## Equipment Affected

This field service bulletin applies to the following instruments:
- SBE 39plus units with firmware version 4.3.0 and below.
- SBE 39plus-IM units with firmware version 4.5.0 and below

NOTE: This does NOT apply to the SBE 39. For 39plus firmware versions below 4.3.0 and 39plus-IM firmware versions below 4.4.0, refer to the note at the end of the application note for additional instructions.

Problem Description

The original 39plus/39plus-IM firmware will begin erasing data after filling half of the internal memory. **Upon reaching the halfway point in the memory, the 39plus will sequentially erase one block of samples for every new block started, where one block consists of approximately 1365 samples when recording temperature, pressure, and time, and 2340 samples if recording Temperature and time only.** The diagram below demonstrates how blocks of samples are erased for a 39plus recording temperature, pressure, and time:
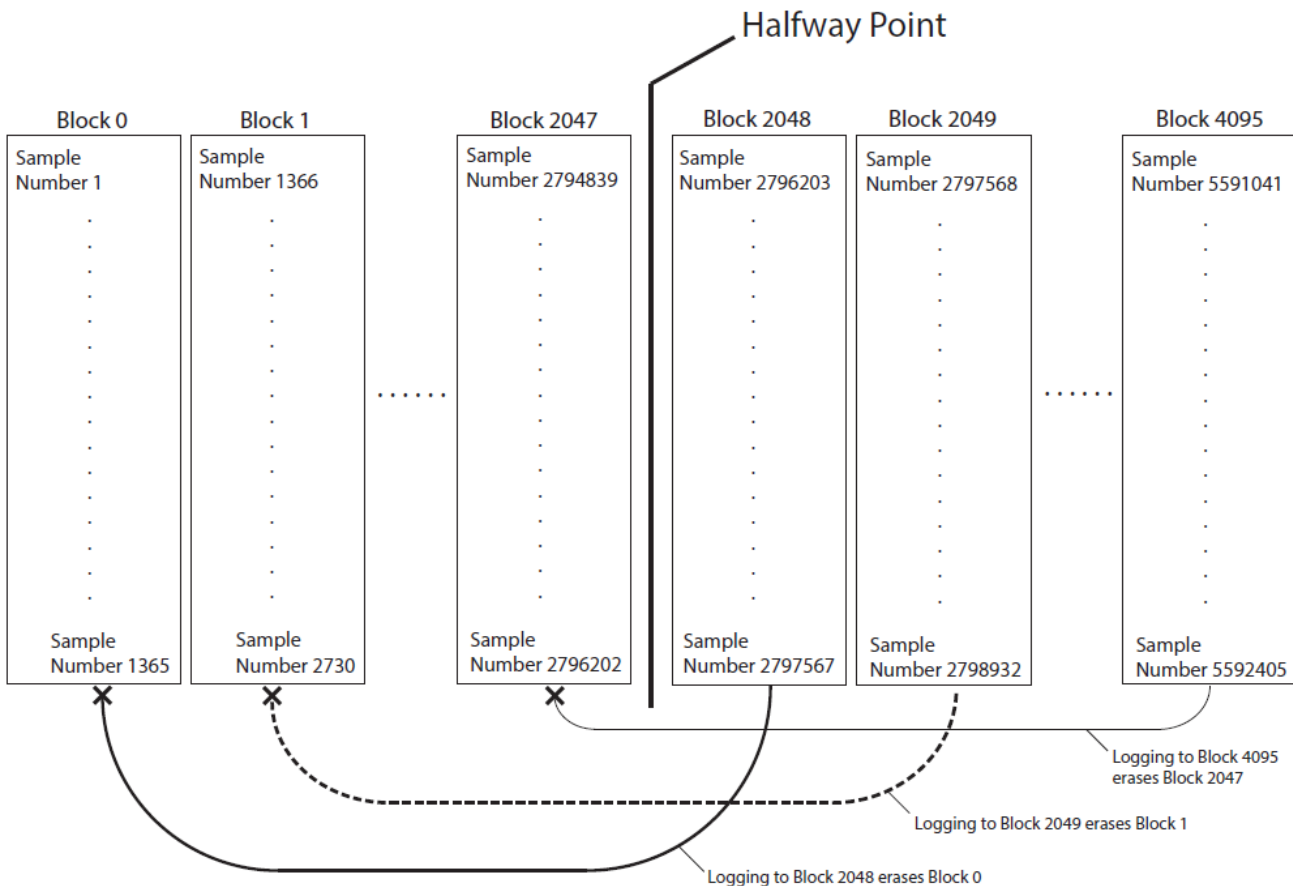
1. The 39plus sample pointer reaches the halfway point (sample number 2796202)
2. It begins writing data to Block 2048 (starting sample number 2796203). Block 0 is erased (samples 1 – 1365)
3. If the sample counter reaches Block 2049 (starting sample number 2797568), the 39plus will also erase Block 1.
4. This continues until the sample counter reaches the end of the memory.

