

StorageWorks

Solutions from Digital Equipment Corporation

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StorageWorks

Product
Guide

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StorageWorks products are enhanced by software products from several leading vendors. These products include:

Arcadia Backup Exec

Cheyenne ARCserve 5.Old Windows edition NLM (with Netware V3.1x/V4.x) ARCserve is available in different user levels, ranging from 5 to 1000 users.

Corel SCSI Network Manager (with Netware 3.1x)

Legato Networker

Micro Design International SCSI Express (with Netware 3.1x/4.1x)

Palindrome Network Archivist 3.1a NLM single server
Palindrome Network Archivist 3.1a NLM multiserver
Palindrome Autoloader 3.1 software

Palindrome Backup Director 3.1a NLM single server
Palindrome Backup Director 3.1a NLM multiserver

Most distributors and resellers offer the software products listed above. They are not orderable directly from Digital Equipment Corporation.

For more information about software products contact:

Arcada at 407-262-8000
Cheyenne at 516-484-5110-9462
Corel at 613-728-8200
Legato at 415-812-6000
Micro Design International at 407-677-8333
Palindrome at 708-505-3300

For more information!

To learn more about the wide range of StorageWorks solutions, contact your authorized distributor or reseller, or call

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Item	Description	Part #	PCN	SUN	HP	IBM
StorageWorks Adapters/Converters	EISA-SCSI Adapter (includes cable)	FR-PCTAZ-CB	yes	no	no	no
	ISA-SCSI Adapter (includes cable)	FR-PCTAZ-AE	yes	no	no	no
	Sbus-SCSI Adapter Card (includes BN 21H-02 cable)	SWSAP-AB	no	yes	no	no
	Fast Wide SCSI-2 differential to SCSI-2 single ended converter in 3.5" carrier.	SWXA2-AA	yes	yes	yes	yes
	Fast Wide SCSI-2 differential to SCSI-2 single ended converter in tabletop package with power supply.	SWXA2-AT	yes	yes	yes	yes
StorageWorks Power Options	Universal AC Power Supply in 3.5" building block.	SWXBP-SA	yes	yes	yes	yes
	Battery Back-up Unit (2 minutes) in 3.5" building block.	SWXBP-SC	yes	yes	yes	yes
	Add on power distribution unit. Provides redundant AC 120V power for the departmental cabinet.	SWXBP-CA	yes	yes	yes	yes
	Add on power distribution unit. Provides redundant AC 240V power for the departmental cabinet.	SWXBP-CD	yes	yes	yes	yes
	Add on power distribution unit. Provides redundant AC 208V power for the data center cabinet.	SWXBP-DA	yes	yes	yes	yes
	Add on power distribution unit. Provides redundant AC 416V power for the data center cabinet.	SWXBP-DB	yes	yes	yes	yes
Supported Cables/Terminators	SCSI cable, .5 meter SCSI-2, 50 pin high density.	BN21H-0E	yes	yes	yes	yes
	SCSI cable, 1 meter SCSI-2, 50 pin high density.	BN21H-01	yes	yes	yes	yes
	SCSI cable, 1.5 meter SCSI-2, 50 pin high density.	BN21H-1E	yes	yes	yes	yes
	SCSI cable, 2 meter SCSI-2, 50 pin high density.	BN21H-02	yes	yes	yes	yes
	SCSI cable, 6ft SCSI-2, 50 pin high to low density	BC09D-06	yes	yes	yes	yes
	SCSI 68 Pin Terminator Board.	BA35X-MB	yes	yes	yes	yes
	SCSI Jumper Board.	BA35X-MC	yes	yes	yes	yes
	Power Cord: U.S. and Japan.	BN27S-03	yes	yes	yes	yes
	Power Cord: Israel.	BN18L-2E	yes	yes	yes	yes
	Power Cord: Ireland and U.K.	BN19A-2E	yes	yes	yes	yes
	Power Cord: General Europe.	BN19C-2E	yes	yes	yes	yes
	Power Cord: Denmark.	BN19K-2E	yes	yes	yes	yes
	Power Cord: Switzerland.	BN24T-2E	yes	yes	yes	yes
Power Cord: India/Africa.	BN19S-2E	yes	yes	yes	yes	
Power Cord: Italy (Europe only).	BN19M-2E	yes	yes	yes	yes	

StorageWorks Family of Products for Multivendor Platforms

A comprehensive family of disk, tape, and optical storage products, StorageWorks devices and subsystems offer modular, competitively-priced, industry-standard storage solutions. Its modular approach makes it possible to mix and match devices and components in almost unlimited combinations.

