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Destruction of Data in Non-Volatile Memory in the Keithley Model 2701

The Keithley Model 2701 contains memory devices to hold firmware code that is executed by internal microprocessors to operate the product and memory to save setup information and data. The following sections describe how the data stored in the memory devices may be cleared or destroyed.

Warning: Some of the procedures in this document may expose hazardous voltage and the risk of electric shock or death. Only trained, qualified, technical persons experienced with the risks and precautions of servicing electrical instruments should perform these procedures.

Description of memory devices and their use:

4. Several microprocessors - contains some RAM (16kbyte cache, 8kbyte cache, and 2 blocks of 2kbyte SRAM) for internal use and all information is lost when the unit is powered down.
5. Boot Block Flash memory (4Mbyte, non-volatile) – stores the operating software for the instrument and user setups.
6. FRAM (256kByte, non-volatile) – Stores calibration constants and other internal data for the instrument.
7. SDRAM (2 blocks of 8Mbyte, Battery backed-up) – Stores the code from the boot block memory when the instrument is running and buffered readings when programmed.

Procedure for clearing memory content:

Note: If the Model 2701 starts and operates properly when powered on, it is very unlikely that the Boot Block Flash memory was compromised. The microprocessor does a self test including a checksum of the memory. Any difference in the contents from the original programming will usually cause a checksum error or the unit will not function.

Warning: Follow all instructions, including safety warnings, in the service sections of the Model 2701 manual when performing the following steps.

1. Microprocessors – Power down the instrument for ten minutes.
2. Boot Block Flash memory (non-volatile):
To clear user setups:
Recall the factory setup
Press SHIFT then SETUP to display the restore menu.
Use the right arrow to select the factory setup (FACT)
Press ENTER.
Save the setup to overwrite any user setup information
Press SHIFT then SAVE to access the save setup menu.
Use right arrow to select the first user memory location (SAV0).
Press ENTER.

Repeat for the remaining user locations using the up and down arrows to select SAV1 through SAV4.

To clear the operating software:

To allow field upgrade to the operating software, this memory device may be reprogrammed using a program, called the Flash Wizard, provided by Keithley Instruments Inc. If data (other than the 2701 operating system) was loaded into this memory device, the 2701 would be non-functional. 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 known to be valid and kept secure to prevent tampering.

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

3. FRAM (non-volatile) – Perform an instrument initialization and calibration per instructions in the service manual to overwrite the contents.
4. SDRAM (Battery backed-up): WARNING – This procedure may expose hazardous voltage. Follow all safety precautions in the service manual! UNPLUG THE INSTRUMENT. Follow instruction in the service manual to remove the outer chassis and unplug the battery for 10 minutes.

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

Regards,



William Pelster
Director of Quality