If the 39plus/39plus-IM fills the 64 Mb memory, the entire first half of the memory (sample numbers 1 – 2796202) will be lost. The second half of the memory will always remain intact.

The maximum number of lost samples is:
- 4,793,490 samples if logging temperature and time.
- 2,796,202 samples if logging temperature, pressure, and time.

NOTE: The 39plus/39plus-IM memory is not affected until the sample counter has reached the halfway point.

Solution

Sea-Bird has updated the 39plus and 39plus-IM firmware to eliminate this bug.
- SBE 39plus units must be upgraded to firmware version 4.3.2
- SBE 39plus-IM units must be upgraded to firmware version 4.5.2

If your 39plus has firmware version 4.3.0 and below, or 39plus-IM has firmware version 4.5.0 and below, download the following files:
- 4.3.2 firmware and uploader for the **39plus ONLY:**
  http://www.seabird.com/download/firmware/39plus-39plus-IM_Firmware_Update/39plus_Firmware_Update.zip
- 4.5.2 firmware and uploader for the **39plus-IM ONLY:**
  http://www.seabird.com/download/firmware/39plus-39plus-IM_Firmware_Update/39plus-IM_Firmware_Update.zip

The upgrade process and firmware uploader software are the same for the 39plus and the 39plus-IM

How to Upgrade the Firmware:

