

Hitachi GST

an overview of our hard disk drive products



Colossal
Capacity

For more information visit:
www.hitachigst.com

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A drive solution whatever the demand



Embrace the future

No two jobs are the same. In your line of business, you have requirements that range from tried-and-tested computing environments to emerging applications. We're here to help you meet those requirements. That's why we provide the broadest hard disk drive product line available today. A drive solution for every eventuality means you can choose from a full range of high-performance products—from our 2.5-inch mobile Travelstar™ family to 3.5-inch Ultrastar™ enterprise drives with up to 2TB (terabyte) capacity—all with reliability specs our competitors can only look up to.

Hitachi GST Market Segment Overview

Hitachi Global Storage Technologies is always looking at tomorrow. That's why we're busy researching every possible angle to make the performance, capacity and quality of our hard disk drive even better. To allow us to provide you with a HDD for every application.



PC Hard Drives

Our broad line of PC hard drives offers top performance in the office and on the road. Desktop drives provide fast access to up to 2TB of storage. Our notebook drives hit the road with unmatched mobile storage—a spacious 500GB—and exceptional speed, security, ruggedness and power efficiency.



Consumer Electronics Hard Drives

High-definition video, MP3s, digital photos and more... whenever consumers create, share or simply record their rich media for later enjoyment, they have to store it somewhere. That requires massive capacity, but also quiet operation, the highest reliability, a low power draw, compact size and affordability. Hitachi offers it all.



Enterprise Hard Drives

Enterprise-wide data storage and access can be complex and demanding. Hitachi enterprise drives are designed for mission-critical applications where information has to be served up fast 24x7 and where infrequently accessed information requires huge capacity at minimal cost.



External Storage

Hitachi delivers innovative consumer, small business and professional external storage solutions for the Mac™ and PC markets.

Mac is a trademark of Apple, Inc.



Surveillance Hard Drives

Hitachi surveillance drives are designed for environments where 24x7 operation and high reliability are critically important. Optimized to record multiple, simultaneous video streams, Hitachi drives serve the indoor video, enterprise and mobile surveillance markets.

Hitachi GST Product Overview

Product Families



Ultrastar™ Hard Drives

Hitachi delivers solutions to a broad range of enterprise storage systems, from business-critical high-capacity storage applications to mission-critical servers. With products at 15,000 RPM, small form factor 10,000 RPM, and 7200 RPM SATA, Hitachi Ultrastar products offer high data throughput for data-intensive applications, with the highest quality and superior performance, more powerful processors and read/write channels to ensure excellence in enterprise-class environments.



Deskstar™ Hard Drives

Hitachi offers a broad range of 3.5-inch hard disk drives and the highest capacities available, including the industry's first 7200 RPM 2TB hard drive. Deskstar drives are designed for both traditional and advanced desktop applications, such as multimedia, 3D graphics, gaming and digital photography. Deskstar drives include advanced features such as SATA 3Gb/s interfaces, Native Command Queuing, low power utilization and quiet acoustics. These features combine to make the Deskstar ideal for

standard PC systems, as well as nearline storage, digital video recorders and other non-PC computing applications.



Travelstar™ Hard Drives

Hitachi has the industry's broadest mobile product line. The Travelstar portfolio offers substantial benefits in the traditional notebook PC market, as well as other applications like gaming, telemetry and entertainment systems. State-of-the-art noise suppression technology ensures that the Travelstar series offers industry-leading acoustic performance, and generations of industry-leading power management technology helps extend system battery life. Travelstar drives offer choices in capacities up to 500GB and RPM performance up to 7200 RPM.



CinemaStar™ Hard Drives

CinemaStar hard disk drives are optimized for streaming video applications like surveillance systems and high-definition digital video recorders

(DVRs). Hitachi has designed CinemaStar products to provide features for quiet acoustics and power efficiency to deliver customer satisfaction and field reliability. Advanced features include SMART Command Transport and Thermal Fly-height Control to adapt error correction and environmental system conditions to improve the streaming experience and overall video quality.



Endurastar™ Hard Drives

Endurastar hard drives are designed specifically to perform in extreme temperature environments and are ideal for automotive entertainment and navigation applications. With a wide operating temperature range, Endurastar products are built to perform in the harshest environments—from desert heat to Antarctic chill.

One GB is equal to one billion bytes and one TB equals 1,000 GB (one trillion bytes) when referring to hard drive capacity. Accessible capacity may be less.

Ultrastar, Deskstar, Travelstar, CinemaStar and Endurastar are trademarks of Hitachi Global Storage Technologies. Hitachi Global Storage Technologies trademarks are authorized for use in countries and jurisdictions in which Hitachi has the right to use, market and advertise the brands. 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 for further information. Hitachi shall not be liable to third parties for unauthorized use of Hitachi trademarks.

Hitachi GST Product Overview

Consumer and Small Business External Storage

SimpleTech™ by Hitachi blends the best of form and function to earn its reputation as one of the leading PC consumer storage brands on the market, known best for being innovative, stylish,



and above all, simple to use. As a result, Hitachi external storage products for consumer and small business go far beyond the typical “drive in a box.” They integrate with robust services and software

such as Joggle and Hitachi Ultimate Backup, giving you the ability to store, backup and manage your digital media when and where you need it, beyond just the drive itself. With a passion like no other, Hitachi challenges the expectations of how, where and when you experience your digital content.

Audio/Video and Content Creation External Storage

G-Technology™ by Hitachi delivers the industry’s most comprehensive line of external disk storage solutions designed for Mac™ users and the professional content creation market. From rugged, portable, FireWire bus-powered RAID solutions to ultra-fast rack mount Fibre Channel and miniSAS

arrays, every G-Tech product is tested to insure maximum performance.

USB, FireWire, eSATA, SCSI and Fibre Channel systems support all levels of audio/video production. G-Tech’s focus on technology, quality and design has resulted in disk storage solutions with unmatched performance, reliability and style, making them the defacto standard in Post Production facilities worldwide.



Hitachi GST Global Operations

Hitachi GST has a relentless focus on leveraging its technology leadership to delight customers around the globe. Headquartered in San Jose, California, the company manufactures components and hard drives at six different locations worldwide. These facilities are strategically located near major customers, suppliers and partners. Hitachi GST is committed to customer satisfaction and provides customer support and service operations throughout the world. The company also has world-class research and development teams located in multiple geographies, which are easily accessible to our factories for pilot-line testing.



