

R&S®FSC

Spectrum Analyzer

Instrument Security Procedures



1173.1004.52 – 02

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## 1 Overview

In many cases, it is imperative that the R&S FSC Spectrum Analyzers 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 FSC. 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: Spectrum Analyzer models*

| Product name | Order number |
|--------------|--------------|
| R&S FSC3     | 1314.3006.03 |
|              | 1314.3006.13 |
| R&S FSC6     | 1314.3006.06 |
|              | 1314.3006.16 |

## 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 FSC

The Spectrum Analyzer 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                                |
|---------------------------------|----------------|--|--------------|-----------|---|
| Video - SRAM (main board)       | 512 kbyte      | <ul style="list-style-type: none"> <li>• Display memory (video memory)</li> <li>• Screen images</li> </ul>   | Volatile     | Yes       | Turn off instrument power                             |
| Measurement - SRAM (main board) | 512 k x 36 bit | Intermediate measurement data  | Volatile     | Yes       | Turn off instrument power                             |
|                                 | 256 kbyte      | Measurement control data   |              |           |   |
| EEPROM (front-end board)        | 32 kbyte       | Hardware information: <ul style="list-style-type: none"> <li>• Serial number</li> <li>• Product options</li> <li>• Calibration correction data</li> </ul>  | Non-volatile | No        | None required (no user data)                          |
| SDRAM (main board)              | 128 Mbyte      | <ul style="list-style-type: none"> <li>• Operating system</li> <li>• Instrument firmware</li> <li>• Active instrument and measurement setup</li> <li>• Active measurement data</li> </ul>  | Volatile     | Yes       | Turn off instrument power                             |
| Flash (main board)              | 64 Mbyte       | <ul style="list-style-type: none"> <li>• Operating system</li> <li>• Instrument firmware</li> <li>• Factory default settings</li> <li>• Limit lines, transducer data</li> <li>• User calibration data</li> <li>• Saved user data sets</li> </ul> | Non-volatile | Yes       | Master preset procedure (see <a href="#">step 1</a> ) |

## 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.

### Video - SRAM

The main board of the R&S FSC Spectrum Analyzer has one 512 kbyte SRAM memory device. The SRAM contains the video (display) memory. The Video-SRAM loses its memory as soon as power is removed.

**Sanitization procedure:** Turn off instrument power

### Measurement - SRAM

The main board of the R&S FSC Spectrum Analyzer has one 512k x 36-bit SSRAM memory device which contains intermediate measurement data.

A second 256 kbyte SRAM memory within the CPU (XScale) contains the measurement control data.

The SRAM loses its memory as soon as power is removed.

**Sanitization procedure:** Turn off instrument power

### SDRAM

The main board of the R&S FSC Spectrum Analyzer has one 128 Mbyte SRAM memory device, which contains the operating system, instrument firmware, factory default settings, the active instrument and measurement setup and the current measurement data. The SDRAM loses its memory as soon as power is removed.

**Sanitization procedure:** Turn off instrument power

## 4.2 Non-Volatile Memory

The R&S FSC contains various non-volatile memories. Out of these, the SRAM and flash contain user data. Both can be sanitized via master preset procedure.

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

### EEPROM

The front-end board of the R&S FSC Spectrum Analyzer has one EEPROM device with a size of 32 kbyte. The EEPROM contains information related to the installed hardware, such as board serial number, product options and calibration correction data. The EEPROM does not hold user data nor can the user access the EEPROM storage.

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

### Flash

The main board of the R&S FSC Spectrum Analyzer has one flash device. This device holds 64 Mbyte and can contain user data.

The flash contains the following information:

- Instrument firmware
- Factory default settings (display type and contrast, installed options, baud rate, language, length unit etc.)
- User general settings (display type and contrast, installed options, baud rate, language, length unit etc.)
- User data (cable models, transducers, limit lines, channel tables, user standards)
- User calibration data (DTF calibration data, tracking generator calibration data, etc.)
- Saved user data sets

The flash memory does not lose its memory when power is removed. Therefore, the memory device must be cleared before leaving the secured area.

**Sanitization procedure:** Master preset procedure (see [step 1](#))



The instrument firmware and factory default settings section of the flash memory will not be erased by the master preset procedure. The instrument firmware and factory default settings memory section does not hold any user data.

## 5 Instrument Declassification

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

1. For the sanitization of the non-volatile memory, perform the master preset procedure:

Remove user settings by restoring the factory defaults via SETUP and INSTRUMENT SETUP (F2 softkey). Then select RESET TO FACTORY SETTINGS (last item on list) and confirm with YES.

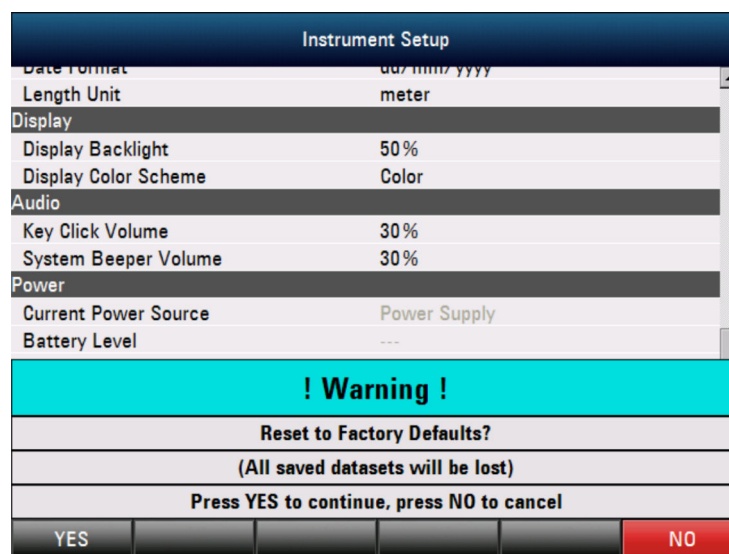


Figure 5-1: Memory clearing procedure

2. Turn off the instrument. This will sanitize the volatile memory.

Following these steps removes all user data from the Spectrum Analyzer. The Spectrum Analyzer 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 EEPROM is the only memory type used to hold permanent adjustment values required to maintain the validity of the R&S FSC's calibration. Therefore, performing the memory clearing procedures described above does not affect the validity of the instrument's calibration.

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