1. Connect your 39plus/39plus-IM to SeaTermV2. Click on the "Capture" button at the top menu and create a capture file called "pre-upgrade.cap"; this file will record the pre-upload settings.
2. Send the commands "DS" and "GetCC"
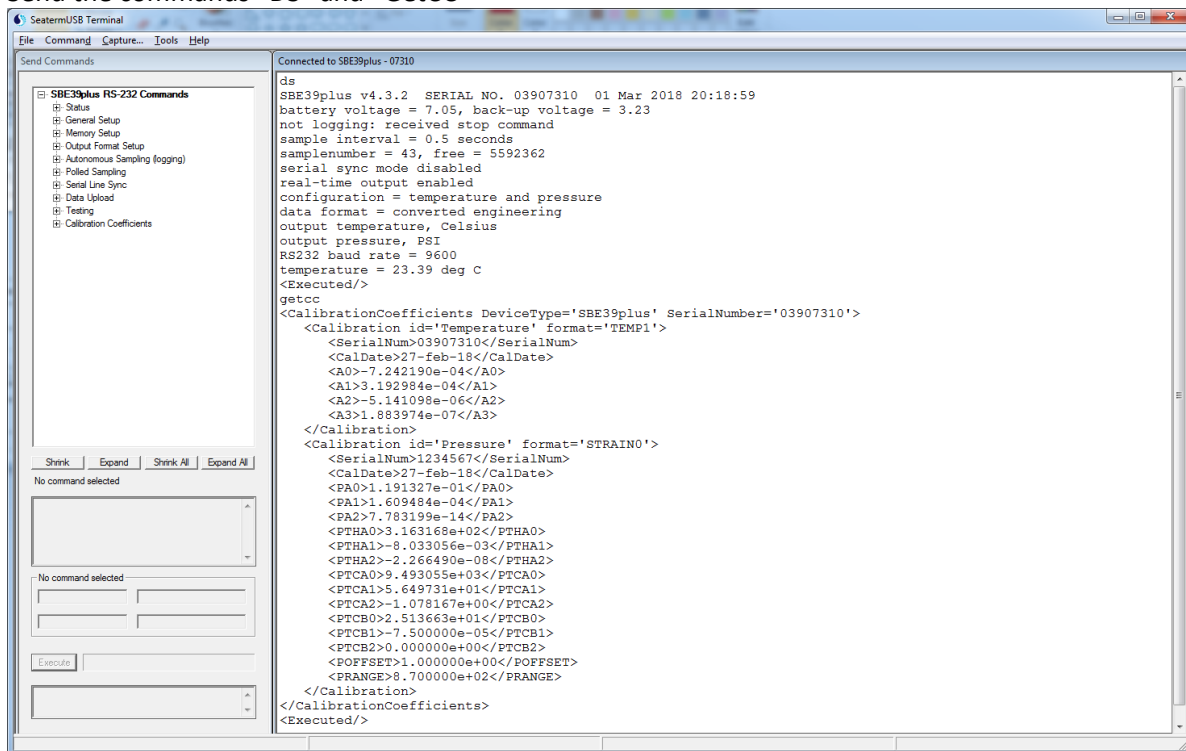
3. Upload any desired data from the 39plus memory.
4. Connect one 39plus via the internal USB connector – do not connect multiple units simultaneously. NOTE: the firmware loader does not work with the RS-232 connection.
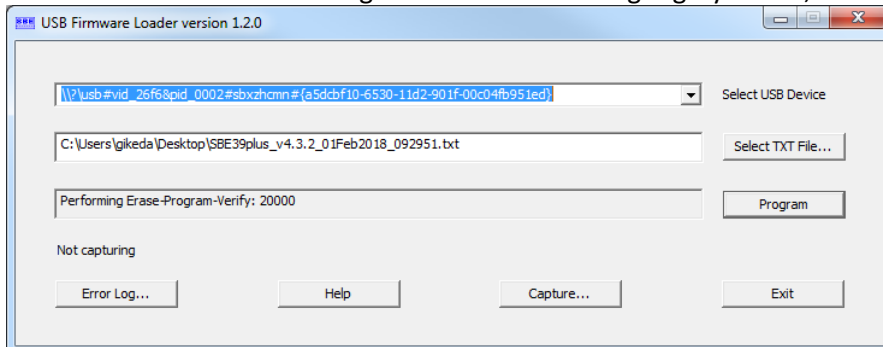

