



SAS Firmware Update Instructions



Constellation ES.1 SAS firmware update version 0008

This firmware update is for the Seagate **Constellation ES.1 SAS** 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.1 SAS (Muskie)

Model	PN
ST3500414SS	9JX242
ST31000424SS	9JX244
ST32000444SS	9JX248

If your current **Constellation ES.1 SAS** firmware does not begin with the digits "000" then you have a customized OEM configuration which is not compatible with 0008. 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.

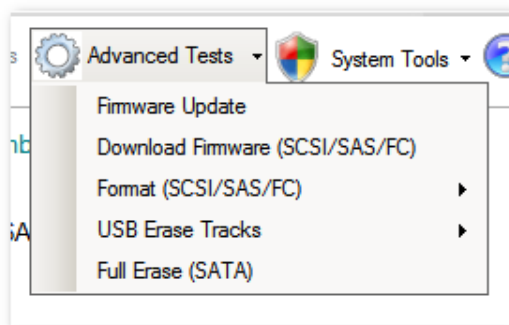
Here are the instructions for updating SAS firmware:

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

Windows Tool

Windows operating systems tolerate firmware downloads to SAS disk drives in JBOD mode. Drives in RAID configurations should not be given new firmware unless a special tool is provided by the RAID controller manufacturer.

Seagate's SeaTools for Windows may be used to download firmware to SAS disk drives in JBOD mode. You will find SeaTools for Windows at www.seagate.com/support/seatools and select the Downloads tab. After SeaTools is installed on the system, you will find *Download Firmware (SCSI/SAS/FC)* on the Advanced Tests menu.



The firmware files will be either .LOD or .SEA file types. **Important:** These files must be copied to the SeaTools for Windows folder.

Linux Command Line Interface Tools

A simple command line interface tool is available from Seagate for Linux based systems. This command line firmware loader (**dl_sea_fw**) is for Seagate disk drives listed on /dev/sg devices. The command line instructions for this tool are:

```
=====
Seagate Firmware Download Utility. Version
Copyright (c) 2013 Seagate Technology LLC, All Rights Reserved
=====

usage:
dl_sea_fw {-m <model_number> -f <fw_file> | -c <cfs_file>} [-d <sg_device>]
dl_sea_fw -f <fw_file> -d <sg_device>

Options:
    -i      PRINT IDENT INFO
    -v      PRINT VERSION AND EXIT (overrides all other arguments)
Modes supported:
    -s      SEGMENT SIZE (1 segment = 512 bytes)
    -p      FORCE ATA PASSTHROUGH
    -w      FORCE WRITE BUFFER CMD
e.g.:
    dl_sea_fw -s 64 -f test.lod -d /dev/sg0
returns:
    0      No error found
    1      Fatal error in command line options
    2      FW Download Failed
    3      Invalid device
```

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:

./dl_sea_fw -m <model_number> -f <fw_file>

Note: Use of **-m** mode is reserved for batch processing of sg (SCSI generic) SAS disk drives.

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.

./dl_sea_fw -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:

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

```
./dl_sea_fw -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:

```
./dl_sea_fw -f <fw_file> -d </dev/sg#> -d </dev/sg#> -d </dev/sg#>
```

Raw Firmware Data Files

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.

Using Traditional Linux Firmware Tools

For SAS drive firmware downloads you might use the Linux "sg_write_buffer" command. The sg command stands for the (SCSI Generic driver) and is an off-the-shelf Linux command that is kept updated by the Linux community. It may be able to work with various RAID cards and see the individual drives. You will need to load the "sg3_utils" package if not already in your Linux kernel.

For Ubuntu _ apt-get sg3_utils

For Fedora/redhat/centros yum install sg3_utils

```
=====
SAS Drive FW Download - use sg_write_buffer
example loads "ST9600205SS_0002.lod" firmware
=====
```

1. Be in the directory where the .lod files is located then run the sg_write_buffer cmd. More details below.
2. On larger code files you must specify --length=file size. Use ls -l command to get the file size of the code (to use in the sg_write_buffer command string

```
# ls -l ST9600205SS_0002_servo-x106.lod
-rw-r--r-- 1 root root 1238016 2011-08-17 10:46 ST9600205SS_0002.lod
```

3. Identify the /dev/sgx device. Run the `lsscsi -g` command to see target devices
/dev/sg#

4. Run `sg_write_buffer` command to the target device. Here is an example of a firmware download to a Seagate Constellation ES.1 model ST9600205SS:

```
# sg_write_buffer -v --in=/var/tmp/ST9600205SS_0002.lod --length=1238016 --mode=5
/dev/sg3
Write buffer cmd: 3b 05 00 00 00 00 12 e4 00 00
```

Or `sg_write_buffer -v --in=<fw file name> -l=<file size> -m=5`

5. Then use Linux SMARTCTL to verify what code is on the disk

```
# smartctl -i /dev/sdc
http://smartmontools.sourceforge.net
Device: SEAGATE ST9600205SS Version: 0002
Serial number: 6XR1xxxx
```

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.

Seagate Support: <http://www.seagate.com/www/en-us/support/>

Contact Us: http://www.seagate.com/www/en-us/about/contact_us

This software uses open source packages obtained with permission from the relevant parties. For a complete list of open source components, sources and licenses, please see our Linux USB Boot Maker Utility FAQ for additional information.

Linux USB Boot Maker FAQ:

http://support.seagate.com/firmware/usbbootmaker_faq.html

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