touch, test, invent Series Instruments

Declassification and Security Instructions

Introduction

If you have data security concerns, this document tells you how to clear or sanitize instrument memory devices in the Keithley touch, test, invent® (TTI) series of instruments. It also explains how to declassify an instrument that is not functioning.

The procedures in this document are written to meet the requirements specified in:

- NISPOM, DoD 5220.22-M, chapter 8
- ISFO Process Manual for Certification and Accreditation of Classified Systems under NISPOM

Products

This document contains procedures for the following Keithley Instruments models:

- 2450, 2450-NFP, 2450-NFP-RACK, and 2450-RACK
- 2460, 2460-NFP, 2460-NFP-RACK, and 2460-RACK
- 2461, 2461-NFP, 2461-NFP-RACK, and 2461-RACK
- 2461-SYS
- 2470 and 2470-RACK
- DMM7510, DMM7510-NFP, DMM7510-NFP-RACK, and DMM7510-RACK

Contact information

If you have any questions after you review the information in this documentation, please contact your local Keithley Instruments office, sales partner, or distributor. You can also call the corporate headquarters of Keithley Instruments (toll-free inside the U.S. and Canada only) at 1-800-935-5595, or from outside the U.S. at +1-440-248-0400. For worldwide contact numbers, visit the Keithley Instruments website (tek.com/keithley).

Terminology

The following terms may be used in this document:

- **Clear:** Removes data on media or in memory before reusing it in a secured area. Clears all reusable memory to deny access to previously unsecured information.
- **Demo setups:** Demonstration applications that come loaded on the instrument; you cannot modify them.
- **Direct method of modification:** You can modify data directly.
- **Erase:** Equivalent to clear (see above).
- **Indirect method of modification:** The instrument system resources modify the data; you cannot modify it.
- **Instrument declassification:** Procedures that must be completed before an instrument can be removed from a secure environment. Declassification procedures include memory sanitization and memory removal.
- **Media storage and data export device:** Devices that can be used to store or export data from the instrument, such as a USB port.
- **Nonvolatile memory:** Data is retained when the instrument power is turned off.
- **Protected user data area:** Contains data that is protected by a password.
- **Remove:** Clears instrument data by physically removing the memory device from the instrument.
- **Sanitize:** Eradicates instrument data from media and memory so it cannot be recovered by other means or technology. This is typically used when the device will be moved (temporarily or permanently) from a secured area to a nonsecured area.
- **Scrub:** Directly retrieve and clear the contents of the memory device.
- **User accessible:** You can directly retrieve the contents of the memory device.
- **User data:** Measurement data that represents signals that you connect to the instrument.
- **User modifiable:** You can write to the memory device during normal instrument operation using the front-panel interface or remote control.
- **User settings:** Instrument settings that you can change.
- **Volatile memory:** Temporary memory; data is lost when the instrument is turned off.

Description of memory

All of these instruments share common volatile and nonvolatile memory components. This document and these instructions work for all instruments listed in the section.

All of these instruments contain three sets of volatile and nonvolatile memory as described below.

The MASTER (U13 on the 2450-140 board) contains instrument logic, calibration data, and customer scripts, readings, and data:

- Two 16 MB nonvolatile NOR FLASH chips on the Digital board
- Two 128 MB volatile DDR2 SDRAM chips on the Digital board

The BLASTER (U1 on the 2450-140 board) contains instrument logic, calibration data, and customer scripts, readings, and data:

- Two 16 MB nonvolatile NOR FLASH chips on the Digital board
- One 128 MB volatile DDR2 SDRAM chip on the Digital board

The DISPLAY (U1 on 2450-110 board) contains instrument logic and customer setups and data:

- Two 16 MB nonvolatile NOR FLASH chips on the Digital board
- One 128 MB Volatile DDR2 SDRAM chip on the Digital board

NOTE

Each instrument contains a battery-backed up clock that is used to generate timestamps. It does not store data.

NOTE

Older Model 2450s (Digital/Display board revision C) have two volatile DDR2 SDRAM chips for the BLASTER and DISPLAY. However, the process for clearing and sanitizing data is identical.

Memory devices

The following tables list the volatile and nonvolatile memory devices in the standard instrument and listed options.

Volatile memory devices

The following table lists the volatile memory devices in the TTI products and memory-related information.