5. Launch the USB Firmware Loader version 1.2.0
6. In the USB Firmware Loader software, click on the drop-down arrow next to "Select USB Device" and select the only available option. This will be a string corresponding with the ID of the connected 39plus. NOTE: if you have multiple 39plus units connected, you will not be able to discern which 39plus you are upgrading.
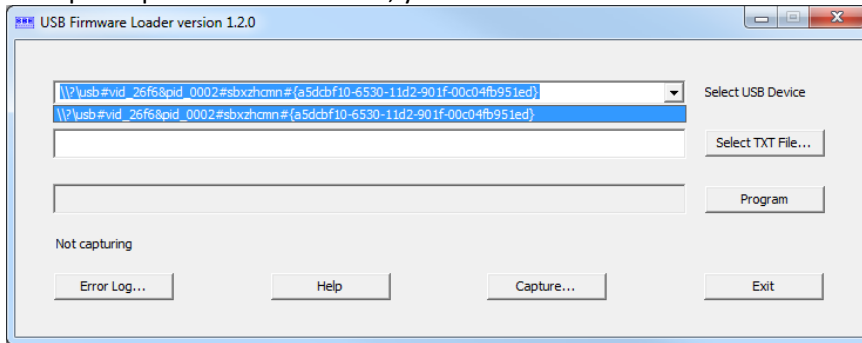
7. Click on "Select TXT File" and select "SBE39plus_v4.3.2_01Feb2018_092951.txt" if upgrading a 39plus, or "39plus_v4.5.2_b282_31Jan2018_190434.txt" if upgrading a 39plus-IM.
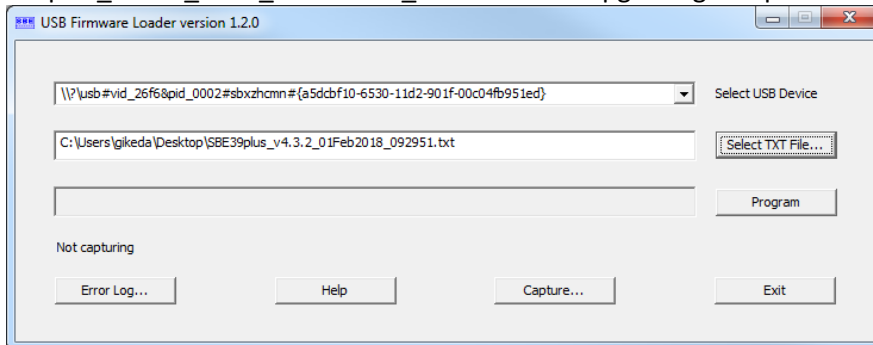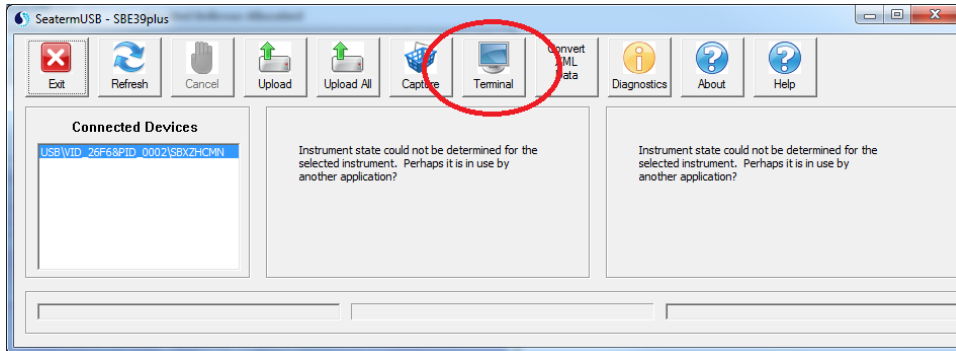

