R&S®NGC
Power Supply Series
Instrument Security Procedures

1179751002
Version 01

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This document describes the types of memory and their use in the power supply series.
While every effort has been made to ensure the accuracy of the information herein, it is provided without warranty. Design iteration and revisions may result in minor differences between the information provided here and your product.

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Throughout this document, products from Rohde & Schwarz are indicated without the ® symbol , e.g. R&S®NGC101 is indicated as R&S NGC101.

Contents

1 Overview

Securing important information is crucial in many applications.

Generally, 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, e.g. to be calibrated.

"Regarding sanitization, the principal concern is ensuring that data is not unintentionally released" [1].

This document provides a statement regarding the volatility of the memory types used and specifies the steps required to sanitize an instrument.

The procedures in this document follow "NIST Special Publication 800-88: Guidelines for Media Sanitization" [1].

In addition, recommendations are provided to safeguard information on the product.

References

See the following literature for further information.

[1] **Kissel Richard L. [et al.]** Guidelines for Media Sanitization = Special Publication (NIST SP) = NIST SP - 800-88 Rev 1. - Gaithersburg : [s.n.], December 17, 2014.

[2] **National Industrial Security Program Authorization Office** Defense Security Service (DSS) Assessment and Authorization Process Manual (DAAPM). - May 6, 2019.

[3] **ACSC Australian Cyber Security Centre** Australian Government Information Security Manual, January 2020.

2 Instrument models covered

Table 2-1: R&S NGC models

Product name	Order number
R&S®NGC101	3657.2288.02
R&S®NGC101-G	3657.2288.03
R&S®NGC102	3657.2359.02
R&S®NGC102-G	3657.2359.03
R&S®NGC103	3657.2413.02
R&S®NGC103-G	3657.2413.03

3 Security terms and definitions

Terms defined in Guidelines for Media Sanitization

According to NIST Special Publication 800-88 [1]: "Sanitization is a process to render access to target data (the data subject to the sanitization technique) on the media infeasible for a given level of recovery effort." It defines the following categories of sanitization:

- **"Sanitization"**
  "Media sanitization refers to a process that renders access to target data on the media infeasible for a given level of effort."
- **"Clear"**
  "Clear applies logical techniques to sanitize data in all user-addressable storage locations for protection against simple non-invasive data recovery techniques; typically applied through the standard Read and Write commands to the storage device, such as by rewriting with a new value or using a menu option to reset the device to the factory state (where rewriting is not supported)."
- **"Purge"**
  "Purge applies physical or logical techniques that render Target Data recovery infeasible using state of the art laboratory techniques."
- **"Destroy"**
  "Destroy renders Target Data recovery infeasible using state of the art laboratory techniques and results in the subsequent inability to use the media for storage of data."

Control of media

Another option to secure sensitive information is to keep physical media within the classified area, see [1], paragraph 4.4.

Volatile memory

"Memory components that do not retain data after removal of all electrical power sources, and when reinserted into a similarly configured system, are considered volatile memory components." [2]

Typical examples are RAM, e.g. SDRAM.

Non-volatile memory

"Components that retain data when all power sources are discontinued are non-volatile memory components." [2].

In the context of this document, non-volatile memory components are non-user accessible internal memory types, e.g. EEPROM, Flash, etc.

Media

Media are types of non-volatile memory components. In the context of this document, media are user-accessible and retain data when you turn off power.

Media types are Hard Disk Drives (HDD), Solid State Drives (SSD), Memory Cards, e.g. SD, microSD, CFast, etc., USB removable media, e.g. Pen Drives, Memory Sticks, Thumb Drives, etc. and similar technologies.

4 Statement of volatility

The R&S NGC contains various memory components. See the subsequent sections for a detailed description regarding type, size, usage and location.

Notes on memory sizes

Due to the continuous development of memory components, the listed values of memory sizes may not represent the current, but the minimal configuration.

This document uses the common notation kbyte, Mbyte and Gbyte for memory sizes, although the prefix multiplication factor is 1024.

4.1 Volatile memory

Volatile memory modules refer to non-accessible internal storage devices, as described in Security terms and definitions > Volatile memory.

