

January 11, 2010

## **Destruction of Data in Non-Volatile Memory in the Keithley Model 2182(A) Nanovoltmeter**

The Keithley Model 2182(A) contains memory devices to hold firmware code that is executed by an internal microprocessor to operate the product and memory to save setup information. 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 working with electrical instruments should perform these procedures.**

### **Description of memory devices and their use:**

1. 2 of 512k by 8 bit CMOS Flash Memory: Stores firmware for the instrument.
2. 2 of 32k by 8 bit Static CMOS RAM: Stores user relay configurations. There is NO battery backup.
3. The microprocessor is a Motorola 68306™ (or equivalent) and does not contain general use memory.

### **Procedure for clearing memory content:**

Note: If the Model 2182(A) starts and operates properly when powered on, it is very unlikely that the ROM 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 2182(A) manual when performing the following steps.**

1. 2 of 512k by 8 bit CMOS Flash Memory:  
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 operating system) was loaded into this memory device, the unit 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 circuits and destruction of the integrated circuits. Note: this action renders the unit unusable.

2. 2 of 32k by 8 bit Static CMOS RAM: Turn unit off for one (1) minute.
3. Microprocessor registers and internal memory: Turn unit off for one (1) minute.

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

Regards,



William Pelster  
Director of Quality