8. Click on "Program". The Firmware Loader begins updating the 39plus firmware. DO NOT DISCONNECT THE INSTRUMENT. When the "Program" button is no longer grayed-out, the firmware update is finished.
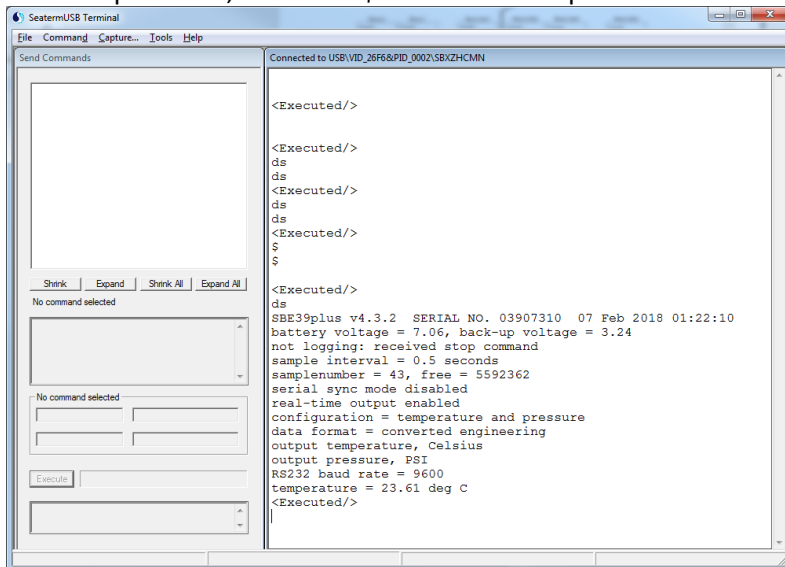
9. Close the USB Firmware Loader and launch SeaTermV2 → SBE 39plus USB (or SBE 39plus IM USB)
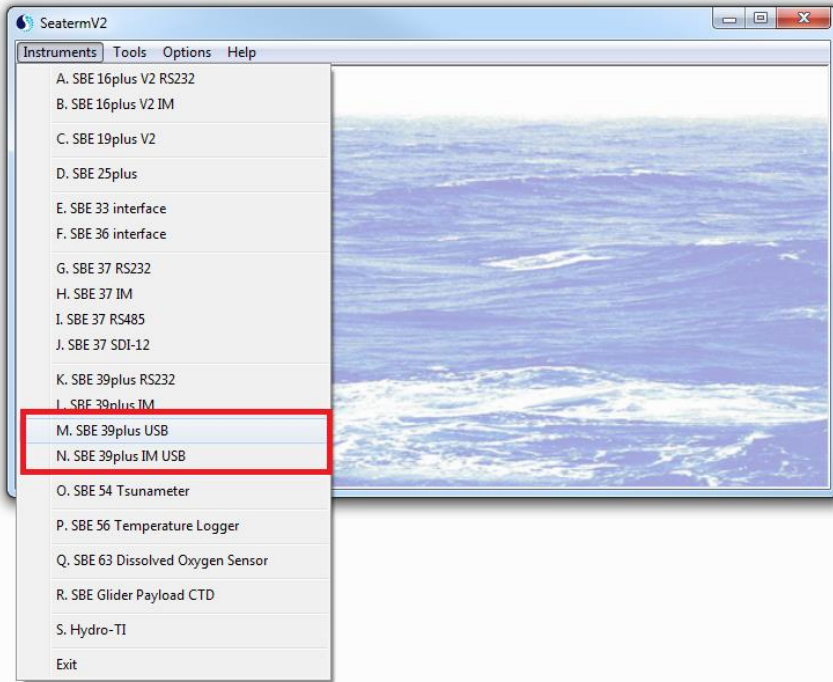
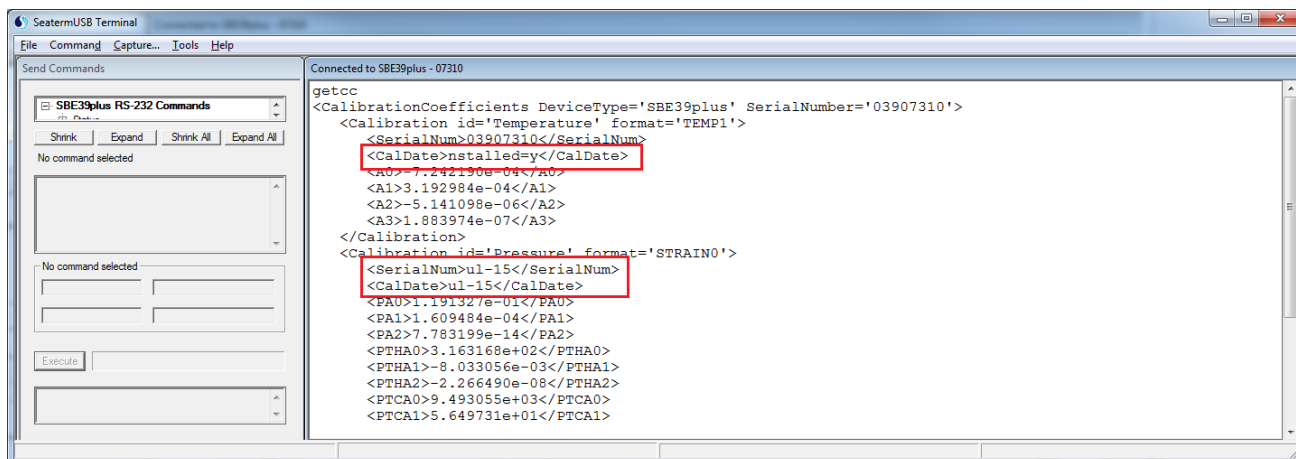10. Launch the Terminal Interface from SeaTermUSB

11. The 39plus/39plus-IM will still be in bootloader mode and will not respond to commands or log data. To restore normal operations, send the "$" character and press the Enter key.

