

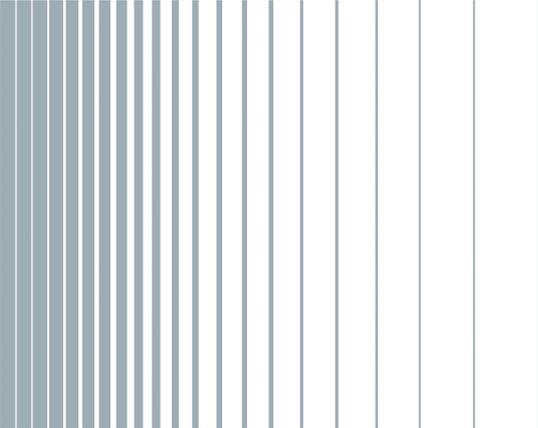
R&S® Scope Rider RTH

Handheld Digital Oscilloscope

Instrument Security Procedures



1178.3757.02 – 02



1 Overview

In many cases, it is imperative that the R&S RTH Handheld Oscilloscopes are used in a secured environment. Generally these highly secured environments do not allow any test equipment to leave the area unless it can be proven that no user information leaves with the test equipment. Security concerns can arise when devices need to leave a secured area e.g. to be calibrated or serviced.

This document describes the types of memory and their usage in the R&S RTH. 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 procedures. These sanitization procedures are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS).

2 Instrument Models Covered

This document applies to the following R&S RTH models:

Product name	Order number
R&S RTH1002	1317.5000K02
R&S RTH1004	1317.5000K04

3 Security Terms and Definitions

Clearing

The term "clearing" is 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 so that the data can no longer be retrieved using the standard interfaces on the instrument. Therefore, clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.

Sanitization

The term "sanitization" is 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 for service of calibration.

The memory sanitization procedures described in this document 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 14.1.16 of the ISFO "Manual for the Certification and Accreditation of Classified Systems under the NISPOM".

Instrument declassification

The term "instrument declassification" refers to procedures that must be undertaken before an instrument can be removed from a secure environment, for example when the instrument is returned for calibration. Declassification procedures include memory sanitization or memory removal, or both. The declassification procedures described in this document are designed to meet the requirements specified in DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", Chapter 8.

4 Types of Memory and Information Storage in the R&S RTH

The following table provides an overview of the memory components that are part of the Handheld Oscilloscope. For a detailed description regarding type, size, usage and location, refer to the subsequent sections.

Memory type	Size	Content	Volatility	User Data	Sanitization procedure
Frontboard					
EEPROM	1 kbyte	Hardware information (board serial number)	Non-volatile	No	None required
SRAM	4 kbit (micro-controller)	Temporary information storage for front controller firmware	Volatile	No	None required
Flash	32 kbit + 4 kbit (microcontroller)	Front controller firmware	Non-volatile	No	None required
Mainboard					
QSPI	2 x 512 MB	Instrument firmware and FPGA data	Non-volatile	No	None required
EEPROM	1 Mbit	Alignment data	Non-volatile	No	None required
	3 x or 4 x 512 bytes (microcontroller)	Used by firmware to control analog channels			
LPDDR2	512 Mbyte	Temporary information storage for operating system and instrument firmware	Volatile	Yes	Turn off instrument power
Flash	3 x or 4 x 16 kbyte (micro-controller)	Analog channel controller firmware	Non-volatile	No	None required
	512 kbyte	Interface controller firmware			

Memory type	Size	Content	Volatility	User Data	Sanitization procedure
SRAM	3 x or 4 x 1 kbit (micro-controller)	Temporary information storage for analog channel controller firmware	Volatile	No	None required
	196 kbyte (interface controller)	Temporary information storage for interface controller firmware			
SD card					
Micro SD card (removable)	4 Gbyte	Instrument and user data <ul style="list-style-type: none"> • Instrument data: <ul style="list-style-type: none"> – User settings – Configuration files – Log files – Screenshots – Trace data – Logger data • User data • Backup firmware 	Non-volatile	Yes	Remove micro SD card from instrument

4.1 Volatile Memory

The volatile memory in the instrument does not have battery backup. It loses its contents as soon as power is removed from the instrument. The volatile memory is not a security concern.

Removing power from volatile 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.

SRAM (frontboard)

The microcontroller on the frontboard contains 4 kbit of SRAM. The SRAM memory is used by the front controller firmware. It does not hold user data nor can the user access the storage.

Sanitization procedure: None required (no user data)

SRAM (mainboard)

Each microcontroller of the main board has one 1 kbit SRAM memory which contains temporary information storage for the analog channel controller firmware.

In addition, the interface controller on the main board has one 196 kbyte SRAM memory which contains temporary information storage for the interface controller firmware.

The SRAM does not hold user data nor can the user access the SRAM storage.

