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# Destruction of Data in Non-Volatile Memory in Keithley Model 24xx

The Keithley Model 24xx series of products contain non-volatile memory devices to hold firmware code that is executed by an internal microprocessor to operate the product or to store product setup or data for later download and analysis. The following sections describe how the data, stored in the memory devices, may be cleared or destroyed.

## Description of memory devices and their use:

- 2 of 256k by 8 bit Flash ROM: Stores firmware for the instrument. These parts are currently in a socket.
- 2 of 128k by 8 bit Battery-backed Static RAM: Stores readings (measurement data), math expressions, memory sweep values, and user setups. These parts are soldered in place.
- 1 of 256 by 8 bit Serial EEPROM: Stores user setup 0 for the instrument. It also contains the model number, serial number, calibration constants, and date of calibration. Only the user setup 0 is considered user accessible data, although a knowledgeable user can change the date of calibration. This part is soldered in place.

## Procedure for clearing memory content:

## 1. Erasing Battery-backed Static RAM (user setups, readings, sweep data, math functions) and User Setup 0 in the Serial EEPROM:

This procedure overwrites the contents in the 2 of 128k by 8 bit Battery-backed Static RAM and overwrites User Setup 0 in the 1 of 256 by 8 bit Serial EEPROM.

1.1. From the front panel:
NA. There is no simple front panel procedure that will clear the entire contents of the Static RAM.

1.2. From the bus:
Send :SYST:PRES command, then send :SYST:MEM:INIT command.

## 2. Destroying operating firmware in the 2 of 256k by 8 bit Flash ROM:

This procedure overwrites the content of the 2 of 256k by 8 bit Flash ROM with the 24xx operating firmware (Step 2.2) or completely and permanently destroys the ROMs and their content (step 2.3)

2.1. The operating system resides in Flash ROM. It is reprogrammable to allow field firmware updates. The reprogramming of this memory requires a software program, called the Flash Wizard, provided by Keithley Instruments Inc. If data (other than the 24xx operating system) was loaded into these memory devices, the 24xx would be non-functional.

2.2. To overwrite any suspect content in these memory devices, follow the instructions with the Keithley Flash Wizard and reload the operating firmware, using the original revision that came with the product when new, or a compatible upgrade version. The Flash Wizard first clears all content in these memory devices then overwrites them with the new the firmware Note: the firmware that is used for the upload must be know to be valid and kept secure to prevent tampering.

2.3. We do not currently offer a program to just erase this code. Complete destruction of firmware requires physical removal of integrated circuits and destruction of the integrated circuits. Note: after this action the unit is unusable.


If you have any further questions or comments, please feel free to contact my office at anytime.

Regards,

William Pelster
Director of Quality