

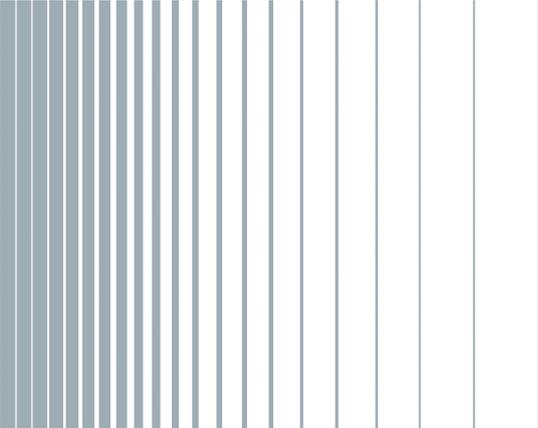
R&S®RTP

Oscilloscope

Instrument Security Procedures



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Contents

1 Overview.....	2
2 Instrument Models Covered.....	2
3 Security Terms and Definitions.....	3
4 Types of Memory and Information Storage in the R&S RTP.....	3
5 Instrument Declassification.....	7
6 Special Considerations for USB Ports.....	8

1 Overview

In many cases, it is imperative that the R&S RTP 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 RTP. 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: oscilloscope models

Product name	Order number
R&S RTP044	1320.5007.04
R&S RTP064	1320.5007.06
R&S RTP084	1320.5007.08

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 RTP

The 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/DDR3 (CPU board)	16 Gbyte	Temporary information storage for operating system and instrument firmware	Volatile	Yes	Turn off instrument power
SDRAM/DDR2/DDR3 (main board)	4x3584 Mbyte + 1024 Mbyte (FPGA)	<ul style="list-style-type: none"> Waveform data Measurement data 	Volatile	Yes	Turn off instrument power
SDRAM/DDR4 (trigger board)	4096 Mbyte	<ul style="list-style-type: none"> Waveform data 	Volatile	Yes	Turn off instrument power
EEPROM (board assembly)	32 kbyte up to 128 Mbyte	Hardware information: <ul style="list-style-type: none"> Serial number Product options Calibration correction data FPGA configuration 	Non-volatile	No	None required (no user data)
Flash (CPU board)	8 Mbyte	BIOS	Non-volatile	No	None required (no user data)
Solid-State Drive (SSD) (removable)	256 Gbyte	<ul style="list-style-type: none"> Operating system Instrument firmware Instrument states and setups Limit lines Waveform data Measurement results and screen images 	Non-volatile	Yes	Remove SSD from instrument
EEPROM (R&S RTP-B1 and -B6)	Option R&S RTP-B1: 256 Mbit Option R&S RTP-B6: 128 Mbit	<ul style="list-style-type: none"> Component information FPGA configuration 	Non-volatile	No	None required (no user data)
RAM/DDR2 (R&S RTP-B1)	4 Gbit	<ul style="list-style-type: none"> Waveform data 	Volatile	Yes	Turn off instrument power
SDRAM/DDR3 (R&S RTP-B6)	2 Gbit	<ul style="list-style-type: none"> Waveform data 	Volatile	Yes	Turn off instrument power

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/DDR3

The SDRAM/DDR3 on the CPU board has a size of 16 Gbyte and contains temporary information storage for operating system and instrument firmware. The SDRAM/DDR3 loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

SDRAM/DDR3

The SDRAM/DDR2/DDR3 on the main board has a size of 4x3584 Mbyte + 1024 Mbyte (FPGA) and contains waveform and measurement data. It loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

SDRAM/DDR4

The SDRAM/DDR4 on the trigger board has a size of 4096 Mbyte and contains waveform data. It loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

RAM/DDR2 (option R&S RTP-B1)

The MSO option R&S RTP-B1 has 4 Gbit DDR2 RAM. The DDR2 RAM contains waveform data. It loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

SDRAM/DDR3 (option R&S RTP-B6)

The waveform generator option R&S RTP-B6 has 2 Gbit DDR3 SDRAM. The DDR3 SDRAM contains waveform data. It loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

4.2 Non-Volatile Memory

The R&S RTP contains various non-volatile memories. Out of these, only the removable Solid-State Drive contains user data. The SSD can be physically removed from the R&S RTP and left in the secure area.

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

EEPROM

Each board assembly in the R&S RTP oscilloscope has one EEPROM device with a size of 32 kbyte up to 128 Mbyte. The EEPROM contains information related to the installed hardware, such as board serial number, product options, calibration correction data and FPGA configuration. The EEPROM does not hold user data nor can the user access the EEPROM storage.

