

IBM Ultrastar 2XP 3.5-Inch 4.5 and 9.1 GB High-Performance Disk Drives

Superior performance and capacity for
advanced storage applications

Highlights

7200 RPM drives with fast average data access times

The Ultrastar 2XP is designed for applications demanding fast access to large amounts of data such as large-scale imaging, graphics and multimedia, as well as high-speed network server and multi-user database applications.

Embedded sector servo technology

Ultrastar 2XP drives use an embedded sector servo implementation, eliminating the need for dedicated servo surfaces and the repetitive thermal calibration routines that can dramatically impact the high-speed data streams required for multimedia and video applications.

S.M.A.R.T. compliance

IBM's drive failure protection, Predictive Failure Analysis(TM) (PFA), ensures a high level of data availability on Ultrastar 2XP drives. Complying with the Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T.) standards, PFA offers an enhanced implementation which monitors key device performance indicators, including head to disk fly height, and reports significant changes or impending failure when predetermined thresholds are exceeded.

Leading drive technology

The Ultrastar 2XP disk drive is optimized for superior performance and capacity, and incorporates the industry's most advanced recording and manufacturing technologies. By combining IBM's leading drive technologies such as MR heads, No-ID(TM) sector formatting and PRDF (PRML with digital filter) channel, the Ultrastar 2XP offers enhanced capacity, performance and reliability, with an areal density of 829 Mbits per square inch. No-ID sector formatting eliminates the overhead caused by the duplicate storage of each data sector's ID field on the disk, and instead uses that space for additional customer data. The unique PRDF data channel produces lower soft error rates and enables higher data throughput.

Performance

The superior performance of the Ultrastar 2XP drives is a result of a combination of several factors. The drives offer a 7200 RPM rotational speed and a data access time under 8.5 ms. Outstanding areal densities, combined with a high-speed channel, provide the Ultrastar 2XP drives with a media data rate of 10.3-15.5 MB/sec. The average sustained data rate of 9.2 MB/sec. is ideal for multimedia and audio visual systems that require higher throughput.

Ultra SCSI implementation

Ultrastar 2XP offers SCSI-3 Fast-20 (Ultra SCSI), which doubles the burst data transfer rate to 20 MB/sec. for narrow SCSI or 40 MB/sec. for Wide SCSI. Fast-20 SCSI minimizes the time any one peripheral controls the SCSI bus. This allows Fast-20 SCSI to offer superior performance over normal SCSI when many devices share the same cable.

UltraStar 2XP drives are available with a variety of SCSI-2 interface models: 50-pin Fast single-ended, 68-pin Fast/Wide single-ended or Differential, and 80-pin single ended. The IBM UltraStar 2XP drives are also available with an advanced Serial Storage Architecture (SSA) interface for more flexible configurations and performance rates that can reach 80 MB/sec. (20 MB/sec. per link, 4 links).

UltraStar 2XP 3.5-inch 4.5 and 9.1 GB Disk Drives

DCHS-34550/-39100 DCHC-34550/-39100

 Configuration

Interface SCSI-2 F&FW/SCSI-3 Fast-20 SSA

Formatted Capacity (512 Bytes) 4550/9100 MB(1)

Number of Disks 5/9

Number of Heads 9/18

Areal Density (Maximum) 829 Mbits/sq.in.

Recording Density (Maximum) 134,500 BPI

Track Density 6160 TPI

Bytes Per Sector 512-740

Disk Type Thin Film

Channel	PRML
Actuator Type	Rotary VCM
Head Type	Magneto-Resistive (MR)
Performance	
Media Data Rate (Banded)	81.6-123.4 Mbits/sec.
Interface Transfer Rate (Maximum)	20.0-40.0 MB/sec.(2) 80.0 MB/sec.(3)
Access Times (Pop. avg.)	
Average read	7.5/8.5 ms
Track-to-track read	0.5 ms
Rotational Speed	7200 RPM
Latency (Average)	4.17 ms
Buffer Size	512 KB(4)
Reliability	
MTBF(5)(Projected power-on hours)	1,000,000
Recoverable Read Errors (QPE enabled)	10 in 10E13 Bits Read
Non-Recoverable Read Errors (Pop. avg.)	10 per 10E15 Bits Read
Seek Errors	10 per 10E8 Seeks

Predictive Failure Analysis/S.M.A.R.T. Yes

Power

Start-up Current (Average) 1.7/2.7 Amps

Idle (Average) 10.4/13.6 Watts

Read/Write (Average) 12.4/16.0 Watts

Power Consumption Efficiency Index .0023/.0015 Watts/MB(6)

Physical Size

Height 25.4/41.3 mm

Width 101.6 mm

Depth 146 mm

Weight 460/850 g

Mounting Industry standard, all orientations

Environmental Characteristics Operating Non Operating

Temperature (degrees) 5 to 55 C -40 to 65 C

Relative Humidity (Non-condensing) 5% to 90% 5% to 95%

Shock (11ms)	10 G	70 G
Vibration	0.5 G	2 G

- (1) 1 MB = 1,000,000 Bytes

- (2) 40 MB/sec represents SCSI-3 Wide

- (3) 40 MB/sec per link, 4 links

- (4) Up to 128 KB used for firmware

- (5) MTBF definition available upon request

- (6) Idle Power Dissipation/Formatted Capacity

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