4. Then choose from the following:
– **None** All frequency settings are visible.
– **High** Frequency information is blanked from the following:
– Display annotation
– Softkeys
– Marker display and marker table
– Calibration properties
– All settings tables
– Limit line tables
– All saved .png files
Any of the following will re-display frequency information:
– Set to **None**, Preset, Mode Preset, or FieldFox restart.

USB/SD Card Removable Mass Storage Device Security

There is no capability to control removable USB/SD card mass storage permissions from the FieldFox user interface at this time. The customer is responsible for managing removable storage media in secure locations.

Remote Access Interfaces

The user is responsible for providing security for the LAN port for remote access by controlling physical access to the LAN port. The LAN port must be controlled because they provide access to all user settings, user states and the display image.

The LAN port provides the following services:

- ftp
- sockets

8 Procedure for Declassifying a Faulty Instrument

If the instrument is not functioning and you are unable to use the security functions to clear the User Data, you must physically remove the SOM board and discard and destroy it. And, send the instrument to a repair facility. If the repair facility determines that a new SOM board fixes the problem and the instrument is still under warranty, you will not be charged for the new board. If they determine that the failure was caused by something other than the SOM board, you will be charged for the new board even though the instrument is still under warranty.

The 4GB microSD resides in System Board. If the instrument is not functioning and you are unable to use the security functions to clear the User Data, you must physically remove the microSD from the System Board and keep it within secure environment. And send the instrument to a repair facility. If the repair facility determines that a new System Board fixes the problem and the instrument is still under warranty, you will not be charged for the new board. If they determine that the failure was caused by something other than the System Board, you will be charged for the new board even though the instrument is still under warranty.

The customer is responsible for removing and replacing the storage media assemblies at their secure location. Refer to the service guide for assembly replacement procedures.

Edition 1, June 2015

N9912-90008
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