

Quietly Cool

Hitachi's Deskstar drives can be configured to reduce audible noise and minimize power consumption—making your organization a cooler, quieter place to work.

Low power, high priority

Deskstar drives enable very desirable attributes for both hard drives and the systems that use them. The Deskstars can be configured to reduce both audible noise and reduce power demands. Whenever the system is located near the user, low acoustics are important. Low noise levels can also be important in audio/video production environments.

Power savings are important in all applications. Reducing drive power requirements benefits the system in several ways.

- Less cooling is required
- Less costly power supplies are needed
- Greater reliability for all components can be realized

The follow details describe Hitachi's Deskstar 7K400, 5 platter model. Other Deskstar models also enable reduced acoustics and power. Specifications may vary with each model.

Acoustics management

The Deskstar drives can be configured to the silent seek mode. When this mode is enabled, drive acoustics during seeking drops from 3.5 bels to 3.3 bels. This improvement not only makes for a quieter environment for the user, there is also a power benefit. The drive's power requirement drops significantly during seeking, from 13 watts to 11 watts.

Power management

PC system and other single-drive configurations will realize benefits by utilizing the Deskstar power management capabilities. The hard drive can be under utilized in many single user applications. In these cases, the system can switch the drive to one or more of the power saving modes described below.

Power with control

In addition, ATA 3.5-inch drives are increasingly being used in multi-drive configurations. One typical application is nearline storage, where the drives may remain idle for extended periods. In such an environment, the Deskstar drives' multiple power modes can prove a real advantage.

Deskstar drives have four stages of readiness and each level offers power and cooling benefits. Figure 1 shows the percentage savings and recovery times associated with each mode.

Here is a summary of how each mode can offer you these valuable power savings, again referencing the Deskstar 7K400.

Power Mode	Power Savings (%)	Recovery Time (sec)	Application Examples
Normal	0	0	Online
Unload	24	0.7	Nearline
Low RPM	51	7.0	Archiving
Standby	89	15.0	RAID sparing

Figure 1: Deskstar 7K400 (PATA) Power savings and recovery times in four modes

Normal

In the normal ready mode, the drives respond immediately to system requests for data. The Deskstar drives, in the standard configuration, lead the industry for low power requirements. This, leading low power enables lower cost power supplies and less cooling than required for other ATA drives. Deskstar drives achieve these integration benefits (lower power) while providing industry-leading performance.

Unload

The heads can be sent to the ramp if the drive is idle for several minute intervals. This mode reduces power, since the servo circuit is disabled. 24% less power is required than in the online mode. With a request for data, the drive quickly returns to the online mode for rapid access.

Low RPM

When longer periods of non use occur, additional power savings is possible. In this mode, in addition to head unload from the media, the spindle motor can be slowed to a lower spin rate (approximately 60% of normal). This action further reduces the power needed for the drive, 27% less than the unload mode. In less than seven seconds, the drive can be restored to ready mode for data access.

Standby

One final mode enables the greatest power saving state. In this case, as above, the heads are moved to the ramp. In standby mode, power is removed from the disks. Stopping the disks results in 38% savings over the Low RPM mode, or a huge 87% less than when online.

The standby drive can be quickly brought to the online mode, if for example, one of the active drives is removed from the system. This mode is especially useful in RAID environments where one drive serves as a spare.

Each of the four modes can be enabled via the Set Feature commands. They are described in more detail in the Advanced Power Management section of the Deskstar Hard Disk Drive Specification.

Hitachi Global Storage Technologies trademarks are intended and authorized for use only in countries and jurisdictions in which Hitachi Global Storage Technologies has obtained the rights to use, market and advertise the brand. The Travelstar trademark is authorized for use in the Americas, EMEA, and the following Asia-Pacific countries and jurisdictions: Australia, Hong Kong, Japan, New Zealand, South Korea and Taiwan. Contact Hitachi Global Storage Technologies for additional information. Hitachi Global Storage Technologies shall not be liable to third parties for unauthorized use of this document or unauthorized use of its trademarks.

References in this publication to Hitachi Global Storage Technologies' products, programs or services do not imply that Hitachi Global Storage Technologies intends to make these available in all countries in which it operates.

Product specifications provided are sample specifications and do not constitute a warranty. Information is true as of the date of publication and is subject to change. Actual specifications for unique part numbers may vary. Please visit the Support section of our website, www.hitachigst.com/support, for additional information on product specifications. Photographs may show design models.

© 2007 Hitachi Global Storage Technologies

Hitachi Global Storage Technologies
3403 Yerba Buena Road
San Jose, CA 95135 USA

Produced in the United States 11/07.
All rights reserved.

Microdrive®, Deskstar®, Travelstar® and Ultrastar® are registered trademarks of Hitachi Global Storage Technologies.