Sanitization procedure: None required (no user data)

Flash

The CPU board of the R&S RTP oscilloscope has one 8 Mbyte flash memory device. It contains the BIOS. The flash memory does not hold user data nor can the user access the flash memory.

Sanitization procedure: None required (no user data)

Solid-State Drive (SSD)

The removable SSD is located on the rear of the R&S RTP.

The SSD is used to store:

- Operating system
- Instrument firmware and firmware options (measurement personalities) with option license keys
- Instrument states and setups
- Trace data
- Limit lines, transducer tables
- Screen images

The SSD holds user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument.

The removable SSD can be removed from the oscilloscope to make sure that no user data is stored within the oscilloscope. This can be done without opening the instrument.

The R&S RTP, equipped with the removable SSD, addresses the needs of customers working in highly sensitive areas.

Sanitization procedure: Remove SSD from instrument

EEPROM (options R&S RTP-B1 and R&S RTP-B6)

The MSO option R&S RTP-B1 has one 256 Mbit EEPROM. The waveform generator option R&S RTP-B6 has one 128 Mbit EEPROM. Both EEPROMs contain information related to the installed hardware, such as component information and FPGA configuration. The EEPROMs do not hold user data nor can the user access the EEPROM storage.

Sanitization procedure: None required (no user data)

5 Instrument Declassification

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

1. Turn off the oscilloscope and disconnect the power plug. This will sanitize the volatile memory.
2. To remove the SSD (containing user data), perform the following steps:
 - a) Locate the SSD.

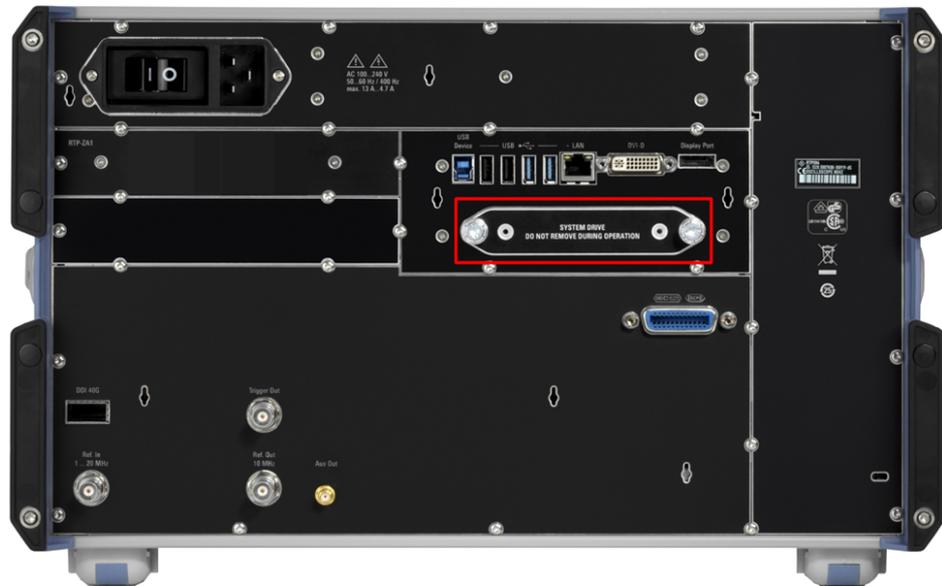


Figure 5-1: Location of the R&S RTP SSD

- b) Unscrew the two knurled screws.
- c) Remove the SSD at the rear of the instrument.

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

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

Once the R&S RTP is outside the secured area, installing a second non-classified removable SSD (without any user data) allows the oscilloscope to function properly for service or other needs.

Prior to re-entering the secured area, the non-classified removable SSD (without the user data) is removed. When the R&S RTP is back within the secured area, the original classified removable SSD can be reinstalled.

- To hold classified user data in secure areas, use the removable SSD comes with the instrument.

- To hold non-classified user data in non-secure areas, use a second SSD (R&S RTP-B19).

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 RTP's calibration. Therefore, replacing one removable SSD with another, does not affect the validity of the instrument's calibration.

After exchanging the removable SSD, perform a self-alignment once:



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

1. From the "File" menu, select "Self Alignment".
2. Tap "Start Alignment".

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

6 Special Considerations for USB Ports

USB ports can pose a security risk in high-security locations. Generally, this risk comes from small USB pen drives, also known as memory sticks or key drives. They can be easily concealed and can quickly read/write several Gbyte of data.

Disabling USB ports for writing user data

You can disable the write capability on the USB ports of the R&S RTP R&S RTP via a utility software. This utility software is available on the R&S RTP website <http://www.rohde-schwarz.com/product/rtp.html>.

To disable the write capability, copy the utility software to the R&S RTP and run it once. After a reboot of the instrument, the write capability on any USB memory device is disabled.

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