Type and minimum size	Function	User modifiable	Data input method	Location	To clear	To sanitize
DDR2 SDRAM 256 MB (master)	Temporary memory used by the microprocessor controller for internal processor operations (on the microprocessor chip)	No	None	U16 and U17 on 2450-140 Digital board	Turn instrument power off	Turn instrument power off
DDR2 SDRAM 128 MB (blaster)	Temporary memory used by the microprocessor controller for internal processor operations (on the microprocessor chip)	No	None	U4 and U5 on 2450-140 Digital board	Turn instrument power off	Turn instrument power off
DDR2 SDRAM 128 MB (display)	Temporary memory used by the microprocessor controller for internal processor operations (on the microprocessor chip)	No	None	U4 and U5 on 2450-110 or 389536900 Display board	Turn instrument power off	Turn instrument power off

Nonvolatile memory devices

The following table lists nonvolatile memory devices and memory-related information. If the table indicates that a device can be cleared by the user, see the detailed instructions in Clearing data (on page 5).

Type and minimum size	Function	User modifiable	Data input method	Location	To clear	To sanitize
NOR FLASH embedded memory, 32 MB (master)	Contains calibration data and user settings	Yes	Front-panel or remote interface control	U58 on the 2450-140 Digital board	Follow the "Clearing data" procedures	Remove chip
NOR FLASH embedded memory, 32 MB (blaster)	Contains calibration data and user settings	Yes		U14 on the 2450-140 Digital board	Follow the "Clearing data" procedures	Remove chip
NOR FLASH embedded memory, 32 MB (display)	Contains some user settings	Yes		U14 on the 2450-110 or 389536900 Display board	Follow the "Clearing data" procedures	Remove chip
Flash-based FPGA	Programmable logic	No	Firmware upgrade process	U68 on 2040-100 board U2 on 2450-100 board	Requires Actel ProASIC3 programmer to J46 (on 2040-100) or J829 (on 2450-100)	Remove chip

Clearing data

You can use TSP scripts to clear data. You can run these scripts from the front panel using a flash drive or run them remotely.

Clearing data scripts and setups

To clear the data scripts and setups:

1. Set the correct command set:

    ```
    *LANG TSP
    ```
2. Erase user strings from nonvolatile memory:

    ```
    for name in userstring.catalog() do
       userstring.delete(name)
    end
    ```
3. Erase scripts and configuration lists from nonvolatile memory:

    ```
    for name in script.user.catalog() do
       script.delete(name)
    end
    ```
4. **Source-measure instruments only (2450, 2460, 2461, and 2470):** Set the GPIB address to the factory default:

    ```
    gpib.address = 18
    ```
5. Digital multimeters only (DMM7510): Set the GPIB address to the factory default:

    ```
    gpib.address = 16
    ```
6. Set the command set to SCPI:

    ```
    *LANG SCPI
    ```

Resetting the instrument

These steps only reset the volatile memory. Resetting the volatile memory restores the instrument to the factory defaults.

If you are using the SCPI command set:
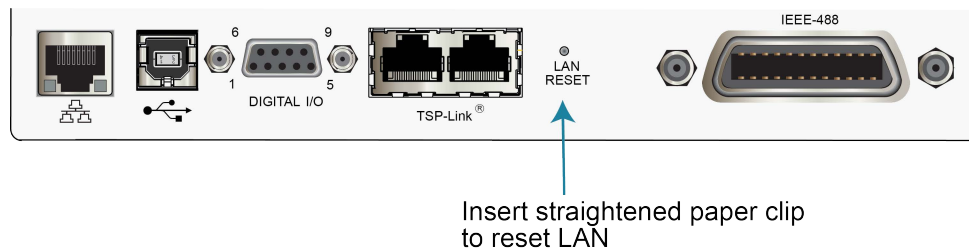
```
*RST
```

If you are using the TSP command set:

```
reset()
```

LAN reset

LAN RESET resets the LAN settings and the instrument password to the factory default values.To do this reset, insert a straightened paper clip into the hole labeled LAN RESET.

LAN RESET is on the rear panel on the instruments. See figure below.

Figure 1: LAN Reset location

Insert straightened paper clip
to reset LAN

Sanitize instrument data

The only way to sanitize data from an instrument is to physically remove the nonvolatile memory devices listed in the tables above.

Sanitize a nonfunctional instrument

To sanitize a nonfunctional instrument, remove the Digital and Display boards and return the instrument to Keithley Instruments for installation of replacement boards.