

R&S[®]ZNLE

Vector Network Analyzer

Instrument Security Procedures



1178653302



ROHDE & SCHWARZ

Instrument Security Procedures

Version 04

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 ZNLE.....	3
5 Instrument Declassification.....	6
6 Special Considerations for USB Ports.....	7

1 Overview

It is often imperative that R&S ZNLE Vector Network 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 ZNLE. 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: Vector Network Analyzer models

Vector Network Analyzer	
R&S ZNLE3 – 2 port	1323.0012.53
R&S ZNLE6 – 2 port	1323.0012.56

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 ZNLE

The Vector Network 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	Location	Size	Content	Volatility	User Data	Sanitization procedure
SDRAM	CPU board	4 GByte	Temporary information storage for operating system and instrument firmware	Volatile	Yes	Turn off instrument power
EEPROM	CPU board	1 kByte	<ul style="list-style-type: none"> Board information / configuration Serial number 	Non-volatile	No	None required (no user data)
	Front panel	2 kByte	Hardware information			
Flash	CPU board	8 MByte	BIOS	Non-volatile	No	None required (no user data)
	Mother-board	32 MByte	<ul style="list-style-type: none"> FPGA configuration Hardware information Correction data 			
	VNA board	512 kByte	<ul style="list-style-type: none"> FPGA configuration HW information Correction data 			
	Reference board	1 MByte	<ul style="list-style-type: none"> Hardware information Correction data 			
	GPIB board (R&S FPL1-B10)	4 MByte	FPGA configuration			
SSD	CPU board	≥ 32 GByte	<ul style="list-style-type: none"> Operating system Instrument firmware Instrument settings Limit lines User calculation data Trace data Measurement results and screen images 	Non-volatile	Yes	Remove CPU board 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 NIS-POM.

SDRAM

The R&S ZNLE is equipped with 4 GByte of SDRAM.

It contains temporary information storage for operating system and instrument firmware. 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 ZNLE contains various non-volatile memories. Out of these, only the SSD contains user data.

The SSD is located on the CPU board. The CPU board can be physically removed from the R&S ZNLE and left in the secure area.

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

EEPROM

On the CPU board of the R&S ZNLE there is one EEPROM, which has the size of 1 kByte and contains configuration data and board serial number.

On the front panel board there is one EEPROM with 2 kByte, which contains hardware information.

The EEPROM memory devices do not hold any user data nor can the user access the storage.

Sanitization procedure: None required (no user data)

Flash

There is one Flash memory of 8 MByte on the CPU board, which contains the BIOS.

On the VNA board of the R&S ZNLE there is one Flash memory with 512 kByte, which contains FPGA configuration, hardware information, and correction data.

On the reference board there is one Flash memory of 1 MByte, which contains hardware information and correction data.

On the GPIB board (option R&S FPL1-B10, if installed) there is one Flash memory with 4 MByte for the FPGA configuration.

The Flash memory devices do not hold any user data nor can the user access the storage.

Sanitization procedure: None required (no user data)

SSD

The R&S ZNLE Vector Network Analyzer is equipped with a SSD.

The SSD is used to store:

- Instrument operating system
- Instrument firmware
- Instrument settings
- Limit lines
- User calculation data
- Trace data
- Measurement results and screen images

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

The SSD is located on the CPU board. The CPU board can be physically removed from the Vector Network Analyzer to make sure that no user data is stored within the Vector Network Analyzer.



With its removable CPU board the R&S ZNLE Vector Network Analyzer addresses the needs of customers working in secured areas.

Sanitization procedure: Remove CPU board from instrument

5 Instrument Declassification

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

1. Turn off the Vector Network Analyzer and disconnect the power plug. This will sanitize the volatile memory.
2. To remove the classified SSD (containing user data), perform the following steps:
 - a) Locate the CPU board at the rear of the instrument.

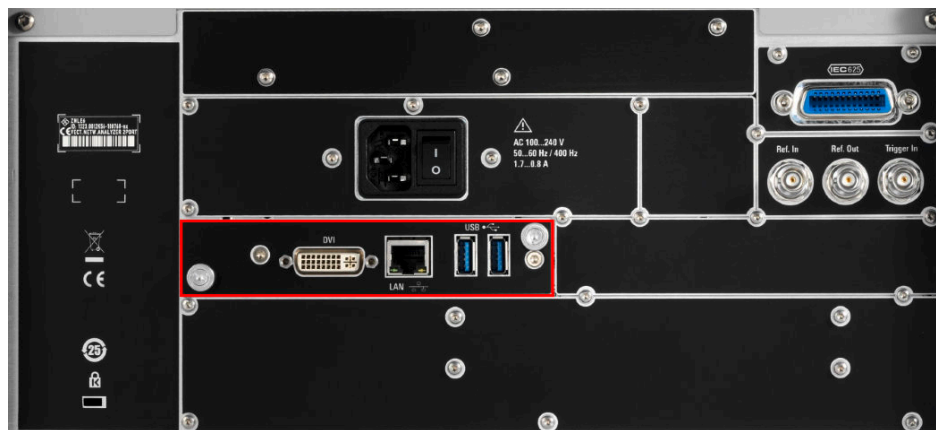


Figure 5-1: Location of the CPU board for R&S ZNLE

- b) Unscrew the two knurled screws.
- c) Remove the CPU board.

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

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

Once the Vector Network Analyzer is outside the secured area, installing a second removable CPU board (without any user data) allows the Vector Network Analyzer to function properly for service or other needs (option R&S ZNLE-B19).

Prior to re-entering the secured area, the non-classified removable CPU board (without the user data), is removed. When the Vector Network Analyzer is back within the secured area, the original classified removable CPU board can be reinstalled.

- To hold classified user data in secure areas, use the removable CPU board which comes with the instrument.
- To hold non-classified user data in non-secure areas, use a second removable CPU board (R&S ZNLE-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 Flash memory on the VNA board is the only memory type used to hold permanent adjustment values required to maintain the validity of the R&S ZNLE's calibration. Therefore, replacing one removable CPU board with another, does not affect the validity of the instrument's calibration.

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 ZNLE via a utility software. This utility software is available on the R&S ZNLE website <https://www.rohde-schwarz.com/product/znle.html>.

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

© 2019 Rohde & Schwarz GmbH & Co. KG

Mühldorfstr. 15, 81671 München, Germany

Phone: +49 89 41 29 - 0

Fax: +49 89 41 29 12 164

Email: info@rohde-schwarz.com

Internet: www.rohde-schwarz.com

Subject to change – Data without tolerance limits is not binding.

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG.

Trade names are trademarks of the owners.