Based on today's requirements for open, flexible data storage, StorageWorks products use the widely accepted SCSI-2 (Small Computer System Interface-2) standard. You can configure StorageWorks subsystems for your specific capacity, availability, performance, and cost considerations. Not only is your existing storage investment maintained, you will find the new StorageWorks storage is easy to expand.

StorageWorks Subsystems and components include:

RAID subsystems—which deliver the peace of mind that comes from high availability and high performance. These hardware-based RAID (Redundant Array of Independent Disks) solutions provide reliable, expandable, cost-effective fault-tolerant storage.

Enclosures—A compact desktop expansion enclosure, desktop expansion pedestals, departmental and data center

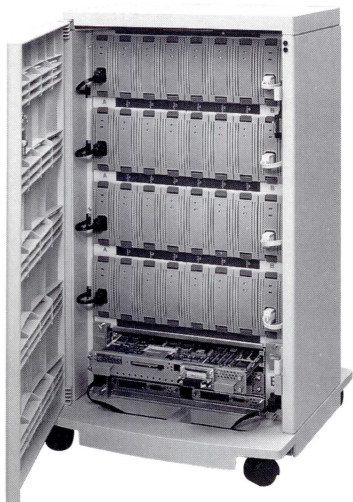
cabinets let you insert hot-swappable devices for the storage capacity and performance you require. Self-contained 19-inch wide shelf units incorporate their own SCSI backplane and cooling, along with supporting elements such as redundant fans and power supplies, and signal converters to form modular storage solutions for any computer environment.

Devices—A full range of industry-leading, high-performance SCSI-based storage devices—magnetic and solid-state disk drives, tape drives, and CDROM drives are in standard form factors that fit into StorageWorks building blocks. These basic building blocks are easily snapped into or out of StorageWorks shelves and enclosures when you want to expand or reconfigure.

StorageWorks subsystems are easy to maintain and service. All major components are replaceable without tools, and can be swapped without powering down the subsystem. And to achieve the highest level of availability, you can use redundant elements to configure subsystems that have no single point of failure. And because StorageWorks comes from Digital, you know you're getting data storage solutions with a proven reputation for quality, reliability, and performance.



2 For UNIX applications that demand high-end performance with unequalled availability, the StorageWorks RAID Array 410 subsystem provides a complete, hardware-based, uniquely affordable solution. The reliability of the StorageWorks RAID Array 410 subsystem comes from its many availability and redundancy features, designed to support your most critical UNIX applications. And of course, you can customize the solution that meets your specific needs.



Highlights

- High-speed performance with RAID or as a disk array
- Supports RAID levels 0 (striping), 3 (striped data with dedicated parity drive), and 5 (striping with distributed parity)
- Highest availability with true hot swap of disks, redundant fans and power supplies, plus automatic failover to hot spares
- Simplified configuration and maintenance with easy-to-use graphical user interface
- Modular architecture enables custom configurations of capacity, performance and availability
- Reliability for lights-out operation with automatic monitoring, failure detection and recovery, and event notification

