

R&S®ZVH

Cable and Antenna Analyzer

Instrument Security Procedures



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ROHDE & SCHWARZ

Instrument Security Procedures

Version 02

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1 Overview

It is often imperative that R&S ZVH Cable and Antenna 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 ZVH. 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: Cable and Antenna Analyzer models

| Product name | Order number |
|--------------|--------------|
| R&S ZVH4 | 1309.6800.24 |
| R&S ZVH8 | 1309.6800.28 |

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 ZVH

The Cable and Antenna 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"> Display memory (video memory) Screen images | Volatile | Yes | Turn off instrument power and remove the separate power supply unit |
| Measurement - SRAM (main board) | 2 Mbyte | Intermediate measurement data | Volatile | Yes | Turn off instrument power and remove the separate power supply unit |
| | 256 kbyte | Measurement control data | | | |
| EEPROM (front-end board) | 32 kbyte | Hardware information: <ul style="list-style-type: none"> Serial number Product options Calibration correction data | Non-volatile | No | None required (no user data) |
| SRAM (main board) | 1 Mbyte or 8 Mbyte | <ul style="list-style-type: none"> Active instrument and measurement setup Active measurement data | Non-volatile (battery backup) | Yes | "Sanitize internal memory" procedure (see Chapter 5, "Instrument Declassification" , on page 6) |
| Flash (main board) | 4 Mbyte or 8 Mbyte | <ul style="list-style-type: none"> Instrument firmware Factory default settings User general settings User data User calibration data Saved user data sets | Non-volatile | Yes | "Sanitize internal memory" procedure (see Chapter 5, "Instrument Declassification" , on page 6) |

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 ZVH Cable and Antenna Analyzer has one 512 kbyte SRAM memory device. The SRAM contains the video (display) memory. The (Video-)SRAM loses its memory as soon as the instrument is switched off and the separate power supply unit power is removed.

Sanitization procedure: Turn off instrument power and remove the separate power supply unit

Measurement - SRAM

The main board of the R&S ZVH Cable and Antenna Analyzer has one 2 Mbyte SRAM memory device which contains intermediate measurement data.

A second 256 kbyte SRAM memory device on the main board contains the measurement control data.

The SRAM loses its memory as soon as the instrument is switched off and the separate power supply unit power is removed.

Sanitization procedure: Turn off instrument power and remove the separate power supply unit

4.2 Non-Volatile Memory

The R&S ZVH 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 ZVH are not a security concern.

EEPROM

The front-end board of the R&S ZVH Cable and Antenna 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)

SRAM

The main board of the R&S ZVH Cable and Antenna Analyzer has one SRAM memory device which holds 1 Mbyte or 8 Mbyte (depending on the spectrum analyzer model). This SRAM device contains the active instrument and measurement setup and the current measurement data. The SRAM can contain user data and is backed-up by the battery of the Cable and Antenna Analyzer. Therefore, the SRAM does not lose its information when power is removed and must be cleared before leaving the secured area.

Sanitization procedure: Master preset procedure (see [Chapter 5, "Instrument Declassification"](#), on page 6)

Flash

The main board of the R&S ZVH Cable and Antenna Analyzer has one flash device. This device holds 4 Mbyte or 8 Mbyte (depending on the Cable and Antenna Analyzer model) 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 [Chapter 5, "Instrument Declassification"](#), on page 6)



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

5 Instrument Declassification



Instrument declassification requires firmware 1.70 or higher.

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

1. Turn off the R&S ZVH. This will sanitize the volatile memory.
2. To sanitize the internal Flash memory, perform the following steps:
 - a) Make sure, that no USB mass memory device is connected.
 - b) Press the front panel buttons [PRESET] and softkey [5] and hold them while switching on the instrument again.

After a few seconds, the sanitizing procedure starts.

Sanitizing is indicated by the message "Secure Formatting Flash, please wait!" on the instrument's screen. The sanitizing procedure takes approximately 8 minutes.

Afterwards, the instrument reboots. Since permanent adjustment values are not located in instrument settings and user data section of the flash, the validity of the R&S ZVH Cable and Antenna Analyzer's calibration is maintained throughout the sanitization.

Following these steps removes all user data from the R&S ZVH Cable and Antenna Analyzer. The instrument 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 ZVH's calibration. Therefore, performing the memory clearing procedures described above does not affect the validity of the instrument's calibration.

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