



## SATA Firmware Update Instructions



### Enterprise Capacity 3.5 HDD SATA SED 4kN firmware update version NS05

This firmware update is for the Seagate Enterprise Capacity 3.5 HDD 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:

### Enterprise Capacity 3.5 HDD SATA SED 4kN (Makara)

Models	Part number	Firmware File
ST2000NM0064	1LY174	MakaraEntCapSATA-SED-4kN-NS05.LOD
ST4000NM0064	1LY178	MakaraEntCapSATA-SED-4kN-NS05.LOD
ST6000NM0064	1LY17Z	MakaraEntCapSATA-SED-4kN-NS05.LOD

**Note:** The firmware above does NOT support SAS, STD or any other default sector size other than 4kN. It is only for the three models in the list above.

STD      Standard  
SED      Self Encrypting Drive  
4kN      4k Native sector size  
5xxE      Advanced Format (512 byte emulation from 4k physical)

If your current Enterprise Capacity 3.5 HDD SATA firmware does not begin with the digits "NS02" then you have a configuration which is not compatible with NS05.

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.

## Linux Command Line Interface Tools

A command line interface tool is available for Linux based systems. **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: 0.4.7
=====

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

#### Return codes

=====

0 No error found  
1 Fatal error in command line options  
2 FW Download Failed  
3 Invalid device  
4 No match in CFS file (SATA only)  
5 FW up to date (SATA only)  
6 Model number mismatch  
7 FW mismatch  
4x Hexadecimal number count of Seagate sg devices in the system. This response code is only returned by the -i system scan argument. Beginning with 41 where x is the beginning of the count of the number of devices.  
Anything else = unknown error

See the seafashlin.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#>
```

### 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 SATA drive firmware downloads you might use the Linux "hdparm" 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.

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

Contact Us: <http://www.seagate.com/contacts/>

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](http://support.seagate.com/firmware/usbbootmaker_faq.html)

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