Open the door to a colossal 2TB of storage space

Ultrastar™ A7K2000 delivers capacity, reliability and performance.



Ultrastar™ A7K2000

The industry's first shipping 2TB, 7200RPM, enterprise-class hard drive.

Size:	3.5-inch
Capacities:	500GB to 2TB
Speed:	7200 RPM
Interface:	SATA 3Gb/s
Targeted MTBF*:	1.2M hours
Warranty:	5 years

This MTBF target is based on a sample population and is estimated by statistical measurements and acceleration algorithms under nominal operating conditions. MTBF ratings are not intended to predict an individual drive's reliability. MTBF does not constitute a warranty.

Help your customers reach expansive new dimensions in storage-intensive enterprise applications including data warehousing, disk-to-disk backup and cloud computing. The Ultrastar A7K2000 delivers Hitachi reliability combined with double the data storage density and a 120% improvement in watts-per-GB compared to our A7K1000.

www.hitachigst.com/ultrastar

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Hitachi Partners First Program



Our Partners First™ program gives Hitachi GST's partners access to a wide range of invaluable tools and resources which will save you time and help you make the most of Hitachi hard drives. This invaluable technical and business support is available just when you need it.

We operate a three-tier partner system depending on your needs and the kind of business you operate. Stage one partners are Red; mid-tier partners Silver, and premier partners Black. Each is offered a package of tailored support and services.

- **Technical support** – this includes 24x7 email and telephone support; an up-to-date, online product library of technical documents, presentations, product specifications and agency approval letters for all Hitachi hard drives; online diagnostic tools for analyzing, monitoring and restoring Hitachi drives; and integration and developer support to help market new applications
- **Value-added support** – relationship management resources so we can better

understand each other's businesses; help with the returns process via our secure website; the HDD Info Hub, a unique online interactive resource that compares the specifications of the industry's hard disk drives; Hitachi Partners Privilege (HPP)* program to reward partners for their loyalty and continuous efforts

- **Marketing support** – help with printed marketing materials, dealing with the press, and profile-raising at industry events. In addition, Partners receive a quarterly e-newsletter, available in six languages, and training opportunities

*HPP reward program applies to Asia Pacific region only.

For more information, or to register for Partners First, visit www.hitachigst.com/partners

Partners First Program has been carefully designed to provide all the information and tools you need for selling and designing in Hitachi hard drives. Our reasoning is simple—your success is our success. By giving you access to essential tools and resources, we can build a positive, practical working relationship—one that benefits us both, and keeps us ahead of the competition.



Hitachi Technologies

Technical Highlights



First to market advantage

Hitachi began manufacturing products based on Perpendicular Magnetic Recording (PMR) technology in May 2006 when the company introduced the Travelstar™ 5K160 which was hailed as the most reliable and technically advanced 2.5-inch hard drive on the market at the time. Hitachi built on this success by introducing the first 1TB drives in the first quarter of 2007 and followed through with the Travelstar 5K500, the first 500GB 2.5-inch mobile drive, in the first quarter of 2008. With the Travelstar 5K500, Hitachi has effectively eliminated the “capacity compromise” by offering consumers all the storage capacity of a desktop with the portability and convenience of a notebook.

Hitachi load/unload technology

Load/unload technology ensures that the read/write heads never come into contact with the media - even when the drive is not rotating. Some of the many benefits include increased robustness, reliability and reduced power consumption. Hitachi leads the industry in using load/unload technology across the complete product line.

Rotational Vibration Safeguard (RVS)

Several Hitachi hard drives now have advanced Rotational Vibration Safeguard (RVS) that actually anticipates disturbances and counteracts them—maximizing performance in the most arduous conditions. Vibration sensors at the edges of the disk feed forward to the actuator, warning it of oncoming disruption. In tests this technology improves performance in business and high-end systems by as much as 300%.

IrMnCr read sensor

To address the demand for increased capacity and highly reliable operation of the read sensor, Hitachi scientists developed a material and process for the manufacture of ultra-small read sensors. Use of a new read-head alloy – iridium-manganese-chromium (IrMnCr), incorporating an extremely thin layer of ruthenium in the structure to create a very high “pinning field”, resulted in the storage industry’s most stable and reliable read-sensor technology.

Hitachi GST high-performance drives come loaded with leading-edge functionality, so you know that the right tools are always at hand.

Enhanced Adaptive Battery Life Extender (ABLE)

Hitachi understands the challenges its customers face in maximizing battery life in their products, and engineered the ABLE power management technology in response. ABLE enables the host system to realize the optimum power utilization from the drive, and customize power consumption at drive level to suit the specific application.

Bulk Data Encryption

Several Hitachi hard drives now offer optional Bulk Data Encryption – a hard-drive-level data security mechanism that puts users’ data effectively ‘under lock and key’, offering virtually impenetrable protection. As an alternative to protecting data through software-based encryption or system-level passwords, hard-drive level encryption guarantees better performance and a much higher level of security.

HiVERT™ technology

With the introduction of the Deskstar™ P7K500 drive, Hitachi has increased power efficiency while maintaining 7200 RPM performance. The Deskstar P7K500 provides industry-leading low power consumption by reducing power in both idle and active modes. This results in power savings of up to 40% over previous-generation products. This reduction was achieved by using the same system-on-chip (SoC) that is used in Hitachi’s Travelstar 2.5-inch mobile product line, where low power has long been a key design attribute to maximize battery life in notebook PCs.

This SoC incorporates Hitachi Voltage Efficiency Regulator Technology (HiVERT) in which switching regulators are used in place of less power-efficient linear regulators in the voltage reduction processes.

Hitachi GST Research and Technology

Hitachi Global Storage Technologies was founded on the strengths of two hard disk drive pioneers—IBM and Hitachi. With world-renowned research laboratories, these two companies have driven the vast majority of hard drive development since the introduction of the RAMAC in 1956.

