

Superior performance, reliability, and capacity for advanced enterprise server applications



IBM Ultrastar 9LP and 18XP Hard Disk Drives

Highlights

Superior capacity

Capacities of 9.1 and 18.2 GB and an areal density of 1.2 Gbits/square inch provide superior storage solutions.

High performance at 7200 RPM

Average seek times as low as 6.5 ms and maximum sustained data rates of up to 15.5 MB/sec provide rapid data transfer.

Drive-TIP protection

The IBM Drive-Temperature Indicator Processor (Drive-TIP*) feature automatically monitors disk drive temperature and alerts the SCSI drive controller when the recommended temperature is exceeded.

Robust mechanics

With their new robust mechanical platforms, the Ultrastar* 9LP and 18XP greatly improve non-operating shock performance by up to 85 percent.

Leading drive technology

As members of the IBM Ultrastar family of disk drives, the Ultrastar 9LP and 18XP drives provide reliable, high-performance storage for high-end and PC LAN server systems that must deliver outstanding throughput for demanding database, Internet/intranet, decision support, data mining, and On-Line Transaction Processing (OLTP) applications.

Featuring 9.1 GB (low profile) and 18.2 GB in a 3.5-inch form factor, the Ultrastar 9LP and 18XP provide two of the highest capacities in their class. To provide exceptional performance, these drives combine a

rotational speed of 7200 RPM and fast seek times as low as 6.5 ms with a new IBM custom controller that incorporates command queuing and a large programmable multisegmented 1 MB cache. Hardware automation further reduces SCSI command overhead and cache accessing time.

Leadership reliability

IBM continues its leadership tradition of providing drive failure protection through S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology), IBM Predictive Failure Analysis* (PFA), and the new IBM-exclusive Drive-TIP.

These features monitor key device performance indicators and temperature, reporting significant changes, warnings, or impending failures when predetermined thresholds are exceeded. Ultrastar 9LP and 18XP drives also employ advanced Error Correction Code (ECC) technology throughout the recording process.

Support for advanced applications

Improvements in data throughput are increasingly important in advanced applications, such as video editing, multimedia, and data mining. Ultrastar 9LP and 18XP drives provide the necessary high sustained data rates by combining industry-leading Magnetoresistive Extended (MRX) advanced head technology, an embedded digital servo with efficient No-ID* sector formatting, a powerful ECC "on-the-fly" implementation, and the IBM Likelihood Partial Response Maximum Likelihood (PRML) digital data channel.

Advanced interfaces

IBM offers a comprehensive set of SCSI and serial host interface solutions for the server industry, including Ultra SCSI and Serial Storage Architecture (SSA).



Ultrastar 9LP 3.5-inch 9.1 GB high-performance disk drive



Ultrastar 18XP 3.5-inch 18.2 GB high-performance disk drive

IBM Ultrastar 9LP and 18XP 3.5-inch 9.1 GB and 18.2 GB disk drives

Configuration	DGHS Ultra SCSI	DGHS Ultra2 SCSI	DGHC
Interface	Fast, Fast/Wide, SCA-2	Fast/Wide, SCA-2	SSA
Formatted capacity (512 bytes)	9.1/18.2 GB ¹		
Number of disks	5/10		
Number of heads	10/20		
Areal density (maximum)	1253 Mbits/sq. in.		
Recording density (maximum)	150 KBPI		
Track density	8356 TPI		
Sector size	512 to 732 Bytes		
Channel	PRML		
Encoding method	RLL (16/17)		
Head type	Magnetoresistive Extended (MRX)		
Dedicated landing zone	Yes		
Performance			
Media data rate (banded)	92.2 to 179.2 Mbits/sec		
Interface transfer rate (max)	40 MB/sec ²	80 MB/sec ³	160 MB/sec ⁴
Access times (pop. avg)			
Average read	6.5/7.5 ms		
Track-to-track read	0.7 ms		
Rotational speed	7200 RPM		
Latency (average)	4.17 ms		
Buffer size	1 MB ⁵		
Reliability			
Recoverable read errors	< 10 in 10E13 bits read		
Non-recoverable read errors	< 10 in 10E15 bits read		
S.M.A.R.T./PFA	Yes		
Temperature sensor	Yes		
Power			
Startup current (max)	1.6/2.7 Amps		
Idle (average)	9.2/13.1 Watts		
Read/write (typical)	11.6/15.4 Watts		
Power consumption efficiency index	.0009/.0007 Watts/MB ⁶		
Physical dimensions			
Height	26.0/41.0 mm		
Width	101.85 mm		
Depth	1470 mm		
Weight	570/930 g		
Mounting	Industry standard, all orientations		
Environmental characteristics	Operating	Non-operating	
Temperature	5° to 50° C	-40° to 65° C	
Relative humidity (non-condensing)	5% to 90%	5% to 95%	
Shock	10 G (2, 11 ms)	140 G (2 ms)	
Vibration 0.5 G (RMS)	2.0 G		

¹ MB = 1,000,000 Bytes; 1 GB = 1,000,000,000 Bytes
⁴ 40 MB/sec per link with four links

² 40 MB/sec represents Ultra Fast/Wide ³ 80 MB/sec represents Ultra2 Fast/Wide
⁵ Up to 337 KB used for firmware ⁶ Idle power dissipation/formatted capacity

Contact IBM

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- www.ibm.com/harddrive
- drive@us.ibm.com

IBM TECHFAX document server:

- 408-256-5418 (requires touch-tone phone)
- International callers must call from a fax machine

IBM hard disk drive product information:

- 1 888 IBM-5214 (United States)
- 507-253-4110 (outside of the United States)

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