Sanitization procedure: None required (no user data)

LPDDR2

This 512 Mbyte of DDR memory is a shared working memory for the operating system and the signal processing system. It contains temporary information storage for operating system and instrument firmware. The LPDDR2 loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

4.2 Non-Volatile Memory

The R&S RTH contains various non-volatile memories. Out of these, only the removable micro SD card contains user data. The micro SD card can be physically removed from the R&S RTH and left in the secure area.

All non-volatile memories of the R&S RTH are not a security concern.

EEPROM (frontboard)

The R&S RTH frontboard contains 1 kbyte of EEPROM. The EEPROM contains information related to the installed hardware, such as board serial number. The EEPROM does not hold user data nor can the user access the EEPROM storage.

Sanitization procedure: None required (no user data)

Flash (frontboard)

An integrated flash with a size of 32 kbit + 4 kbit in the microcontroller at the frontboard contains the front controller's firmware. The flash does not hold user data nor can the user access the flash storage.

Sanitization procedure: None required (no user data)

QSPI

Each QSPI memory on the mainboard has a size of 512 MB and contains instrument firmware and FPGA data. The QSPI does not hold user data nor can the user access the QSPI storage.

Sanitization procedure: None required (no user data)

EEPROM (mainboard)

An EEPROM storage on the mainboard has a size of 1 Mbit and contains alignment data.

In addition, each EEPROM storage in the microcontroller, located in every analog channel on the mainboard, has a size of 512 bytes. It is used by firmware to control analog channels.

The EEPROM does not hold user data nor can the user access the EEPROM storage.

Sanitization procedure: None required (no user data)

Flash (mainboard)

The microcontrollers in every analog channel on the mainboard have an internal flash memory of 16 kbyte each. They contain the analog channel controller firmware.

The interface controller has a 512 kbyte internal flash memory, which is used for the interface controller firmware.

The flash memory does not hold user data nor can the user access the flash storage.

Sanitization procedure: None required (no user data)

Micro SD card

The R&S RTH is delivered with a micro SD card, which is inserted and ready to use. The removable micro SD card has a memory size of 4 Gbyte and is used to store all instrument data such as user settings, configuration files, log files, screenshots, trace data and logger data. In addition, backup firmware is stored on the micro SD card to boot the instrument if a firmware update failed. The micro SD card holds user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument.

The micro SD card can be removed from the R&S RTH Handheld Oscilloscope, leaving the customer assured that no user data is stored within the R&S RTH Handheld Oscilloscope.

Sanitization procedure: Remove micro SD card from instrument



The R&S RTH Handheld Oscilloscope, equipped with the removable micro SD card, addresses the needs of customers working in secured areas.

5 Instrument Declassification

Before you can remove the Handheld Oscilloscope from a secured area (for example to perform service or calibration), all classified user data needs to be removed. You can declassify the Handheld Oscilloscope as follows:

1. Turn off the Handheld Oscilloscope. This will sanitize the volatile memory.
2. To remove the classified micro SD card (containing user data), perform the following steps:
 - a) Remove power supply, probes, test leads and all other cables.
 - b) Fold out the tilt stand on the back of the instrument.

- c) Unscrew the battery cover.

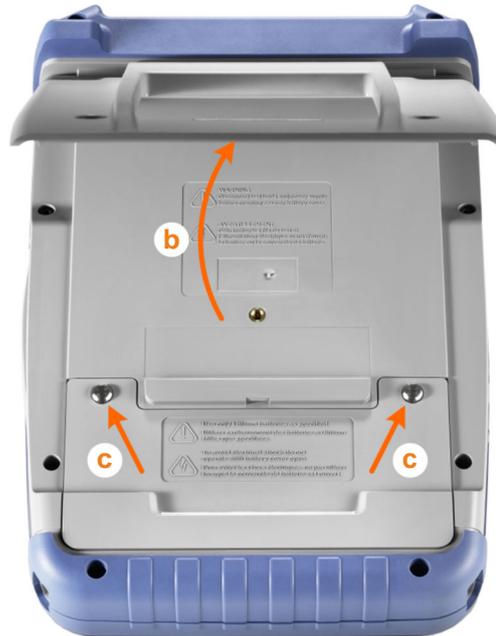


Figure 5-1: Opening of the battery cover

- d) Remove the battery pack.
The micro SD card slot is under the right lid under the battery pack.
e) Open the lid of the SD slot and hold it.
f) Remove the micro SD card.



Figure 5-2: Removing of the micro SD card

Following these steps removes all user data from the Handheld Oscilloscope. The Handheld Oscilloscope without the removable micro SD card can now leave the secured area.

These declassification procedures meet the needs of customers working in secured areas.

The Handheld Oscilloscope without the removable micro SD card still functions properly for service or other needs.

When the Handheld Oscilloscope is back within the secured area, the original classified removable micro SD card can be reinstalled.

Validity of instrument calibration after declassification

The calibration makes sure that measurements comply to government standards. Rohde & Schwarz recommends that you follow the calibration cycle suggested for your instrument.

The EEPROM is the only memory type used to hold permanent adjustment values required to maintain the validity of the R&S RTH's calibration. Therefore, the declassification does not affect the validity of the instrument's calibration.

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