Some of these developments include:

- The first storage unit with removable disks was introduced in 1964, a revolutionary technology that hastened the end of the punched-card era.
- Substantial increases in data storage density, including magneto-resistive (1975) and giant magneto-resistive heads (1997).
- Hitachi introduced 9.5-inch disks in 1988, while the rest of the industry was standardized on 14-inch. The 9.5-inch disk—the world's smallest at the time—featured the industry's best recording density, reliability and lowest power consumption.
- Hitachi achieved substantial increases in data access speed. In 1998 by pioneering the world's highest rotational-speed hard disk drive (i.e. 12,000 RPM using 2.5-inch disks), they enabled industry-leading subsystem performance.
- In 1999, the 340MB Microdrive digital media was introduced. This tiny 1-inch drive offered



1-inch Microdrive 3K8

68 times more capacity than its RAMAC predecessor and ushered in the consumer era when household electronics products that store large amounts of digital data emerged.



1956, RAMAC—The world's first hard disk drive stored 5MB of data on 50 24-inch disks

- In May 2001, IBM introduced “pixie dust,” an industry-leading breakthrough for advancing areal density. The new material—antiferromagnetically-coupled media—had the potential at that time to quadruple the areal density of hard disk drive products to 100 billion bits/sq. in., a density previously thought impossible.
- In May 2003, Hitachi introduced the world's first 7200 RPM 2.5-inch hard drive for notebook PCs, opening the door for desktop-equivalent performance in a mobile computer. GMR heads and “pixie dust” media were the technologies which enabled high capacity (60GB) and performance in a rugged, power-efficient compact design.
- Hitachi, Ltd. first demonstrated perpendicular magnetic recording (PMR) in November 1984. In April 2004, Hitachi GST demonstrated PMR for hard drives at a storage density of 233 gigabits per square inch (GB/in²) and began field testing prototype 2.5-inch PMR drives in December 2004. PMR has enabled 500GB 2.5-inch and 1TB 3.5-inch hard drives.
- In May 2007, Hitachi shattered capacity records by delivering the industry's first terabyte (TB) hard drive based on PMR technology.

Accelerating into the third millennium, there is an insatiable demand for data storage. Consumers want to store more pictures, video, movies and

other high-capacity multimedia content than ever before. Hitachi scientists continue to explore ways to increase areal density, performance and reliability.



Hitachi 1TB hard drive—capacity to store 250,000 songs, 350 movies, 1,000 hours of video, 333,300 photos or 500 games.

Current areas of research at the Hitachi Global Storage

Technologies' research lab include:

- Servo technology
- Mechanics
- Signal processing
- Recording physics
- Interface materials
- Disk technology
- Head-disk interface
- Encryption security
- Patterned magnetic media
- Thermal-assisted recording
- Recording head materials
- Recording head processing
- CPP tunnel valve

24/7 Mission: possible

Unbeatable stability, reliability
and performance for a 24/7 world.



The Ultrastar™ family

The ultimate in performance
and reliability for mission -
critical 24x7 applications

- Size:** 2.5 and 3.5-inch
- Capacities:** 73GB to 2TB
- Speed:** 7200, 10,000
and 15,000 RPM
- Seek times:** As fast as 3.4 to
as fast as a 2.9ms
- Interfaces:** SAS, FC, SATA,
Ultra SCSI

Handle the toughest mission-critical workloads, effortlessly.

24x7 enterprise server environments demand the highest performance storage. The Ultrastar family delivers. Gain up to 2TB of sheer processing power built on proven design for mission-critical workloads: from online transaction processing to intensive data analysis and data warehousing.

See what's possible at www.hitachigst.com

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Ultrastar

Application Highlights

Rest assured your data is being well looked after



Ensures your online transaction processing and data is in safe hands



With average seek times as fast as 3.4ms and average latency of 2ms, enterprise customers can access their data more quickly and efficiently



Rotational Vibration Safeguard (RVS) technology maintains drive performance in multi-drive systems where rotational vibration is likely to occur

With a complete product portfolio, the Hitachi Ultrastar hard drive range has been designed to meet every enterprise requirement. As well as best-of-breed reliability, Ultrastar offers complete flexibility with SCSI, Serial Attached SCSI (SAS), Fibre Channel and Serial ATA (SATA) interfaces and capacities ranging from 73GB to an industry-leading 2TB. And with the SFF HDD and speeds of up to 15,000 RPM, there's only one brand of hard drive any enterprise product will ever need.

Application highlights:

- **Online transaction processing:** Proven reliability and unique Hitachi technologies make the Hitachi Ultrastar the ideal solution for mission-critical enterprise computing environments like online transaction processing, data analysis and other multi-user applications
- **RAID:** Unique Hitachi Rotational Vibration Safeguard (RVS) technology keeps drives performing in multiple drive designs
- **Scientific engineering and data analysis:** 15,000 RPM version drive as much as 33% more in I/Os per second over 10,000 RPM equivalent
- **Media streaming:** High speed and cache levels up to 64MB ensure multi-users are not left waiting
- **Data warehousing**
- **Imaging systems**
- **Storage Area Network (SAN)**
- **Network Attached Storage (NAS)**
- **Fully supported integration:** High-level technical back-up from regional Hitachi Design Studios ensures smooth integration
- **Proven reliability** with a low cost-per-megabyte.
- **Capacities up to 2TB**
- **Small form factor (SFF):** Designed to meet the changing requirements of the data center and optimized for the power and performance requirements of servers

What are small form factor drives?

At 2.5-inch disk diameter, they offer distinct size benefits over traditional 3.5-inch enterprise drives, allowing RAID configurations to be more densely populated, providing high performance while reducing power consumption.

Benefits:

- 178% greater performance than 3.5-inch hard disk drives
- 50% smaller footprint to be configured much more densely in multi-drive systems
- Rotational vibration tolerance, decreasing the risk of failure
- Lower power consumption, helping to reduce costs

Ultrastar

Product Highlights

73GB to 2TB | 7200, 10,000 and 15,000 RPM | Seek times as fast as 3.0ms



Full range of hard drives for enterprise storage

Hitachi offers a full range of products to address the different requirements of the enterprise market:

- The 15,000 RPM Ultrastar 15K600 and Ultrastar C15K147
- 10,000 RPM Ultrastar C10K300 in the small form factor (SSF)
- 7200 RPM Ultrastar A7K2000 and Deskstar E7K1000

Ultrastar drives are built on technology proven for reliability, leveraging the system architecture and electronics of their predecessors. They target a broad range of enterprise storage systems and cycle storage applications to servers, meeting the unique needs of three critical segments of the enterprise storage hierarchy.

