



HP StorageWorks  
magneto-optical products  
Reliable, high-volume archival storage



# HP StorageWorks magneto-optical jukeboxes allow you to store and share vast amounts of data, safely and affordably — year after year.

HP StorageWorks magneto-optical jukeboxes are a safe, permanent way to archive huge amounts of information and keep it immediately accessible. A high-speed alternative to paper, tape or microfiche-based storage, these industry-standard systems accelerate the way you store, retrieve and use your mission-critical data. With an HP StorageWorks jukebox, your storage system becomes a competitive asset that allows you to improve customer service, reduce back-office costs, provide information for audits, and enhance the way you analyze, share and distribute information.

## Built to scale

HP StorageWorks magneto-optical jukeboxes scale as needed. Choose your storage capacity (from 9.1 GB in the standalone drive to 2.2 TB in the 2200mx model); number of drives per jukebox (from 1 to 10); and number of cartridge slots (from 24 to 238). Order what you need today, and expand your system at any time. Upgrade kits allow you to add drives and cartridge slots — within the same cabinet on some models — so storage capacity can keep pace with your ever-increasing storage and performance requirements. Since all HP StorageWorks jukeboxes are fully compatible, you also have the option of migrating to a larger, next-generation system while leveraging your investment in disks, data, software and training.

## Built to perform

Magneto-optical jukeboxes are ready to work for you. With optical cartridge capacities up to 9.1 GB, true fast-synchronous burst data transfer rates up to 10 MB/second, and sustained transfer rates of up to 6.1 MB/second, these jukeboxes increase capacity by 75 percent over earlier HP optical systems, significantly lowering the cost per gigabyte of storage.

## Built to last

With HP-tested robotics, drive mechanisms and media, HP StorageWorks magneto-optical jukeboxes are rated for up to two million MSBF (mean swaps between failure) with no preventive maintenance required. Some models have hot-swappable drives. If a drive ever fails, it can be replaced on the fly, without bringing the jukebox down.\* And all components, including jukebox, drives and media, are backed by HP hallmark service and support, available around the world to keep you up and running.

## Built for fibre

All large and medium (9.1 and 5.2 GB-based) HP StorageWorks jukeboxes support fibre channel connectivity through the use of HP fibre channel-to-SCSI bridge products. The increased cabling distance (up to 500 meters) provided by fibre channel allows you to physically separate your jukebox from your host server, enabling greater security without introducing the bottleneck of LAN architecture.

## Built for the future

HP StorageWorks magneto-optical jukeboxes protect your investment in key data. The systems will read every generation of industry-standard 5.25-inch magneto-optical media ever sold\* (including 650 MB and 1.3 GB disks), and will both read and write 2.6 GB, 5.2 GB and 9.1 GB disks.

## Built to work

HP StorageWorks magneto-optical jukeboxes are multifunctional — they support both rewritable and write-once-read-many (WORM) magneto-optical disk formats — so one system can meet your short-term and long-term storage needs. Rewritable disks allow a virtually unlimited number of writes, reads and erases with no degradation of disk or data; WORM disks allow just one write operation, and use permanently embedded codes to prevent erasure or overwriting.

\* System/software dependent.

HP StorageWorks optical jukeboxes are more than just a fast, cost effective way to keep data accessible. They're also a competitive advantage for any company whose reputation rests with its ability to share and access information. Call your nearest HP sales office today, and see for yourself why HP is the worldwide leader in magneto-optical storage.

1. With 1.2 TB to 2.2 TB of total storage capacity and fibre channel support, these enterprise-class jukeboxes are the best choice for high-volume integrated document and e-records management applications in industries where long-term, durable and permanent storage are major concerns.

2. These models offer storage capacities of 291 GB to 692 GB, offer fibre channel support, and are perfect for businesses implementing medium-to-large document and image management solutions, e-records management; or businesses that are replacing microfiche, microfilm or paper-based data.

3. With 218 GB total capacity, HP entry-level solution is designed for smaller organizations that need to digitize, archive and quickly retrieve reference data; it can handle the storage and retrieval requirements of most small, paper-intensive businesses for years to come.

4. The 9100mx is the perfect small office/home office desktop accessory for today's storage-hungry environments, where virtually endless amounts of data must be permanently stored.

