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Letter Of Volatility
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LabJack UE9 and UE9-Pro

Following is an overview of the memory spaces available on the UE9.

Note that the UE9 contains two processors referred to as "Comm" for communication and "Control."

Access methods are described for firmware Control 2.26 and Comm 1.58.

All volatile memory is cleared by any reboot. In the specific case of removing/losing power supply voltage, it takes about 1 millisecond after losing the power supply for the UE9 supply voltage to drop below the brown-out voltage, so power supply loss of 1 millisecond or more will result in a reboot when the power supply returns..

Memory Areas:

Bold items are memory areas designed to allow the user to store non-volatile information.

- Control data memory, 8448 Bytes SRAM (volatile)
  - Statically assigned variables.
- Control program memory, 128 kBytes Flash (non-volatile). The program memory is code-protected to prevent general reading through the programming interface.
  - Main firmware image. Written by the Bootstrap.
  - Bootstrap image. Loaded during factory setup.
  - **User Area**, 1 kBytes. Read and write access through the command interface. Access is described in section 5.3.10, 5.3.11, and 5.3.12 of the user's guide. To clear the User Area use the erase function described in 5.3.12.
  - Reserved Areas
    - Calibration Constants. Read and write access through the command interface.
    - **Startup Settings.** Values saved are described in section 5.3.24 of

the user's guide, see section 5.3.23 for the clear command.

- **Watchdog Settings.** Values saved are described in section 5.3.13.3. Settings can be cleared using the function described in 5.3.13.3.
- Device information such as SN and MAC. Read and write access through the command interface.

- Comm data memory, 4 kBytes SRAM (Volatile).
  - Static and dynamic variable storage.
- Comm Program Memory, 16 kBytes SRAM (Volatile).
- Stream Data Buffer, 512 kBytes SRAM (Volatile).
- Comm Program Memory, 64 kBytes Flash (Non-Volatile). The program memory is code-protected to prevent general reading through the programming interface.
  - Main firmware image.
  - **Configuration parameters** such as IP address. There are specific functions to read configuration parameters (CommConfig), but otherwise there is no designed mechanism for the user to read this memory. To clear write default or junk values using the CommConfig function described in section 5.2.1.
- Comm Self-Upgrade Memory, 512 kBytes Flash (Non-Volatile). Only used to temporarily store new firmware that is loaded into the Comm processor. There is no designed mechanism for the user to read this memory.

Clear All User Memory:

1. To clear non-volatile user memory, the bold items above are cleared as described above. Clear the following:

- User Area
- Startup Settings
- Configuration parameters
- Watchdog Settings

2. To clear all volatile memory power-down or reboot the device.

Note that this clearing procedure clears *all memory designed for user access*, not *all memory*. If all memory was cleared, including things like calibration and firmware, the device would be unusable. Of particular note is that the Flash Reserved Area is not an area that an end user will write to during routine operation, but this area is writeable and readable through the command interface. Some areas of the Reserved Area contain factory stored information critical to the basic operation of the device, and thus those areas are not cleared by the clearing procedure described here. It is possible that someone with malicious intentions could store information in the Reserved Area for later retrieval after clearing.