Ultrastar's unbeatable stability, reliability and performance has made it the drive of choice for top OEMs worldwide.

Ultrastar 15K600

- **Capacity:** 600GB, 450GB and 300GB
- **Application:** Delivers ultimate performance with high capacity in the same drive.
- Largest 64MB cache buffer in the industry
- 6Gb/s SAS and 4Gb/s FCAL interfaces for configuration flexibility
- Self-encrypting models conform to TCG's Enterprise specification

Ultrastar A7K2000

- **Capacity:** Up to 2TB
- **Application:** Delivering a colossal 2TB of storage to the enterprise with 7200RPM performance and innovative technologies like rotational Vibration Safeguard (RVS) for robust performance in multi-drive environments
- 24x7 enterprise duty cycle
- 3Gb/s SATA for configuration flexibility
- Targeted 1.2 Million hours MTBF

Ultrastar C15K147

- **Capacity:** 147GB and 73GB
- **Application:** 15,000 RPM small form factor drive that is ideal for high performance enterprise applications.
- Largest 64MB cache buffer in the industry
- 6Gb/s SAS moves data quickly and reliably
- Self-encrypting models conform to TCG's Enterprise specification
- 70% less space compared to a standard 3.5inch enterprise class drives for storage efficiency.

Ultrastar C10K300

- **Capacity:** 147GB and 300GB
- **Application:** Save money on your cooling costs. Compared to its 3.5-inch sibling, power consumption is reduced by up to 65%
- Ultra fast 6Gb/s SAS reliable data throughput
- Large 64MB cache buffer manages data efficiently
- Low carbon footprint SAS drive with Advanced Power management technology

Ultrastar

Specification Highlights



Hitachi load/unload ramp

Performance and reliability are key requirements for enterprise-class hard drives. The mature design of the Ultrastar range means greater reliability, helping achieve shorter qualification times.

	Benefits	Ultrastar 15K600	Ultrastar C15K147	Ultrastar C10K300	Ultrastar A7K2000
Capacity¹	Wide range of popular drive capacities up to a massive 1TB	600GB, 450GB, 300GB	147GB, 73GB	300GB, 147GB	2TB, 1TB, 500GB
Performance					
Speed (RPM)	Super fast operation	15,000	15,000	10,000	7200
Data buffer (MB)^{2†}	Super fast read/write response time	64MB	64MB	64MB	32MB
Rotational Vibration Safeguard	Maintains drive performance in high vibration environments and multi-drive systems	■	■	■	■
Average seek time	Faster data access	3.4ms	3.0ms	3.9ms	8.2ms 2TB 8.5ms <2TB
Media transfer rate (max. Mbits/sec)		2383	1869	1669	1621
Interface transfer rate (max. MB/sec)	Faster system boot-up for faster data access	600 (6Gb/s SAS) 400 (4Gb/s FCAL)	600	600	300
Sustained data rate (Mb/sec)		198 to 119	159 to 116	143 to 88	134
Configuration					
Interface	Ease of integration and configuration flexibility	6 Gb/s SAS 4Gb/s FCAL	6 Gb/s SAS	6 Gb/s SAS	3 Gb/s SATA
Load / unload ramp	Minimizes handling damage during integration	■	■	■	■
Fluid Dynamic Bearing spindle motor	High reliability and low acoustics	■	■	■	■
Environmental					
Acoustics Idle (Bels)	Quieter system operation	3.7	2.9	2.9	2.9 2TB 2.4 <2TB

¹One GB is equal to one billion bytes and one TB is equal to 1,000GB when referring to hard drive capacity.

²Accessible capacity may be less. [†]Portion of buffer capacity used for drive firmware.

The next stroke of genius from Hitachi

Deskstar™ 7K2000, a colossal 7200 RPM 2TB hard drive has arrived!



The Deskstar™ 7K2000 hard drive delivers a colossal two terabytes of storage capacity, alongside 7200 RPM, all in a standard 3.5-inch form factor. Now in its fourth-generation, the unique 5-platter design from Hitachi utilizes relaxed bit density as well as the industry's most reliable perpendicular magnetic recording (PMR) technology and continues to set the standard in reliability.

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Deskstar

Application Highlights

Superior drives for home, work and industry



A massive capacity of up to 2TB and SmoothStream™ make the Deskstar ideal for HDTV edit and delivery applications



Deskstar™ 7K1000.C is the 3rd generation of 1TB from Hitachi providing the right mix of performance and power efficiency making it ideal for power-friendly PCs.



Industry-standard Serial ATA for fast data access and easy integration.

Deskstar top-of-the-range drives combine blistering speeds, storage capacities up to a colossal 2TB, and they're quiet as a whisper, too.

An award-winning lineup of 3.5-inch hard drives delivers power-efficient, high-performance storage in a range of capacities.

Sizes: 3.5 inches Capacities: 160GB - 2TB

Speeds: 7200 RPM Interfaces: SATA

Application highlights:

- **Power Efficiency:** The Deskstar 7K1000.C provides customers with industry-leading power consumption by reducing power in both idle and active modes. The result in power saving of up to 18% over previous-generation products
- **Super quiet applications:** Super quiet operation – critical in audio and video playing and editing applications and where a drive is located close to a user
- **Easy integration:** Serial ATA simplifies system integration
- **Proven reliability:** with a low cost per – Gigabyte

The Deskstar 7K2000 and 7K1000.C

The Deskstar product line is targeted at consumer and commercial desktop computers including home-office and gaming applications.

Between the Deskstar 7K2000 and 7K1000.C, there are eight capacity points ranging from 160GB to 2TB. Deskstar products carry a three-year factory warranty and meet design goals of less than one non-recoverable bit error per 10 bits read. The Deskstar line is optimized for per-unit price at a wide variety of specific capacity and watt combinations that help PC manufacturers meet or exceed ENERGY STAR™ 5.0 specifications.

The drive of choice

...to PC gaming

“Because of Hitachi’s high reliability rate, our Talon customers enjoy a more transparent technology experience and are able to spend more time gaming and less time worrying about their hardware.”

Bradd Berdelman, General Manager of Operations at Falcon Northwest

Deskstar 7K2000 & 7K1000.C

Applications

- Consumer and commercial computers
- External storage
- PC gaming
- Video editing arrays

Deskstar

Product Highlights

160GB to 2TB | 7200 RPM | Idle power as low as 3.3W | Serial ATA

What the experts say...