12. Resend the "ds" command to verify that the 39plus/39plus-IM is responding to commands, and verify that the firmware version is 4.3.2 (for the 39plus) or 4.5.2 (for the 39plus-IM).

Note For Upgrading Older Firmware Versions:
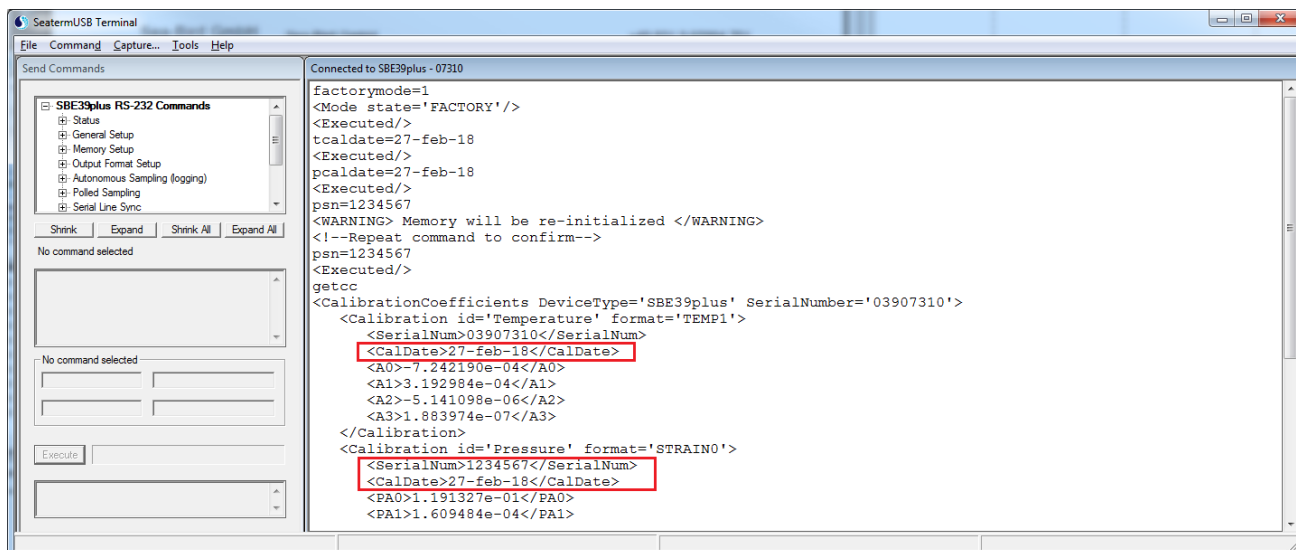
If the 39plus firmware version was below v4.3.0 prior to upgrading to v4.3.2, or the 39plus-IM firmware version was below v4.4.0, the firmware upgrade process will change the temperature and pressure calibration dates and the pressure sensor's serial number. The "GetCC" command shows this:

While not crucial for the instrument's operation, these can be easily fixed with a few commands. To change them back, connect your 39plus/39plus-IM to SeaTermV2, upload any necessary data from the memory, and send the following commands:

- Factorymode=1
- Tcaldate=dd-mmm-yy (example: Tcaldate=27-feb-18)
- Pcaldate= dd-mmm-yy (example: Pcaldate=27-feb-18)
- Psn= ####### (example: Psn=1234567)
    - This command must be sent twice, and will reset the memory
- GetCC
- Factorymode=0

The original Calibration Dates and Pressure serial number are saved in the pre-upgrade.cap capture file created before upgrading the firmware. If you do not have this data, contact Sea-Bird for calibration records.