R&S®NGP800
Power Supply
Instrument Security Procedures

ROHDE&SCHWARZ

Instrument Security Procedures

Version 01

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1 Overview

In many cases, it is imperative that the R&S NGP800 Power Supplies 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 NGP800 series. 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: Power Supply models

Product name	Order number
R&S NGP804	5601.4007.02
R&S NGP824	5601.4007.03
R&S NGP814	5601.4007.04
R&S NGP802	5601.4007.05
R&S NGP822	5601.4007.06

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

The R&S NGP800 Power Supplies contain 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.

Table 4-1: Memory types

Memory type	Size	Content	Volatility	User Data	Sanitization procedure
Main Processor Internal Caches and Memory	-	Startup and operating instructions, operating data and states	Volatile	Yes	Power Off
DDR3 SDRAM	2 x 2 Gb	Operating instructions, user and program data	Volatile	Yes	Power Off
eMMC NAND Flash	4 GB	Board and device IDs, instrument firmware, calibration data, instrument settings, state and user data	Non-volatile	Yes	Secure Erase
MCU Internal Flash	256 + 3 KB per chip R&S NGP804 x 4 R&S NGP824 x 4 R&S NGP814 x 4 R&S NGP802 x 2 R&S NGP822 x 2	Channel control firmware and calibration data	Non-volatile	No	Not required
MCU Internal SRAM	32 KB per chip R&S NGP804 x 4 R&S NGP824 x 4 R&S NGP814 x 4 R&S NGP802 x 2 R&S NGP822 x 2	Channel operating data	Volatile	No	Power Off

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 NISPOM.

Main Processor Internal Caches and Memory

The R&S NGP800 series have internal caches and memory in its main processor on the front controller board. These contain startup and operating instructions, operating data and states that are critical to device performance and operation. Turning off instrument power will remove user data in the main processor.

Sanitization procedure: Turn off instrument power

SDRAM

The R&S NGP800 series has two DDR3 SDRAM memory devices with 2 Gbit each. They contain instructions and data for the operating system and device applications, including measurement and display data, when the power supply is running.

SDRAM loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

SRAM

The R&S NGP800 series has up to four 32 KByte SRAM devices which are integrated in the power supply's channel microcontrollers. The SRAMs contain the control and status/operating data of the channel control firmware and loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

4.2 Non-Volatile Memory

The R&S NGP800 series contain various non-volatile memories. User data can be removed from these memories with the Secure Erase procedure.

eMMC Flash

The R&S NGP800 series has one 4 GByte flash memory on the front controller board that contains board and device IDs, the instrument firmware and the factory calibration data. In addition, this flash memory stores all the instrument settings, the instrument state, and user data. The flash can hold user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument. The R&S NGP800 series provides a sanitizing procedure that ensures that user data is irretrievably removed from the instrument.

Sanitization procedure: Secure Erase procedure

Channel MCU Flash

The R&S NGP800 series has up to four microcontrollers each with an integrated 256 KByte flash memory with 3 KByte Boot Flash. The flash memory contains the channel control firmware as well as calibration data. It does not hold user data nor can the user access the storage.

Sanitization procedure: None required (no user data)

5 Secure Erase Procedure

To sanitize the internal flash memory, perform the following steps:

1. Press the menu button to the left of the R&S NGP800 series' LCD Panel.
2. Under the "Device" tab, scroll down to select "Save/Recall Device Settings".
3. Select "Factory Reset". Tap "Yes" to proceed when prompted to reset all settings to factory defaults.
4. Tap "Yes" to proceed when prompted to delete all files in "/int".
5. Wait for device to reboot and all user data will be removed and factory default settings restored.

Do **not** turn off the instrument during the Secure Erase process!

The Secure Erase procedure meets the memory sanitization requirements specified in the "Clearing and Sanitization Matrix" in Section 14.1.16 of the ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM.

6 Instrument Declassification

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

1. Sanitize the non-volatile memory as described in Chapter 5, "Secure Erase Procedure", on page 5.
2. Turn off the Power Supply. This will sanitize the volatile memory.

Following these steps removes all user data from the Power Supply. The Power Supply 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 permanent adjustment values required to maintain the validity of the R&S NGP800 series' calibration are not affected by the Secure Erase procedure. Therefore, performing the declassification procedure does not affect the validity of the instrument’s calibration.

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