Item	Description	Part #	PCN	SUN	HP	IBM
StorageWorks CD-ROM	Dual Speed 600MB lowcost CD-ROM drive in a 5.25" building block.	SWXOR-BA	yes	yes	no	no
	Dual speed lowcost 600MB CD-ROM drive for adding as an additional drive.	SWXOR-BB	yes	yes	no	no
	Dual speed lowcost 600MB CD-ROM drive upgrade kit for Desktop Expansion Unit.	SWXOR-BC	yes	yes	no	no
	3 pack of low cost CD-ROM drives in a 5.25" building block.	SWXOR-BD	yes	yes	no	no
	Hi-Performance half height 600MB CD-ROM drive in a 5.25" building block.	SWXOR-CA	yes	yes	yes	yes
	Second CD-ROM drive for SWXOR-CA building block.	SWXOR-CB	yes	yes	yes	yes
	Hi-Performance 600MB CD-ROM drive and upgrade kit for desktop enclosure.	SWXOR-CC	yes	yes	yes	yes

Specifications

	SWXOR-BA/BB	SWXOR-CA/CB		
Read Performance:				
Average Access Time	320 ms	200 ms		
Transfer Rates (KB/s)	150 (1x) 300 (2x) 330(2.2x)	150 (1x) 300 (2x)		
Power Requirements:				
Embedded	+5 @ .66 A	+5@.4A		
Building block				
Physical:	Height (mm/in)	Width (mm/in)	Depth (mm/in)	Weight (kg/lb)
Embedded	25.4/1.0	146/5.75	195/7/68	0.88/1.94
Building Block				

26 Because CD-ROM technology affordably combines high capacity and compact size, CD-ROM drives have become standard equipment on computer systems. Each 4.7-inch CD can hold up to 600 Mbytes of information—the equivalent of 200,000 pages of documentation, 40,000 pages of images, 600 floppy diskettes, or over an hour of digital audio. Emerging multimedia applications that combine text, audio, video, and images place new demands on CD-ROMs.

The StorageWorks CD-ROM drive is the fastest dual-speed CD drive in the industry, and gives the high performance needed in both multi-media or networked applications.

Highlights

- Available in 5.25-inch StorageWorks building block to fit enclosures from the desktop to the data center
- Facilitates quick, easy access to system and application software as well as databases and reference information.
- Multimedia-capable drives support today's emerging applications
- Modular packaging, allows desktop or network placement of CD.
- Industry standard, double speed, multimedia-capable
- Full support for all major industry standards, including CD ROM/XA, Multi session PhotoCD, MPC 1 and 2, CD-DA, and CD-1
- Supports SunOS 4.1.3 and Solaris 2.x operating systems
- Supports Novell NetWare® V3.1x/V4.1x and Windows NT 3.1/3.5
- Supports IBM RS/6000 AIX V.3.2.5
- Supports HP 9000 Series 700 systems with HP-UX 9.05
- Supports HP 9000 Series 800 systems with HP-UX 9.04

PCNetwork
SUN
HP
IBM



Item	Description	Part #	SUN
StorageWorks RAID Array 410 Family	RAID Array 410 Subsystem: Include a StorageWorks RAID 410 Controller with 32MB read and writeback cache, a StorageWorks office expansion enclosure with redundant fans and 5 optimized power supplies. Can be configured with 1 to 24 disk drives (1.05GB or 2.1GB capacity). Configurable with RAID levels 0,3,5 and as a simple disk array. (Requires platform kit.)		
	RAID Array 410-1260 12.6GB (10 usable) Subsystem with six 2.1GB disk drives.	SWXRA-YA	yes
	RAID Array 410-2520 25.2GB (20 usable) Subsystem with twelve 2.1GB disk drives.	SWXRA-YB	yes
	RAID Array 410-5040 50.4GB (40 usable) Subsystem with twenty-four 2.1GB disk drives.	SWXRA-YD	yes
	RAID Array 410 Controller: Six-channel RAID controller with support for up to 42 drives. Includes 32MB read and write-back cache, RAID software license. Can be configured in a variety of StorageWorks expansion enclosures.	SWXRC-04	yes
	Sun Platform Kit for use with RAID Array 410 controller: Includes Graphical User Interface and driver license and media for Solaris 2.2 and 2.3, SBus to FWD Adapter, documentation, and SCSI cable.	SWSK-CA	yes