"The Deskstar 7K1000 is a seriously quick drive. The performance is no doubt thanks in part to the 32MB on board data buffer. In fact it's so good we recommend throwing away your Raptors for a couple of these babies. The massive amount of storage space and ultra-quiet performance is the icing on the cake satisfying demands for high powered multimedia machines with ease, not to mention bragging rights. If you're in the market for some big storage, the Deskstar should be your first port of call."

Maxit Magazine, September 2007

Award winning:

The Deskstar range continues to impress magazine editors and reviewers worldwide:

Deskstar E7K1000:

- * **Editor's Choice Award**
X-bit Labs, USA

Deskstar 7K1000B:

- * **2008 PCM Recommend**,
PC Market Magazine, Hong Kong

Deskstar P7K500:

- * **Test Center Recommended**,
CRN.com, USA
- * **Performance Award**,
Computerbild Magazine, Germany

The award-winning Deskstar range offers capacity, speed and reliability to perform under all kinds of conditions from the desktop to media centers, from PCs to enterprise storage.

Deskstar 7K1000.C

- **Capacity:** 1TB to 160GB
- **Application:** 3rd generation 1TB from Hitachi, extends industry's most power-friendly 7200RPM hard drives.
- Up to 18% idle power savings over previous generation products
- HiVERT Technology for best-in-class power management
- Halogen-free design for eco-friendly footprint

Deskstar E7K1000

- **Capacity:** 1TB, 750GB and 500GB
- **Application:** Delivers value to the enterprise with 7200 RPM performance and innovative technologies like Rotational Vibration Safeguard (RVS) for robust performance in multi-drive environments
- 3Gb/s serial ATA for configuration flexibility
- Five-year warranty

Deskstar 7K2000

- **Capacity:** 2TB
- **Application:** This drive delivers a colossal two terabytes of storage capacity
- The Deskstar offer an exceptional blend of capacity and power efficiency
- HiVERT technology for best-in-class power management
- Built on industry's most reliable PMR technology
- Halogen-free design for eco-friendly footprint

Deskstar 7K1000.B

- **Capacity:** 1TB to 160GB
- **Application:** Second-generation hard disk drive for consumers and commercial computing applications including internal and external storage for consumer computers, networked storage servers, extreme gaming machines and video editing arrays
- 3Gb/s serial ATA for configuration flexibility
- Thermal Fly-height Control for improved reliability and performance
- SMART command transport for adaptive correction
- HiVERT™ technology for best-of-breed power consumption

Deskstar

Specification Highlights

Hitachi ticks all the boxes across the Deskstar range, providing award-winning 7200 RPM performance, low-power design to cut system costs and whisper-quiet operation.

Performance-enhancing technologies particular to Hitachi Deskstar drives include:

Power and acoustic management

Hitachi drives can be configured to reduce both audible noise and reduce power demands. Low noise levels are important in audio/video production environments and whenever a system is located near a user. Multiple power modes mean they can be configured for the specific demands of the application—such as nearline storage where the drive may remain idle for extended periods.

HiVERT innovation

Hitachi Voltage Efficiency Regulator Technology (HiVERT) is a power-saving technology that works to significantly reduce power consumption by the hard disk drive without sacrificing the performance characteristics of the base design.

	Benefits	Deskstar 7K2000	Desktop 7K1000.C	Deskstar E7K1000	Deskstar 7K1000.B
Capacity ¹	Wide range of popular drive capacities up to a massive 1TB	2TB	1TB, 750GB, 640GB, 500GB, 320GB, 250GB and 160GB	1TB, 750GB and 500GB	1TB, 750GB, 640GB, 500GB, 320GB, 250GB and 160GB
Performance					
Speed (RPM)	Super fast operation	7200	7200	7200	7200
Data buffer (MB) ^{2,1}	Super fast access to data	32MB	32/32/32/16/16/8MB	32MB	8MB Parallel ATA 16MB Serial ATA
Media transfer rate (max. Mbits/sec)	Faster system boot-up and quicker screen refreshes	1621	1589	1443	1443
Interface transfer rate (max. MB/sec)	Faster system boot-up. 300MB/sec burst rate for faster data access	300: SATA	300: SATA	300: SATA	300: SATA
Configuration					
Interface	Serial ATA II has thinner and longer cabling for easier routing	SATA 3Gb/s	SATA 3Gb/s	SATA 3Gb/s	SATA 3Gb/s
Reliability					
Latching SATA connector	Prevents disconnects due to excessive shock or rotation	■	■	■	■
Load/unload ramp	Protects user data when power is removed	■	■	■	■
Fluid Dynamic Bearing spindle motor	Low acoustics & reliable operation in AV and nearline applications	■	■	■	■
Availability ³ (hrs/days x days/week)		24x7	24x7	24x7	24x7
Environmental					
Idle power (W)		7.5	3.6 (500GB/320GB/250GB/160GB) 4.4 (1TB/750GB/640GB)	4.4 (750GB/500GB) 5.2 (1TB)	2.5 (160GB/250GB/320GB) 4.4 (500GB/640GB/750GB) 5.2 (1TB)
RoHS compliant***	Future proof	■	■	■	■

¹One GB is equal to one billion bytes and one TB is equal to 1,000GB when referring to hard drive capacity. Accessible capacity may be less. ²Portion of buffer capacity used for drive firmware.

³250GB version available with 8MB. ³Intended for low duty cycle, non mission-critical applications in PC, nearline, and consumer electronics environments, which may vary from application to application.***RoHS refers to the European Union Directive 2002/95/EC on the restriction of certain hazardous substances in electrical and electronic equipment.

Proven in its field

Cinemastar™ 7K1000.C, the industry's most power-friendly 7200 RPM hard drive.



Balanced power and performance for desktop computing

The Cinemastar™ 7K1000.C hard drive provides an exceptional blend of power efficiency and performance making it an ideal solution for power-friendly consumer and commercial PCs.

www.hitachigst.com

HITACHI
Inspire the Next

That's entertainment

Case study: 250GB CinemaStar™ hard drive

Lowering the carbon footprint of catching your favorite show



The TVonics DVR-FP250 is one of the first Freeview Playback digital TV recorders on the market.