Table 4-1: Types of volatile memory

Memory type	Location	Size	Content / Function	User modifiable
DDR2 SDRAM	Front controller board	128 Mbyte	Operating system	No
SRAM	Front controller board MPU	128 kbyte	Temporary information storage for: • Operating system • Instrument firmware • User data	No
SRAM	DS-Board MCU One per channel	8 kbyte	Channel operating data	No
SRAM	DS-Board MCU, I/O interface	1 kbyte	Interface operating data	No

4.2 Non-volatile memory

Non-volatile memory modules refer to non-accessible internal storage devices, as described in Security terms and definitions > Non-volatile memory.

Table 4-2: Types of non-volatile memory

Memory type	Location	Size	Content / Function	User modifiable
NAND Flash	Front controller board	2 Gbit	• Board identification data • Firmware • Board internal correction data • Instrument settings and setups • User data	Yes
Internal ROM	Front controller board	160 kbyte	Bootloader	No

Memory type	Location	Size	Content / Function	User modifiable
SPI Flash	Front controller board	4 Mbit	User data	Yes
FRAM	Front controller board	64 kbit	Instrument settings	Yes
Flash	Front controller board MCU	512 bit	On / Off state	No
Flash	DS-Board MCU One per channel	64 kbyte	Firmware for channel control	No
Flash	DS-Board MCU, I/O interface	• 512 kbyte • 12 kbyte	• Board internal correction data • Bootloader	No

5 Instrument sanitization procedure

5.1 Volatile Memory

You can clear the volatile memory by following the procedure below. The sanitization procedure complies with the definition of NIST [1], see "Terms defined in Guidelines for Media Sanitization" on page 7.

The volatile memory in the instrument does not have battery backup. It loses its contents when power is removed from the instrument.

To turn off and remove power

1. Turn off the R&S NGC power supply.
2. Disconnect the power plug.

   Leave the instrument powered off at least for 10 minutes to make sure that all volatile memory modules lose their contents, see [3].

5.2 Non-volatile memory

You can clear the non-volatile memory by following the procedure below. The sanitization procedure complies with the definition of NIST [1], see "Terms defined in Guidelines for Media Sanitization" on page 7.

Sanitization is performed by means of a factory reset.

To execute a factory reset

1. **NOTICE!** Risk of losing data. The factory reset clears all user data and resets the instrument.

   Back up all data you want to keep.
2. If connected, disconnect the external USB mass memory.
3. Keep the media memory devices under organizational control.
4. **NOTICE!** Risk of instrument damage when interrupting the factory reset procedure. Do not turn off or disconnect the R&S NGC from the mains while the factory reset procedure is running.
   Wait until the instrument confirms the completed factory reset procedure.

   To reset the instrument to factory default, press the [Menu] key on the front panel of the R&S NGC.

5. Select "Device" > "Reset" menu item.
6. Select "Yes" to proceed when prompted to reset all settings to factory defaults.
7. Wait for the "Device reset" message to appear at the top left corner of the screen.
   All user data will be removed and factory default settings restored.

6 Operability outside secured area

The sanitization does not affect the functionality of the R&S NGC power supply series. The instrument works properly after sanitization.

7 Validity of Instrument calibration

The validity of the R&S NGC power supply series's calibration is maintained throughout the sanitization.

8 Special security features

This section leads you to the information on how to use the security features to protect the R&S NGC from unauthorized access of classified information saved or displayed in the instrument.

8.1 Considerations for LAN interfaces

In a LAN, the interface can pose a security risk due to unauthorized data access during operation.

See Chapter 9, "Recommended security settings", on page 16.

8.2 Considerations for the user interface

To prevent unauthorized personnel from reading the display, you can disable the user interface and the front control panel using the remote commands.

See Chapter 9, "Recommended security settings", on page 16.

9 Recommended security settings

Basically, see the user manual for the security concept of the R&S NGC, including instructions on how to prevent unauthorized access.

The user manual is provided for download on the product page at www.rohde-schwarz.com/manual/ngc100.

The following sections describe measures that protect from unauthorized access during operation, and procedures that enable you to remove user data before issuing the instrument outside the secure environment.

9.1 LAN interfaces and services

To protect the instrument against unauthorized data access in a high-security location, use it at local workplaces and connect it only to secured networks (LAN).

See the user manual for details.

Glossary

C

CFast: Compact Fast - compact flash mass memory device.

D

DRAM: Dynamic Random Access Memory.

H

HDD: Hard disk drive.

M

microSD: Micro Solid-state Drive - memory card.

S

SD: Solid-state drive - memory card.

SSD: ATA Solid-state drives (including PATA, SATA, eSATA, mSATA,...).

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