Specifications

Host interface	Industry standard FWD SCSI-2
Host transfer rate	20 MB per second
Drive interface	Industry standard FSE SCSI-2
Maximum I/O rate	2,600 I/O per second with 1 controller
Operating System Support	SunOS 4.1.3, Solaris 2.2 and 2.3
SCSI Channels per controller	6
Raid Levels Supported	0,3,5
Configurable reconstruct time	Yes
Max. disks per controller	42 (24 drives per office enclosure; scales to variety of StorageWork enclosures)
Mixed drive types	Yes
Max. logical RAID drives per controller	32
Controller Cache	32 MB
Write-back cache	Yes, user selectable
Write-through cache	Yes, user selectable
Redundant fans	Yes
Redundant power supplies	Yes
Battery Backup	Yes (Optional)
Serviceability	Hot-pluggable
Host notified of drive failure	Yes

Physical:	Height (mm/in)	Width (mm/in)	Depth (mm/in)	Weight (kg/lb)
	838.2/33	476.25/18.75	482.6/19	106.65/242 empty

Environmental:	
Operating temperature	10C to 40C
Non-operating temperature	-40C to 66C
Relative Humidity	10% to 80%

Regulatory approvals:	FCC, UL, CSA, TUV and CE-mark
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Electrical rating:	100-120/220-240V ac, 50/60 Hz, single phase, 12/6 amperes
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4 As the use of PC Networks has increased, so has the need for constant data accessibility and reliability to ensure the smooth, efficient running of your business. The StorageWorks RAID Array 210 subsystem is a hardware-based, high availability (fault tolerant) storage array for PC networks, including Novell NetWare and Windows NT. Simply plug the 210 subsystem board into your EISA Intel-based system and connect to its disk array. Providing continuous access to your

critical applications, the RAID

210's flexibility is unmatched.

PCNetwork

Highlights

- True fault tolerance from disks, redundant fans and power supplies, with automatic failover to hot spares
- Automatic failure detection and recovery gives lights-out real-time disaster recovery without operator intervention
- Unsurpassed reliability from automatic monitoring of disk drives for defects and remapping of bad blocks of data
- Superior performance compared to other implementations such as software SCSI-based RAID
- Modular architecture expandable for capacity, performance, and availability
- Use as a disk array and/or with RAID levels 0 (striping), 1 (mirroring), 0+1 (striping plus mirroring), and 5 (striping with distributed parity)
- Competitively priced
- RAID subsystem's meantime between data loss is MILLIONS of years!
- RAID Advisory Board certified



Item	Description	Part #	PCN
Optical Libraries	19.2 GB SCSI-2 Optical library system. Includes one 1.2 GB drive and switchable power supply and accessories. No media (JA). Media (MA).	SWXOW-JA/MA	yes
	38.4 GB Midrange optical library system. Includes two 1.2-GB drives, auto sensing power supply and accessories. No media (JB). Media (MB).	SWXOW-JB/MB	yes
	88 GB data center optical library system. Includes four 1.2 GB drive, auto sensing power supply and accessories. No media.	SWXOW-JC	yes
	172.8 GB data center optical library system Includes four 1.2-GB drives, auto sensing power supply and accessories. No media.	SWXOW-JD	yes

Specifications

Drive Characteristics For All Systems:

Interface	Single-ended SCSI-2; one cable supports the robot and drives	
Media technology	Magneto-optical (130mm/5.25 in)	
Archival life	30 years	

Capacity:	High-Capacity Mode	Low-Capacity Mode
512-byte sectors	1.2 GB (600 MB/side)	594 MB (297 MB/side)
1024-byte sectors	1.3 GB (650 MB/side)	650 MB (325 MB/side)

	ECMA 184	ISO/IEC 10089A
Rewritable Standards (CCS format)	ISO/IEC DIS 13549	ANSI X3.220-1992
Write-once standards (CCW format)	ISO/IEC DIS 13549	ANSI X3.220-1992
Average access time	36.0 ms	31.8ms
Average load time	2.3 with spin-up	2.8 s with spin-up