Offering consumers the chance to watch and record over 40 free digital TV channels for just a one-off payment, Freeview Playback is the latest way to enjoy digital TV. The TVonics DVR-FP250 is simple to use and can be plugged straight into existing analog televisions, as well as state-of-the-art LCD, plasma, projection and digital televisions.

The DVR-FP250 digital TV recorder is suited to a whole range of people – from those living busy, active lifestyles who want to catch up on their favorite TV shows at a convenient time; to others wanting an easy-to-use alternative to old-fashioned VCR machines in the run up to digital switchover.

The new TVonics DVR-FP250 makes recording digital terrestrial television simple. The user just selects the programs they want to record over the week ahead via the on-screen, eight-day TV Guide and presses 'Record'. Programs are then stored internally on the large 125-hour recording capacity 250GB internal Hitachi CinemaStar hard disk drive – so there's no need to search for free tapes or disks. Not only will the DVR-FP250 record the program, it will even adjust the recording time if there's a breaking news item or over-running sports event.

Based in Wales, TVonics designs and manufactures innovative products for the digital television sector, focusing on easy-to-use, energy-efficient solutions for the UK and Europe. One of its latest breakthroughs is a low-energy digital TV recorder with twin-tuner and 250GB internal Hitachi CinemaStar hard disk drive, allowing viewers to record and play back up to 125 hours of digital TV for free.

The green choice

In line with TVonics design ethics, the Freeview Playback DVR-FP250 is one of the most environmentally-friendly digital TV recorders on the market today, using 3.5 times less power in standby mode compared to similar products on the market. Power consumption in standby mode is just 3.5 watts, compared to an industry average of 11 watts. When fully switched on, the DVR-FP250 only uses 14.5 watts compared to an industry average of 28 watts, helping consumers lower their carbon footprint and reducing electricity bills.

The stylish DVR-FP250 looks great in the living room and is housed in a high gloss, 'piano black', recyclable and robust aluminum enclosure to further its green credentials. Its internal 250GB CinemaStar Hitachi hard drive is quiet during use.

Twin Freeview tuners allow for the recording of one channel while watching another, so there's no need for an external Freeview Receiver, or arguments over the remote control. Users can also pause and replay live TV so if the phone rings during the big film or the doorbell goes half-way through a favorite show, one press of the remote freezes the action until the user gets back. And to ensure TV lovers don't miss out on any of the action from their favorite series, they can also record the same program on a daily or weekly basis.



“As consumers move from analog to digital television, they are becoming increasingly aware of the benefits of digital recording and are looking for products that offer high-capacity recording, are quiet and reliable, and don't use much power. We chose the CinemaStar range of hard drives because of their class-leading performance and Hitachi's commitment to remaining at the forefront of consumer-oriented storage solutions.”

Paul Fellows,
Managing Director of TVonics

CinemaStar

Product Highlights

160GB to 1TB | 7200, 5400 RPM & CoolSpin™ Technology | ATA 133 & SATA 3Gb/s | 2.5-inch & 3.5-inch



CinemaStar hard drives are super quiet, with low-power idle to provide superb performance in CE and surveillance video applications. They give manufacturers more energy-efficient options for next-generation slim DVR designs.

Application highlights:

- Designed specifically and optimized to handle the unique demands of the audio-visual market
- Adaptive error recovery allows CinemaStar to smooth over faults that routinely crash lesser hard drives
- Based on the award-winning 3.5-inch Deskstar platform
- Available in one, two and three-disk designs with 160GB, 250GB, 320GB, 500GB and 1TB of storage capacity
- Quiet acoustics and low-power idle for cooler system operation
- Wider operating temperature range to support operation in warm or confined spaces
- Ramp load/unload technology for increased shock protection
- SmoothStream™ technology enabled to support ATA-7 streaming command set
- CoolSpin™ technology optimizes motor speed to provide an ideal balance of performance, power efficiency and quiet operation.

CinemaStar 7K1000.C

- **Capacity:** Up to 1TB
- **Application:** Optimised to record multiple, simultaneous video streams, Hitachi SmoothStream technology supports the ATA-7 streaming command set, and SCT provides time-limited error recovery and thermal monitoring capabilities
- Exceptional blend of audio/visual (AV) features fine tunes the CinemaStar 7K1000.C for digital video storage needs.
- Halogen-free design for eco-friendly footprint
- Digital video surveillance storage for 24x7 operation

CinemaStar 5K1000

- **Capacity:** Up to 1TB
- **Application:** features innovative CoolSpin technology to deliver a new level of power efficiency and quiet operation for digital video applications. Key to CoolSpin technology is an optimization of motor speed to provide an ideal balance of performance, power utilization and acoustics.
- Best-in-class power utilization and heat emission
- Halogen-free design for eco-friendly footprint

CinemaStar 7K1000.B

- **Capacity:** Choose from 1TB to 160GB
- **Application:** CE features set allows for improved handling of high-quality video streams
- Media maintenance helps to prevent track wear out
- Silent seek for ultra-quiet operation
- SMART Command Transport (SCT) for adaptive correction for optimum video delivery

CinemaStar 5K500

- **Capacity:** 500GB
- CoolSpin™ technology
- Silent-seek acoustics
- Smart Command Transport (SCT) adaptive error correction
- Best-in-class power utilization and heat emission
- Targeted 1.2 million hours MTBF

CinemaStar C5K500

- **Capacity:** Up to 500GB
- **Application:** Optimized for video applications for any size system and next-generation slim DVR designs.
- Low-profile (9.5mm) 2.5-inch design
- SmoothStream™ technology
- Silent-seek acoustics for CE applications
- SMART Command Transport (SCT) for streaming optimization
- Best-in-class power utilization to help reduce energy costs
- Eco-friendly 1.4W read and write power with a Halogen-free design

CinemaStar

Specification Highlights

CinemaStar has been designed for quiet acoustics and low-power management, to keep customers happy and energy bills down.