### 1. HP StorageWorks 2200mx/ 1200mx optical jukeboxes



### 2. HP StorageWorks 700mx/ 600mx/300mx optical jukeboxes



### 3. HP StorageWorks 220mx optical jukebox



### 4. HP StorageWorks 9100mx standalone optical drive



## Technical information

### HP StorageWorks archival storage



HP StorageWorks  
2200mx optical  
jukebox

HP StorageWorks  
1200mx optical  
jukebox

HP StorageWorks  
700mx optical  
jukebox

HP StorageWorks  
600mx optical  
jukebox

HP StorageWorks  
300mx optical  
jukebox

HP StorageWorks  
220mx  
optical jukebox

HP StorageWorks  
9100mx standalone  
optical drive

#### Design characteristics

<b>Capacity(GB)</b>	2165.8	1164.8	691.6	582.4	291.2	218.4	9.1
<b>Slots</b>	238	128	76	64	32	24	1
<b>Drives</b>	4, 6, or 10	4 or 6	2	4	2	1 or 2	1
<b>Avg. disk exchange time*</b>	6.5 s	6.5 s	6.5 s	6.5 s	6.5 s	12 s	N/A
<b>Fibre channel bridge support</b>	yes	yes	yes	yes	yes	no	no

\* The time it takes to stop reading data on a disk, exchange disks, and begin reading data on another disk

#### Drive characteristics

<b>Disk capacity</b>	9.1 GB	9.1 GB	9.1 GB	9.1 GB	9.1 GB	9.1 GB	9.1 GB
<b>Average seek</b>	25 ms	25 ms	25 ms	25 ms	25 ms	25 ms	25 ms
<b>Short seek (across 2.2 MB)</b>	6 ms	6 ms	6 ms	6 ms	6 ms	6 ms	6 ms
<b>Average latency</b>	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms
<b>Rotational speed</b>	3000 rpmr	3000 rpmr	3000 rpmr	3000 rpmr	3000 rpmr	3000 rpmr	3000 rpmr

#### Data transfer rate (software/system dependent)

<b>Reads (max. sustained)</b>	6.1 MB/s	6.1 MB/s	6.1 MB/s	6.1 MB/s	6.1 MB/s	6.1 MB/s	6.1 MB/s
<b>Writes (max. sustained)</b>	3.1 MB/s	3.1 MB/s	3.1 MB/s	3.1 MB/s	3.1 MB/s	3.1 MB/s	3.1 MB/s
<b>Burst (synchronous)</b>	10 MB/s	10 MB/s	10 MB/s	10 MB/s	10 MB/s	10 MB/s	10 MB/s
<b>Burst (asynchronous)</b>	4 MB/s	4 MB/s	4 MB/s	4 MB/s	4 MB/s	4 MB/s	4 MB/s
<b>Read/write error rate</b>	<1 per 10 <sup>14</sup> bytes	<1 per 10 <sup>14</sup> bytes	<1 per 10 <sup>14</sup> bytes	<1 per 10 <sup>14</sup> bytes	<1 per 10 <sup>14</sup> bytes	<1 per 10 <sup>14</sup> bytes	<1 per 10 <sup>14</sup> bytes

#### Disk load/unload time

<b>Load (w/spin-up)</b>	5.5 s (avg)	5.5 s (avg)	5.5 s (avg)	5.5 s (avg)	5.5 s (avg)	5.5 s (avg)	5.5 s (avg)
<b>Unload (w/spin-down)</b>	3.0 s (avg)	3.0 s (avg)	3.0 s (avg)	3.0 s (avg)	3.0 s (avg)	3.0 s (avg)	3.0 s (avg)
<b>Buffer size</b>	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB
<b>Read buffering</b>	Read aheads	Read aheads	Read aheads	Read aheads	Read aheads	Read aheads	Read aheads
<b>Write buffering</b>	Immediate reporting, write re-ordering	Immediate reporting, write re-ordering	Immediate reporting, write re-ordering	Immediate reporting, write re-ordering	Immediate reporting, write re-ordering	Immediate reporting, write re-ordering	Immediate reporting, write re-ordering

Results of 1/3 stroke plus latency over 50 MB bandwidth.

