

R&S® Scope Rider RTH Handheld Digital Oscilloscope Instrument Security Procedures RTH手持示波器安全程序

 海洋儀器
致力于电子测试、维护领域!

 北京海洋兴业科技股份有限公司

北京市西三旗东黄平路 19 号龙旗广场 4 号楼(E座)906 室

电 话: 010-62176775 62178811 62176785

企业 QQ: 800057747

企业官网: www.hyxyyq.com

邮编: 100096

传真: 010-62176619

邮箱: info.oi@oitek.com.cn

购线网: www.gooxian.net



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1 Overview

In many cases, it is imperative that the R&S®RTH 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 handheld oscilloscope. 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:

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

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 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 Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM.

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. 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 | Non-volatile | No | None required |
| SRAM | 4 kbit | Used by controller firmware | Volatile | No | None required |
| Flash | 32 kbit + 4 kbit | Controller firmware | Non-volatile | No | None required |
| Mainboard | | | | | |
| QSPI | | Firmware | Non-volatile | No | None required |
| EEPROM | 1 Mbit | Alignment data | Non-volatile | No | None required |
| EEPROM for each analog channel | 512 bytes | Used by firmware | Non-volatile | No | None required |
| LPDDR2 | 512 Mbyte | Used by operating system and signal processing system | Volatile | Yes | Turn off instrument power |
| Flash for each analog channel | 16 kbyte | Controller firmware | Non-volatile | No | None required |
| Flash of interface controller | 512 kbyte | Used by interface controller firmware | Non-volatile | No | None required |
| Frontend | | | | | |
| SRAM | 1 kbit (micro-controller) 196 kbyte (interface controller) | Used by controller firmware | Volatile | No | None required |

| Memory type | Size | Content | Volatility | User Data | Sanitization procedure |
|------------------------|---------|--------------------------|--------------|-----------|-------------------------------------|
| SD card | | | | | |
| Removable microSD card | 4 Gbyte | Instrument and user data | Non-volatile | Yes | Remove microSD 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.

Sanitization procedure: None required (no user data)

SRAM (frontend)

The microcontroller on the frontend contains 1 kbit and the interface controller 196 kbytes of SRAM.

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 holds user settings and user data for processing.

Sanitization procedure: Turn off instrument power

4.2 Non-Volatile Memory

The removable microSD card is the only storage that contains user data. It can be physically removed from the instrument and left in the secure area. All other storages do not contain user data nor can the user access the storage.

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. It holds 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 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

The QSPI memory on the mainboard contains the complete firmware; this content is used to boot the device. 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 with a size of 1 Mbit on the mainboard contains the alignment data. The EEPROM does not hold user data nor can the user access the EEPROM storage.

The EEPROM storage in the microcontroller located in every analog channel on the mainboard has a size of 512 bytes. It is used by firmware only. 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 kbytes each. They contain the firmware for the controller. The Interface controller has a 512 kbytes internal flash memory, which is used by firmware only. It does not hold user data nor can the user access this storage.

Sanitization procedure: None required (no user data)

Removable microSD card

The R&S®RTH is delivered with a 4 Gbyte microSD card inserted and ready to use. The microSD card stores all instrument data such as user settings, configuration files, log files, screenshots and waveform data, logger data. Also any other user data can be stored on the microSD card. In addition, fallback firmware is stored on the microSD card to boot the instrument if an update failed.

Sanitization procedure: Remove microSD card from instrument

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 by removing the microSD card from the instrument. The microSD card slot is under the right lid under the battery pack.

1. Turn off the instrument power. Remove power supply, probes, test leads and all other cables.
2. Fold out the tilt stand on the back of the instrument.
3. Screw open the battery cover.
4. Remove the battery pack.



5. Open the lid of the SD slot and hold it.
6. Remove the microSD card.



All user data is now removed from the handheld oscilloscope. The instrument can now leave the secured area.

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企业官网：www.hxyyq.com

邮编：100096

传真：010-62176619

邮箱：info.oi@oitek.com.cn

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