Hitachi load/unload ramp

	Benefits	CinemaStar 7K1000.C	CinemaStar 5K1000	CinemaStar 5K500	CinemaStar C5K500
Capacity¹	Wide range of popular drive capacities up to a massive 1TB	1TB, 750GB, 500GB, 320GB, 250GB, 160GB	1TB, 750GB, 500GB, 320GB, 250GB, 160GB	500GB	160GB, 250GB, 320GB and 500GB
Performance					
Speed (RPM)	Super fast operation	7200	CoolSpin™ Technology	CoolSpin™ Technology	5400
Data buffer (MB)²	Super fast access to data	32 1TB - 750GB 8 500GB - 160GB	8	8MB	8MB
SMART Command Transport (SCT)	optimized response times	■	■	■	■
Media transfer rate (max. Mbits/sec)	Faster system boot-up and quicker screen refreshes	1589	1265	929	875
Interface transfer rate (max. MB/sec)	Faster system boot-up. 300MB/sec burst rate for faster data access	300	300	300	300
Configuration					
Interface	Serial ATA II has thinner and longer cabling for easier routing	3Gb/s SATA	3Gb/s SATA	3Gb/s SATA	3Gb/s SATA
Reliability					
IrMnCr read heads	Better performance and data reliability	■	■	■	■
Load/unload ramp	Protects user data when power is removed	■	■	■	■
Thermal Fly-height Control	Enhanced reliability	■	■	■	■
MTBF (hours)³		1.2 million	1.2 million	1.2 million	
Environmental					
CoolSpin™ motor			■	■	
Acoustics Idle (Bels)	Quieter system operation	2.5 > 500GB 2.7 < 750GB	2.4	2.2	2.4
RoHS compliant**	Future proof	■	■	■	■

¹One GB is equal to one billion bytes and one TB is equal to 1,000GB when referring to hard drive capacity. Accessible capacity may be less.

²Portion of buffer capacity used for drive firmware.

³Intended for use in lower duty cycle AV streaming applications. This MTBF target is based on a sample population and is estimated by statistical measurements and acceleration algorithms under normal operating conditions. MTBF ratings do not predict reliability of an individual drive.

**RoHS refers to the European Union Directive 2002/95/EC on the restriction of certain hazardous substances in electrical and electronic equipment.



Who says you can't take it with you?

If you strive for performance excellence, achieve it with Hitachi.



Award-winning storage from the Travelstar™ family. Performance without compromise.

Size: 2.5 inches
Capacities: 40-500GB

Speed: 5400 to 7200RPM
Interfaces: SATA and PATA
Options: Bulk Data Encryption. Enhanced availability for 24x7 data access.



Introducing an award winning storage line-up that delivers power, efficiency, ruggedness and performance for mobile applications.

With the Hitachi Travelstar hard drive family, you can now run all of the programmes and applications on your laptop, with desktop-like performance. Plus, thanks to their improved operating shock performance, an industry leading 400G, they're also able to withstand life's little knocks. In addition to outstanding capacity, many Travelstar drives also offer top-line security with Bulk Data Encryption technology. So your data will always be for your eyes only.

Enjoy the power to do what you do best, whenever, wherever. www.hitachigst.com

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First-Ever 1TB Notebook PC

Case Study: Hitachi Travelstar™ 2.5-inch

Hitachi HDD being used in 1TB Notebook PC



Hitachi Global Storage Technologies' Travelstar hard disk drive is being used to deliver 1TB laptop.

The Travelstar 5K500 delivers up to half-terabyte of capacity, setting a industry benchmark for mobile hard drive capacities. This breakthrough product addresses a growing demand for high-capacity drives that are at the heart of today's full-featured notebooks, external storage devices, gaming consoles and other mobile devices.

Available in either a 400GB or 500GB model, the Travelstar 5K500 is also

The Travelstar 5K500 includes an array of innovative features such as Hitachi-patented Rotational Vibration Safeguard (RVS) technology which compensates for vibration and shock effects to maintain high performance, and optional Bulk Data Encryption which helps guard against data theft.

offered in an enhanced-availability (EA) version—the Travelstar E5K500—which is designed for applications requiring 24x7 applications such as blade servers, multi-drive systems, point-of-sale terminals, network routers and video surveillance.

Hitachi Partners with ASUS to Deliver the First-Ever 1TB Notebook PC ASUS has integrated the Travelstar 5K500 drive into its M50 and M70 notebook PCs, the latter of which delivers up to 1TB of storage capacity in a two-drive configuration. 1TB of capacity translates to 1,000 hours of video, more than 350 feature-length movies or 250,000 four-minute songs.

"Digital entertainment on-the-go is growing rapidly and notebooks are being used to run more powerful, memory-intensive applications. Our notebooks with the Hitachi Travelstar 5K500 provide the answer to users who demand systems that combine large storage capacities with desktop-class performance and features."

Tony Chen
General Manager
ASUS Notebooks Business



Travelstar 2.5-inch

Application Highlights

The first word in superior mobile drives for home, work and industry



At the heart of the world's best laptops, enabling users to work faster and play longer with the assurance of Hitachi award-winning reliability



With small size and minimal heat emission, the Travelstar offers enhanced availability models designed for 24x7 access in lower transaction environments



Optional Bulk Data Encryption is available on specific Travelstar part numbers for users looking for increased data security

We provide the broadest and fastest range of 2.5-inch hard drives available today, so there is always the right drive to satisfy innovation – from traditional computing to new applications.

Application highlights:

- **Gaming PCs:** Professional and amateur PC gamers benefit from the super fast 7200 RPM (15% faster than 5400 RPM drives)
- **Shockingly good resistance:** Hitachi Travelstar is designed to withstand the knocks of life. Hitachi is the first drive maker to implement the new femto slider: utilized for improved shock resistance, disk storage capacity and reduced power consumption
- **Blade servers, network routers, point-of-sale terminals, telephony applications and Web hosting:** Travelstar enhanced availability models are designed for around-the-clock data access
- **Designed for computing excellence:** Industry-leading capacity and performance in a 2.5-inch hard drive
- **Multimedia and AV:** 8MB or 16MB data buffer and 5400 RPM or 7200 RPM for fast data access and delivery
- **Extended battery life:** Our idle power is the industry's lowest
- **Wide range of popular capacity sizes up to 500GB** and simple, safe connections benefit high volume consumer products

Bulk Data Encryption

Several Hitachi hard drives now offer optional Bulk Data Encryption – a hard drive-level data security mechanism that puts users' data effectively 'under lock and key' offering virtually impenetrable protection.

As an alternative to protecting data through software-based encryption or system-level passwords, hard-drive level encryption guarantees better performance and a much higher level of security.

Some models of our Travelstar products with encryption also conform to the TCG Opal specification.

