SATA Firmware Update Instructions

Constellation ES.3 SATA firmware update version SN07

This firmware update is for the Seagate Constellation ES.3 SATA family only.

Backup all data contained on the drive prior to running the update.

See the End User License Agreement below for specific information about these software tools.

This firmware release only supports the following models:

Constellation ES.3 SATA 512N (Megalodon)

Models	Part number	Firmware File
ST1000NM0033	9ZM173	ConstellationES3-Megalodon-SATA-StdOEM-SN07.lod
ST2000NM0033	9ZM175	ConstellationES3-Megalodon-SATA-StdOEM-SN07.lod
ST3000NM0033	9ZM178	ConstellationES3-Megalodon-SATA-StdOEM-SN07.lod
ST4000NM0033	9ZM170	ConstellationES3-Megalodon-SATA-StdOEM-SN07.lod

Note: The firmware above does NOT support SAS, SED or any other default sector size other than 512N. It is only for the four models listed above.

If your current Constellation ES.3 SATA firmware does not begin with the digits "0001", "SN03", "SN04", "SN05", "SN06" or "SNA7" then you have a configuration which is not compatible with SN07. Otherwise, you might have a unique OEM version in which case please contact your OEM for firmware updates for these drives.

Warning, possible loss of data if this firmware is downloaded to unsupported models!

DO NOT run this firmware update on RAID systems.

DO NOT turn the power off during the firmware update procedure.

BEFORE YOU BEGIN:
1. Make sure you have backed up all of your important files and critical data.
2. Save any work in progress.
3. Close all other open applications.
4. Disconnect all external storage devices.

Always handle the drive carefully so you do not cause internal damage to the heads and media inside the drives.   Drives are sensitive devices.

A warning about RAID

RAID systems are extremely sensitive to disruptions to individual drives. It is not uncommon for low level disk drive diagnostics to cause RAID management software to fault a drive that is slowed down by testing or firmware download. For this reason, we highly recommend that you use disk management tools provided by your RAID controller manufacturer if they are available. If these tools are not available, you might consider taking the RAID offline to a maintenance mode or rebooting the system to temporary bootable media and running diagnostics from there. Seagate recommends that you use disk utility tools provided by your RAID controller manufacturer.

Among others, RAID management software is available from 3Ware, Adaptec and LSI.

Here are the instructions for updating SATA firmware:

The method you choose to update the firmware on the drive will depend on your operating system, system utilities or work bench environment.

Bootable Tools

Windows operating systems do not tolerate firmware downloads to SATA disk drives while Windows is running. In this case, we recommend that you prepare the bootable bootable USB flash drive solution. Bootable tools are the obvious choices for new, unformatted drives.

- The bootable USB setup tool is a Windows EXE which formats the USB flash drive and copies all the necessary firmware files. (All previous data on the USB flash drive will be lost.)

Bootable tools are the best choice when downloading firmware to multiple drives. Attach the drive(s) to be updated to a non-RAID SATA controller (JBOD).   An embedded SATA controller on the motherboard works best. Attach the first drive to Port 0 of the SATA controller. If doing multiple drives at once, we recommend no more than 4 drives at a time off one PC.

Command Line Interface Tools

Two command line interface tools are available for firmware download. Seaflashlin is for Linux only, and is the precursor to SeaChest_Firmware. SeaChest_Firmware is available for both Linux and Windows and they share the same command line structure. Therefore, there are two command line choices for Linux and one for Windows. All of these tools have extensive documentation available.

Note: Windows operating systems do NOT allow firmware download to SATA drives unless the drives support the Deferred Download mode.

SeaChest_Firmware is our most current tool. The Linux version is shown below. The Windows version does not reference devices as "/dev/sg" but rather as PDx. Please see the SeaChest_Firmware for Windows documentation for specific examples.

```
===============================================================================
 SeaChest_Firmware for Linux - Seagate drive utilities
 Copyright (c) 2017 Seagate Technology LLC, All Rights Reserved
 SeaChest_Firmware Version: 2.3.2
 Build Date: Mar 09 2017
===============================================================================
Usage
=====
        SeaChest_Firmware [-d <sg_device>] {arguments} {options}

Examples
========
        SeaChest_Firmware --scan
        SeaChest_Firmware -d /dev/sg2 -i
        SeaChest_Firmware -d /dev/sg2 --fwdlInfo
        SeaChest_Firmware -d /dev/sg2 --downloadFW fwfilename
        SeaChest_Firmware -d /dev/sg2 --fwdlConfig configfile.cfs

Utility arguments  (partial listing)
=================
        -s, --scan
        -F, --scanFlags [option list]
        -d, --device <device handle>
        -i, --deviceInfo
        --SATInfo
        --testUnitReady
        --fwdlInfo
        --downloadFW [fwfilename]
        --downloadMode [full | segmented | deferred]
        --activateFW
        --fwdlConfig [config file]
        --fwdlDryRun
        --fwdlSegSize [segment size in 512B blocks]

Utility Options  (partial listing)
===============
        -h, --help
        -V, --version
        --license
```

First, run the `--scan` option to determine what /dev/sg# assignment lines up to your disk drive. This option also will show you other details about the drive including the current firmware revision. Like this:

```
Vendor      Handle      Model Number      Serial Number      FwRev
ATA         /dev/sg0    ST94813AS         3AA043KP           3.03
SEAGATE     /dev/sg1    ST1000NM0011      ZAA15VAS           SN03
```

The typical ordinary command line looks something like this:

```
SeaChest_Firmware -d /dev/sg2 --downloadFW fwfilename
```

--modelMatch is a model number verification based on the device Inquiry response. --modelMatch scans all sg devices on the system.

