R&S®ZN-Z154
Calibration Unit
Instrument Security Procedures

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ROHDE&SCHWARZ

Contents

1 Overview

In many cases, it is imperative that the R&S ZN-Z154 Calibration Units 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 ZN-Z154. 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: Calibration Unit models

Product name	Order number
R&S ZN-Z154 - 6 port	1319.5120.02

The number of ports can be increased to 12, 18 or 24 by means of the following extension ports:

- R&S ZN-Z154-B22
- R&S ZN-Z154-B32
- R&S ZN-Z154-B42

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 ZN-Z154

The Calibration Unit 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
Microcontroller RAM	100 kbyte	Temporary information storage for CPU operation	Volatile	Yes	Turn off instrument power (disconnect USB)
Microcontroller Flash	512 kbyte	Instrument firmware	Non-volatile	No	None required (no user data)
EEPROM	4 Mbyte	Hardware information: • Serial number • Product options • Calibration correction data	Non-volatile	No	None required (no user data)
Flash	16 Mbyte	Factory characterization data	Non-volatile	No	None required (no user data)
Micro SD card (removable)	1 Gbyte	User characterization data	Non-volatile	Yes	Remove micro SD 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 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 NISPOM.

Microcontroller RAM

The R&S ZN-Z154 Calibration Unit has a microcontroller with 100 kbyte RAM to control the Calibration Unit functionality. The microcontroller firmware is downloaded to this RAM whenever the Calibration Unit is switched on. This RAM is volatile memory and it loses its memory as soon as power (USB connection) is removed.

Sanitization procedure: Turn off instrument power (disconnect USB)

4.2 Non-Volatile Memory

The R&S ZN-Z154 contains various non-volatile memories. Out of these, only the removable micro SD card contains user data. The micro SD card can be physically removed from the R&S ZN-Z154 and left in the secure area.

All non-volatile memories of the R&S ZN-Z154 are not a security concern.

Microcontroller Flash

The microcontroller firmware is stored in its internal Flash memory of 512 kbyte. The firmware controls the functionality of the R&S ZN-Z154 Calibration Unit. The microcontroller Flash memory does not hold user data nor can the user access the microcontroller Flash memory.

Sanitization procedure: None required (no user data)

EEPROM

The R&S ZN-Z154 Calibration Unit has one 4 Mbyte EEPROM memory device. 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

In addition, the Calibration Unit has one 16 Mbyte Flash memory device for the factory characterization data. The Flash memory device does not hold user data nor can the user access the storage.

Sanitization procedure: None required (no user data)

Micro SD card

On its rear panel, the R&S ZN-Z154 Calibration Unit is equipped with one slot to hold a micro SD card. The removable micro SD card, included in the delivery, has a memory size of 1 Gbyte and is used to store user characterization data. The micro SD card holds user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument.

The micro SD card can be removed from the R&S ZN-Z154 Calibration Unit, leaving the customer assured that no user data is stored within the R&S ZN-Z154 Calibration Unit.

Sanitization procedure: Remove micro SD card from instrument

The R&S ZN-Z154 Calibration Unit, equipped with the removable micro SD card, addresses the needs of customers working in secured areas.

5 Instrument Declassification

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

1. Turn off the Calibration Unit. This will sanitize the volatile memory.

2. To remove the classified micro SD card (containing user data), perform the following steps:

   a) Locate the micro SD slot at the rear of the instrument.

Figure 5-1: Location of the micro SD card

   b) Remove the micro SD card.

Following these steps removes all user data from the Calibration Unit. The Calibration Unit without the removable micro SD card can now leave the secured area.

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

The Calibration Unit without the removable micro SD card still functions properly for service or other needs.

When the Calibration Unit is back within the secured area, the original classified removable micro SD card can be reinstalled.

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 Flash is the only memory type used to hold permanent adjustment values required to maintain the validity of the R&S ZN-Z154's calibration. Therefore, removing the micro SD card does not affect the validity of the instrument’s calibration.

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