## Technical information continued

### HP StorageWorks archival storage



HP StorageWorks 2200mx optical jukebox	HP StorageWorks 1200mx optical jukebox	HP StorageWorks 700mx optical jukebox	HP StorageWorks 600mx optical jukebox	HP StorageWorks 300mx optical jukebox	HP StorageWorks 220mx optical jukebox	HP StorageWorks 9100mx standalone optical drive
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#### Dimensions

<b>Height</b>	1806.5 mm (71.1 in)	1806.5 mm (71.1 in)	914 mm (36.0 in)	914 mm (36.0 in)	914 mm (36.0 in)	624.7 mm (24.6 in)	100 mm (3.9 in)
<b>Width</b>	875.7 mm (34.5 in)	875.7 mm (34.5 in)	863 mm (33.9 in)	863 mm (33.9 in)	863 mm (33.9 in)	220.1 mm (8.7 in)	165 mm (6.5 in)
<b>Depth</b>	741.8 mm (29.2 in)	741.8 mm (29.2 in)	482 mm (19.0 in)	482 mm (19.0 in)	482 mm (19.0 in)	749.3 mm (29.5 in)	280 mm (11.0 in)
<b>Weight (net)</b>	222.7 kg (490 lbs)	222.7 kg (490 lbs)	100 kg (220 lbs)	100 kg (220 lbs)	100 kg (220 lbs)	39 kg (86 lbs)	3.7 kg (8.2 lbs)
<b>Weight (shipping)</b>	298.0 kg (657 lbs)	298.0 kg (657 lbs)	127 kg (280 lbs)	127 kg (280 lbs)	127 kg (280 lbs)	44.5 kg (98 lbs)	4.4 kg (9.7 lbs)

#### Product certification

<b>Safety</b>	UL 1950, CSA 950, TUV IEC 950	UL 1950, CSA 950, TUV IEC 950	UL 1950, CSA 950, TUV IEC 950	UL 1950, CSA 950, TUV IEC 950	UL 1950, CSA 950, TUV IEC 950	UL 1950, CSA 950, TUV IEC 950	UL 1950, CSA 950, TUV IEC 950
<b>Emissions</b>	FCC Class "A", CISPR 22, Class "A"	FCC Class "A", CISPR 22, Class "A"	FCC Class "A", CISPR 22, Class "A"	FCC Class "A", CISPR 22, Class "A"	FCC Class "A", CISPR 22, Class "A"	FCC Class "A", CISPR 22, Class "A"	FCC Class "B", CISPR 22, Class "B"
<b>Laser</b>	CDRH, IEC 825	CDRH, IEC 825	CDRH, IEC 825	CDRH, IEC 825	CDRH, IEC 825	CDRH, IEC 825	CDRH, IEC 825

#### Reliability and service

<b>MSBF* (robotics)</b>	2,000,000 swaps	2,000,000 swaps	2,000,000 swaps	2,000,000 swaps	2,000,000 swaps	750,000 swaps
<b>MSBF (drive)</b>	750,000 swaps	750,000 swaps	750,000 swaps	750,000 swaps	750,000 swaps	1,000,000 swaps
<b>MTBF** (robotics)</b>	100,000 hours	100,000 hours	100,000 hours	100,000 hours	100,000 hours	100,000 hours
<b>MTBF (drive)</b>	100,000 hours	100,000 hours	100,000 hours	100,000 hours	100,000 hours	100,000 hours
<b>Mean Time to Repair</b>	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes
<b>Preventive maintenance</b>	None required	None required	None required	None required	None required	None required

\* Mean swaps between failure

\*\* Mean time between failure

#### HP 5.25-inch magneto-optical cartridges

HP magneto-optical cartridges are engineered to meet and surpass the most stringent industry standards, resulting in the highest levels of data integrity. Your operating system and software determine the type of cartridges (rewritable/write once) that are supported in your HP system. Product numbers listed below are HP 4096 to 512 bytes/sector optical cartridges. HP StorageWorks jukeboxes support reads and writes on 9.1, 5.2 and 2.6 GB cartridges, and read-only on 1.3 GB and 650 MB cartridges. All cartridges are ISO/IEC 15286-compliant.