The tool has two batch modes, which can be used thusly:

```
SeaChest_Firmware –d * --modelMatch <model_number> --downloadFW fwfilename
```

Note: Use of --modelMatch mode is preferred for batch processing of sg (SCSI generic) SAS disk drives. The --modelMatch mode may also be used on Enterprise SATA disk drives. Desktop and notebook SATA drives firmware is usually combined with a Seagate-prepared CFS firmware configuration file.

The <cfs_file> noted above is a Seagate-prepared compatible firmware selector file which is used to match up the right firmware for a particular SATA drive.

```
SeaChest_Firmware -d /dev/sg2 --fwdlConfig configfile.cfs
```

Note: Batch processing of SATA drives should use a Seagate prepared CFS file.

Both of these modes assume that the relevant firmware files are located in the current working directory.

See the SeaChest_Firmware.-Lin.txt file for a complete description of the software.

seaflashlin firmware loader supports compatible Seagate disk drives listed on /dev/sg devices. The command line instructions for this tool are:

```
==============================================================================
 Seagate Firmware Download Utility.
 Copyright (c) 2016 Seagate Technology LLC, All Rights Reserved
 SeaFlashLin Version: 0.4.8
==============================================================================
Usage
=====
        seaflashlin -f <fw_file> -d <sg_device>
        seaflashlin {-m <model_number> -f <fw_file> | -c <cfs_file>} [-d <sg_device>]
```

```
Example
=======
Specific drive:
        seaflashlin -f test.lod -d /dev/sg0
        (defaults to segment size = 64 and timeout = 5 seconds)

Multiple drives:
        seaflashlin -c barracuda.cfs
        seaflashlin -m ST600MP0005


Control options
===============
        -i      Display identification information (list sg_devices)

        -d, --device deviceHandle
                Use this option to specify the sg device handle on which to
                perform an operation. Multiple device handles can be given.

                Example: -d /dev/sg5

        -f <fw_file>
                The name of the firmware file.

        -x <path>
                To designate alternate location of the firmware files.  Default
                is the current working directory.

        -c <cfs_file>   (SATA only)
                A Seagate-prepared compatible firmware selector file.  All
                drives is the system will be reviewed for new firmware based on
                this CFS file.

        -k <cfs_file>    (SATA only)
                "dry run" test to determine which files and drives are
                supported by a given CFS file.

        -m <model_number>
                The model number of the drive to download firmware. All drives
                is the system with this model number will be selected.  Use a
                CFS first if you have one instead of using this choice.

                Not recommended for batch updates to multiple SATA notebook or
                desktop drives because the model numbers are not exclusively
                defined for just one family.  In other words, two similar
                drives with the same model number may have different part
                numbers and will not share the same firmware file.

Modes and Controls
==================
        -e      Deferred download. Not common. (ATA only)
        -s      Segment size (1 segment = 512 bytes) Default is 64 (32KiB)
        -p      Force ATA passthrough (for SATA)
        -w      Force Write Buffer CMD (for SAS)
        -u      Non-segmented
        -o      Timeout value (seconds).  Default without this option is 5
                seconds.

Utility Options
===============
        -v      Display version and exit (overrides all other arguments)
        -l      Show license agreement
```

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See the seaflashlin.txt file for a complete description of the software.

First, run the `-i` option to determine what /dev/sg# assignment lines up to your disk drive. This option also will show you other details about the drive including the current firmware revision. Like this:

```
/dev/sg0  MN: ST94813AS     SN: 3EE043KP   FW: 3.03
/dev/sg1  MN: ST1000NM0011   SN: Z1M15VAS   FW: SN03
```

-m is a model number verification based on the device Inquiry response. -m mode scans all sg devices on the system, so it is -- in itself -- a batch mode. The -d switch may be used with -m to select a specific device.

The raw tool has two batch modes, which can be used thusly:

```
seaflashlin -m <model_number> -f <fw_file>
```

Note: Use of –m mode is preferred for batch processing of sg (SCSI generic) SAS disk drives. The –m mode may also be used on Enterprise SATA disk drives. Desktop and notebook SATA drives firmware is usually combined with a Seagate-prepared CFS firmware configuration file.

The <cfs_file> noted above is a Seagate-prepared compatible firmware selector file which is used to match up the right firmware for a particular SATA drive.

```
seaflashlin -c <cfs_file>
```

Note: Batch processing of SATA drives should use a Seagate prepared CFS file.

Both of these modes assume that the relevant firmware files are located in the current working directory.

Alternately, these two batch modes may be targeted to a specific device like so:

```
seaflashlin -m <model_number> -f <fw_file> -d </dev/sg#>
```

```
seaflashlin -c <cfs_file> -d </dev/sg#>
```

By specifying -f and -d, without the benefit of requiring a model match with -m or utilizing a Seagate .CFS file, a user may still force a SATA download attempt on any /dev/sg device regardless of type or suitability. Obviously, this use is not recommended for most situations, but is available if needed. Multiple devices can be defined like this:

```
seaflashlin -f <fw_file> -d </dev/sg#> -d </dev/sg#> -d </dev/sg#>
```

<u>Raw Firmware Data Files</u>

You will need the Seagate firmware file to run the simple command line Linux tool. This file will have the .LOD filename extension and should be located in the current working directory. This firmware file should never be used outside of the specific product family models and part numbers listed with the firmware release. Incorrect usage of the .LOD may result in data loss or even product failure. Seagate Technology is not responsible for lost user data. See the End User License Agreement below for specific information about these software tools.

<u>Using Traditional Linux Firmware Tools</u>

For SATA drive firmware downloads you might use the Linux "hdparam" command.

Support

Seagate offers technical support for disk drive installation. If you have any questions related to Seagate products and technologies, feel free to submit your request on our web site. See the web site for a list of world-wide telephone numbers.

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