

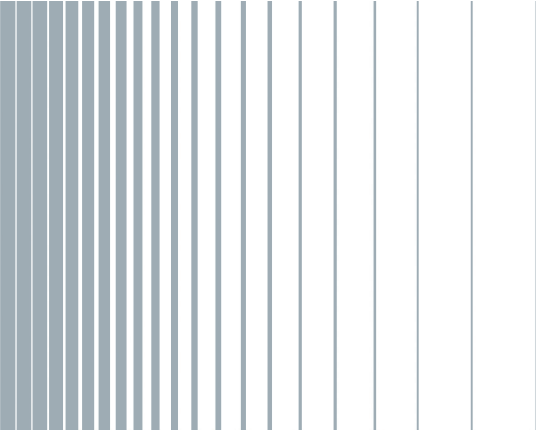
# R&S®RTM2000

## Digital Oscilloscope

### Instrument Security Procedures



1176.8239.02 – 03



# Contents

<b>1 Overview.....</b>	<b>2</b>
<b>2 Instrument Models Covered.....</b>	<b>2</b>
<b>3 Security Terms and Definitions.....</b>	<b>3</b>
<b>4 Types of Memory and Information Storage in the R&amp;S RTM.....</b>	<b>3</b>
<b>5 Secure Erase Procedures.....</b>	<b>6</b>
<b>6 Instrument Declassification.....</b>	<b>7</b>

## 1 Overview

In many cases, it is imperative that the R&S RTM Digital 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 RTM. 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

*Table 2-1: Digital Oscilloscope models*

Product name	Order number
R&S RTM2022	5710.0999.22
R&S RTM2024	5710.0999.24
R&S RTM2032	5710.0999.32
R&S RTM2034	5710.0999.34
R&S RTM2052	5710.0999.52
R&S RTM2054	5710.0999.54

Product name	Order number
R&S RTM2102	5710.0999.02
R&S RTM2104	5710.0999.04

## 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 RTM

The Digital Oscilloscope contains various memory components.

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

Memory type	Size	Content	Volatility	User Data	Sanitization procedure
SDRAM (main board)	3.25 Gbyte	<ul style="list-style-type: none"> <li>• Display (video) memory</li> <li>• Screen images</li> <li>• Measurement control data and intermediate measurement data</li> </ul>	Volatile	Yes	Turn off instrument power
SRAM (USB/LAN interface board)	512 kbyte plus 196 kbyte on micro-controller	USB/LAN data transfer buffer	Volatile	Yes	Turn off instrument power
Flash (USB/LAN interface board)	1 Mbyte	<ul style="list-style-type: none"> <li>• USB/LAN interface firmware</li> <li>• Board ID</li> <li>• Board serial number</li> </ul>	Non-volatile	No	None required (no user data)
Flash (front controller board)	24 kbyte	<ul style="list-style-type: none"> <li>• Front controller firmware</li> <li>• Board ID</li> <li>• Board serial number</li> </ul>			
FRAM (main board)	128 kbyte	<ul style="list-style-type: none"> <li>• Active instrument state and setup</li> <li>• Board and device IDs</li> <li>• Factory alignment data</li> </ul>	Non-volatile	Yes	Secure Erase procedure (see <a href="#">Chapter 5, "Secure Erase Procedures"</a> , on page 6 )
Flash (main board)	128 Mbyte	<ul style="list-style-type: none"> <li>• Instrument firmware</li> <li>• Instrument settings</li> <li>• Factory calibration data</li> <li>• Factory/current alignment data</li> <li>• User data</li> </ul>	Non-volatile	Yes	Secure Erase procedure (see <a href="#">Chapter 5, "Secure Erase Procedures"</a> , on page 6)
Flash (frontend)	512 kbyte	<ul style="list-style-type: none"> <li>• Factory calibration data</li> <li>• Factory/current alignment data</li> </ul>			

## 4.1 Volatile Memory

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

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 NIS-POM.

### SDRAM

The R&S RTM main board has 16 SDRAM memory devices with a total memory size of 3.25 Gbyte. The SDRAM contains the measurement and the display (video) data and is also used by the USB host controller. SDRAM loses its memory as soon as power is removed.

**Sanitization procedure:** Turn off instrument power

### SRAM

The R&S RTM USB/LAN interface board has one SRAM device with a size of 512 kbyte. In addition the microcontroller on this board has 196 kbyte of internal SRAM. The SRAM is used to buffer data transfers. SRAM loses its memory as soon as power is removed.

**Sanitization procedure:** Turn off instrument power

## 4.2 Non-Volatile Memory

The R&S RTM contains various non-volatile memories. Out of these, the FRAM and the flash memory devices on the frontend and main board contain user data. The user data can be removed from the Digital Oscilloscope with the Secure Erase procedure.

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

### Flash

The USB/LAN interface board of the R&S RTM has one microcontroller with an integrated 1 Mbyte flash memory.

The front controller board has also one microcontroller with an integrated 24 kbyte flash memory.

The flash memory contains the firmware, the board ID and the board serial number. It does not hold user data nor can the user access the storage.

**Sanitization procedure:** None required (no user data)

### FRAM

The main board of the R&S RTM has one 128 kbyte FRAM memory device. It contains the current instrument state and setup together with board and device IDs and factory alignment data. The FRAM can hold user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument.