Travelstar 2.5-inch

Product Highlights

80GB to 500GB | 5400 RPM and 7200 RPM | Serial ATA 1.5 - 3Gb/s



Award winning:

Since 1999, our 2.5-inch drives have won many awards for excellence and innovation from major publications around the world.

Travelstar 7K320:

- * Redline Approved
Treadlayers.com, USA
- * Recommended
Laptop Logic, USA

Travelstar 7K200:

- * Editor's Choice Award
PC Market Magazine, Hong Kong

Travelstar 7K100:

- * Editor's Choice Award
Micro Computer, China
- * Original Design Award
IXBT.com, Russia
- * Best Tested
Computer! Totaal, The Netherlands

Travelstar 5K500:

- * Silver Recommended
QuickPC Magazine, Thailand
- * Silver Award
BuyCOMS, Thailand

The Hitachi Travelstar portfolio includes the first high-performance 7200 RPM drive for notebook computers; the industry's best power efficiency and outstanding non-operating/operating shock values (1000G/400G).

Travelstar 7K500

- **Capacity:** 500GB, 320GB, 250GB, 160GB, 120GB
- **Application:** Designed for high performance storage for notebook PCs with optional data encryption technology, also suitable for Gaming PCs, blade servers, network routers and compact road systems
- Highest operating shock with industry-best protection against bumps and rough handling
- Outstanding application performance in PCMark® Vanatage testing
- Halogen-free for eco-friendly footprint

Travelstar 7K320

- **Capacity:** Multi-award winning drives offer storage capacities of 320GB, 250GB, 160GB, 120GB and 80GB
- **Application:** 7K320 addresses the need for rugged, reliable storage in non-stop environments such as blade servers, network routers, PS terminals, Web hosting and video surveillance. With its higher shock specifications and optional Bulk Data Encryption, 7K320 is designed to meet the needs of the most discriminating notebook users
- Fourth-generation Perpendicular Magnetic Recording (PMR) technology
- Best application performance in PCMark testing
- Lowest 7200 RPM power consumption—22% improvement over previous generation
- Capacity and power parity with 5400 RPM models
- 400G operating shock offers Industry-best protection against bumps and rough handling

Travelstar 5K320

- **Capacity:** 320GB, 250GB, 160GB, 120GB and 80GB
- **Application:** Notebook PCs, external storage, gaming consoles, and small form factor video devices. The enhanced availability models are suitable for blade servers, network routers and video surveillance
- Low power consumption
- Security option: Bulk Data Encryption
- Serial ATA 3Gb/s
- Robust: 1000G non-operating and 400G operating shock specification

Travelstar 5K500.B

- **Capacity:** Up to 500GB of capacity
- **Application:** Notebook PCs, multi-media and entertainment PCs, external storage, slim desktop PCs, advanced mobile applications
- Two-disk configuration with 9.5mm z-height
- Rotational Vibration Safeguard
- Frugal on power consumption
- Serial ATA 3Gb/s
- Security option: Bulk Data Encryption
- Halogen-free for eco-friendly footprint

Travelstar 2.5-inch

Specification Highlights



The versatile Hitachi Travelstar portfolio comes with all the necessary capabilities and performance levels to handle multimedia, digital audio and mobile applications.

	Benefits	Travelstar 7K500	Travelstar 7K320	Travelstar 5K500.B	Travelstar 5K320
Capacity	Wide range of popular drive capacities up to a massive 250GB	500GB, 320GB, 250GB and 160GB	320GB, 250GB, 160GB, 120GB and 80GB	500GB, 400GB, 320GB, 250GB, 160GB and 120GB	320GB, 250GB, 160GB, 120GB and 80GB
Performance					
Speed (RPM)	7200 RPM is the fastest 2.5-inch drive in the industry	7200	7200	5400	5400
Data buffer (MB) ²	Super fast access to data	16MB	16MB	8MB	8MB
Average seek time	Faster data access	12ms	12ms	12ms	12ms
Media transfer rate (max. Mbits/sec)	Faster system boot-up and quicker screen refreshes	1245	1136	875	729
Interface transfer rate (max. MB/sec)	Faster system boot-up and data access	300:SATA	300 SATA and 150 SATA	300 SATA and 150 SATA	300 SATA and 150 SATA
Configuration					
Interface	Choice of high-speed interface connections	SATA 3Gb/s and SATA 1.5Gb/s	SATA 3Gb/s and SATA 1.5Gb/s	SATA 3Gb/s and SATA 1.5Gb/s	SATA 3Gb/s and SATA 1.5Gb/s
Reliability					
Shock protection	Exceptional ruggedness to withstand tougher handling	400G/2ms Operating shock Non-op: 1000G/1ms	400Gs Operating shock 1000Gs	400Gs Operating shock Non-op: 1000Gs	400Gs Operating shock Non-op: 1000Gs
Load/unload ramp	Protects user data when power is removed	■	■	■	■
Adaptive Battery Life Extender™ (ABLE) technology	Unique idle power-management technology minimises power usage and helps preserve battery life	■	■	■	■
Environmental					
Active Idle Power	Power efficiency provides longer battery life	1W	1W	0.8W	0.8W
Acoustics Idle (Bels)	Quieter system operation	2.9	2.5	2.4	2.4

One GB is equal to one billion bytes when referring to hard drive capacity. Accessible capacity may be less.
²Portion of buffer capacity used for drive firmware.

Hitachi advanced disk drive technologies deliver performance, reliability and security across a wide portfolio. Whether for desktops, video recorders, closed circuit TV applications, online transaction processing, PC gaming machines, ATA servers or disk-to-disk backup and recovery, our technology ensures that Hitachi drives meet and exceed the highest expectations.

Hitachi Global Storage Technologies

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One GB is equal to one billion bytes and one TB equals 1,000GB (one trillion bytes) when referring to hard drive capacity. Accessible capacity may be less.

www.hitachigst.com

Support contact details

United States, Canada, North and South America
support_usa@hitachigst.com

Singapore / Asia Pacific
support_ap@hitachigst.com

Europe / Middle East / Africa
support_uk@hitachigst.com

Europa / Mittlerer Osten / Afrika – Deutsch
support_de@hitachigst.com

For a full list of support details please visit
<http://www.hitachigst.com> and follow links to 'support'

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