	4096 bytes/sector	2048 bytes/sector	1024 bytes/sector	512 bytes/sector
<b>Capacity</b>	9.1 GB (4.5/side)	8.6 GB (4.3/side)	9.1 GB (4.5/side)	9.1 GB (4.5/side)
<b>Single rewritable cartridge</b>	C7983A	C7985A	C7987A	C7988A
<b>Single write-once cartridge</b>	C7984A	C7986A	N/A	N/A

Technical information continued  
HP StorageWorks archival storage



Environmental specifications	2220mx, 1200mx	700mx, 600mx, 300mx	220mx	9100mx
<b>Temperature</b>				
Operating	10° to 32°C	10° to 40°C	10° to 40°C	10° to 40°C
Non-operating*	-40° to 60°C	-40° to 60°C	-40° to 60°C	-40° to 60°C
Gradient	10° C per hour	10° C per hour	10° C per hour	10° C per hour
Transportation (<14 consecutive days)*	-30° to 60°C	-30° to 60°C		
<b>Humidity</b>				
Operating	10% to 80% RH	10% to 80% RH	10% to 80% RH	10% to 80% RH
Non-operating*	5% to 90% RH	5% to 90% RH	5% to 90% RH	5% to 90% RH
<b>Shock</b>				
Non-operating	10 cm tilt, drop test	10 cm tilt, drop test	30 g trapezoidal	30 g trapezoidal
<b>Vibration (5 to 50 Hz)</b>				
Operating	0.21 g rms	0.21 g rms	0.21 g rms	0.3 g rms
Non-operating (random)	2.1 g rms	2.1 g rms	2.09 g rms	2.4 g rms
Non-operating (swept-sine)	0.5 g (0 to peak)	0.5 g (0 to peak)	0.5 g (0 to peak)	1 g (0 to peak)
<b>Acoustic emissions</b>				
Operating			<70 dB	55 dB
Idle			-47 dB	
<b>Power requirements</b>				
Line voltage	100 to 240 VAC	100 to 240 VAC	(115 V) 100 to 127 VAC (230 V) 200 to 240 VAC	100 to 240 VAC
Line frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Power consumption	340 W typical 560 W maximum	210/240 W typical 250/275 W maximum	100 70 W typical 170 100 W maximum	30 W typical 50 W maximum
Energy-saving mode	Power savings when robotics are inactive	Power savings when robotics are inactive	Power savings when robotics are inactive	
<b>Interface</b>				
SCSI-2 LUN converter	Single-ended (HD50) or high-voltage differential (HD68) (user-selectable)	Single-ended (HD50) or high-voltage differential (HD68) (user-selectable)		
SCSI-2 LVD			Single-ended (HD68) or low-voltage differential (HD68) (auto-sensing)	
SCSI-2				Single-ended (HD50)

\* Without media

# A foundation to build on

HP StorageWorks optical jukeboxes — plus your relationship with HP, the industry leader in magneto-optical storage — are the foundation of a solid, long-term storage strategy. To learn how these powerful systems can improve the effectiveness of your organization, call your nearest HP StorageWorks optical storage representative today.

## **HP magneto-optical product information**

HP USA: 1-800-8264111

Canada: (905) 206-4383

France: (1) 69 82 60 60

Germany: 0180/5 32 62 22

UK: 0990 474747

[www.hp.com/go/optical](http://www.hp.com/go/optical)

## **Additional HP information**

### **Phone contacts:**

- HP product information: 1-800-345-1518
- HP Referral Program: 1-888-887-1890
- HP Business Partner sales consulting: 1-800-888-5874
- HP PartnerDirect: 1-800-888-5874

## **Reseller websites:**

- [www.compaq.com/advantage](http://www.compaq.com/advantage)
- [www.compaq.com/referral](http://www.compaq.com/referral)
- [www.compaq.com/resellers](http://www.compaq.com/resellers)
- [www.partnerdirect.compaq.com](http://www.partnerdirect.compaq.com)
- [www.partner.americas.hp.com](http://www.partner.americas.hp.com)

## **Helpful URLs:**

For more detailed information on these and other HP products and services, visit the following sites:

- [www.hp.com](http://www.hp.com)
- [www.hp.com/buy/howtobuy](http://www.hp.com/buy/howtobuy)
- [www.hp.com/products1/storage/index.html](http://www.hp.com/products1/storage/index.html)

[www.hp.com/go/optical](http://www.hp.com/go/optical)

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