The R&S RTM provides a sanitizing procedure that ensures that user data is irretrievably removed from the instrument.

**Sanitization procedure:** Secure Erase procedure (see [Chapter 5, "Secure Erase Procedures"](#), on page 6)

### Flash

The R&S RTM has one 128 Mbyte flash memory device on the main board. It contains the instrument firmware, the factory calibration/alignment data and the current alignment data. In addition, this flash memory stores all the instrument settings and user data.

The frontend of the R&S RTM has one flash memory device of 512 kbyte. It contains the factory calibration/alignment data and the current alignment data of the frontend.

The flash can hold user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument.

The R&S RTM provides a sanitizing procedure that ensures that user data is irretrievably removed from the instrument.

**Sanitization procedure:** Secure Erase procedure (see [Chapter 5, "Secure Erase Procedures"](#), on page 6)

## 5 Secure Erase Procedures

To sanitize the internal FRAM and flash memories, perform the following steps:

1. Press the SETUP key.
2. Press "Secure Erase" and confirm with "OK"  
All user data is removed and the factory default settings are restored.

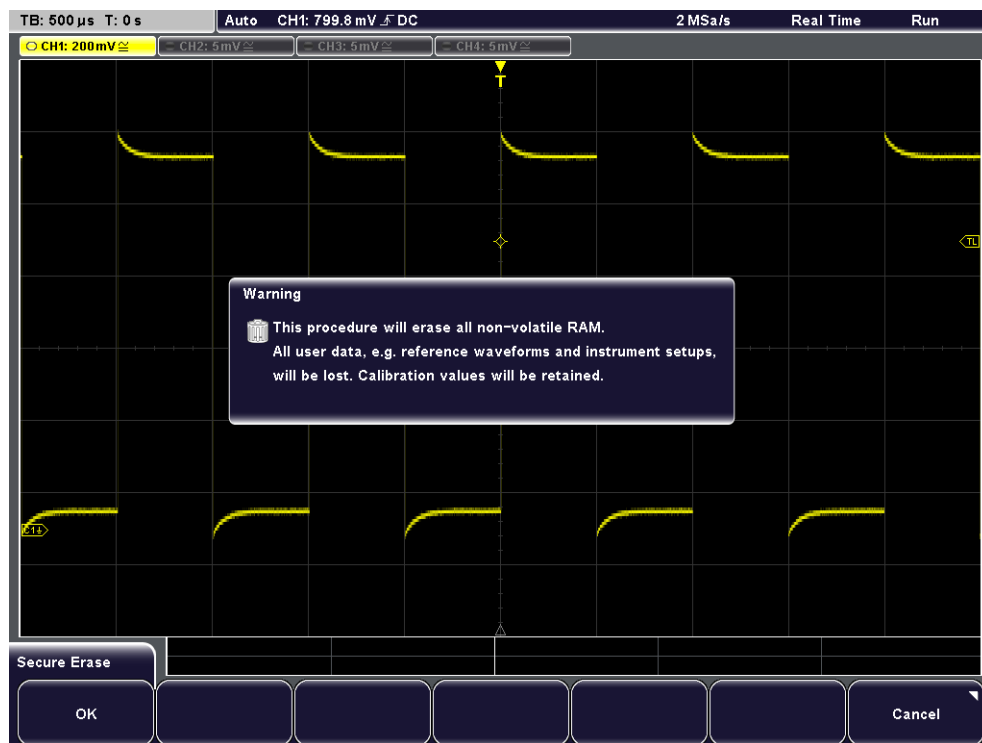


Figure 5-1: Secure Erase procedure

**Note:** Do not turn off the instrument during the Secure Erase process!

The Secure Erase procedure meets the memory sanitization requirements specified in the "Clearing and Sanitization Matrix" in Section 14.1.16 of the ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM.

## 6 Instrument Declassification

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

1. Sanitize the non-volatile memory as described in [Chapter 5, "Secure Erase Procedures"](#), on page 6.
2. Turn off the Digital Oscilloscope. This will sanitize the volatile memory.

Following these steps removes all user data from the Digital Oscilloscope. The Digital Oscilloscope can now leave the secured area.

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

### 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 permanent adjustment values required to maintain the validity of the R&S RTM's calibration are not affected by the Secure Erase procedure. Therefore, performing the declassification procedure, does not affect the validity of the instrument's calibration.

After the declassification procedure, perform a self-alignment once:



Note that the instrument has sufficient warm-up time before you perform the self-alignment.

---

1. Press the SETUP key.
2. Press "Self Alignment" and "Start".

Using the permanent and temporary values, the necessary adjustment information is then stored in the R&S RTM. Rohde & Schwarz recommends that you perform the self-alignment function once a week.

© 2017 Rohde & Schwarz GmbH & Co. KG  
Mühldorfstr. 15, 81671 München, Germany  
Phone: +49 89 41 29 - 0  
Fax: +49 89 41 29 12 164  
Email: [info@rohde-schwarz.com](mailto:info@rohde-schwarz.com)  
Internet: [www.rohde-schwarz.com](http://www.rohde-schwarz.com)

Subject to change – Data without tolerance limits is not binding.  
R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG.  
Trade names are trademarks of their owners.

Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol , e.g. R&S®RTM is indicated as R&S RTM.