Data Transfer Rates (max. Sustained):

	SWXOW-JA/MA	SWXOW-JB/MB	SWXOW-JC	SWXOW-JD
Reads	1.6 MB/s	1.6 MB/s	1.0 MB/s	1.0 MB/s
Writes with verification (default)	0.53 MB/s	0.53 MB/s	0.33 MB/s	0.33 MB/s
without verification	0.80 MB/s	0.80 MB/s	0.50 MB/s	0.50 MB/s
Burst sync. asynch.	5.0/3.0 MB/s	5.0/3.0 MB/s	5.0/3.0 MB/s	5.0/3.0 MB/s

Library Characteristics:	SWXOW-JA/MA	SWXOW-JB/MB	SWXOW-JC	SWXOW-JD
SCSI IDs used	2	3	5	5
Average disk exchange time(s)	8	7	8	8
Height (mm/in)	494/19.4	720/28.3	1847/72.7	1847/72.7
Width (mm/in)	220/8.7	375/4.8	651/25.6	651/25.6
Depth (mm/in)	694.27.3	800/31.5	971/38.2	971/38.2
Weight (kg/lb)	35/78	86/189	347/764	360/792
Mechanical reliability (Mean swaps between failures)	300,000	1,200,000	1,200,000	1,200,000

Environmental:

	SWXOW-JA/MA	SWXOW-JB/MB	SWXOW-JC	SWXOW-JD
Operating temperature (C)	5-50	10-40	10-40	10-40
Operating humidity (%RH)	10-90	10-90	10-90	10-90

Power Requirements:

	SWXOW-JA/MA	SWXOW-JB/MB	SWXOW-JC	SWXOW-JD
Voltage (VAC)	110-240	110-240	110-240	110-240
Frequency (Hz)	50/60	50/60	50/60	50/60
Power Consumption (W) (typical/maximum)	70/100	100/250	100/250	100/250

Software Support:

CorelSCSI Network Manager, SCSI Express

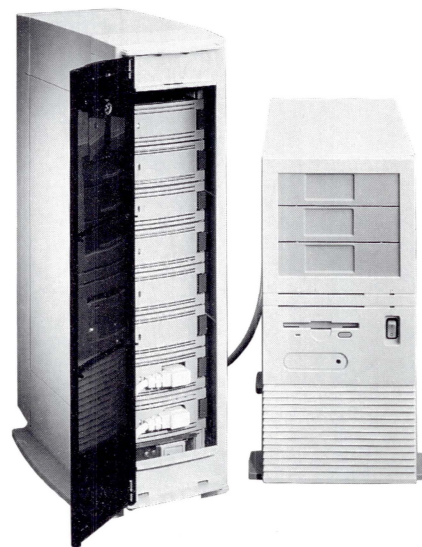
24 StorageWorks optical library systems, also called jukeboxes, provide a low-cost, near online growth alternative for businesses facing increasing storage demands for their PC Networks. These devices provide storage for imaging, archiving, and storage management applications — at a substantially lower cost than online storage. Using a StorageWorks optical solution for long-term data storage to meet regulatory and audit requirements eliminates the added cost of

periodic maintenance and climate-controlled conditions needed by traditional removable magnetic media.

PCNetwork

Highlights

- Supports Novell NetWare V3.1x and V4.0x
- Uses multifunction (WORM and rewritable) drives, and allows mixed media in the jukebox, for great application flexibility
- No preventative maintenance required.
- Offers hardware investment protection through forward and backward media compatibility, drive migration, and jukebox expandability
- Industry standards ensures long-term data readability and lower costs, allowing media interchange and multiple sourcing
- Gets up and running quickly — providing fast investment recovery via ease-of-integration and turnkey application support
- Enables the development of imaging, archiving, hierarchical data management, computer-output to laser disk, and other applications that lower costs and increase efficiency



RAID Array 210 Family

Item	Description	Part #	PCN
StorageWorks RAID Array 210 Family	RAID Array 210-3150 Subsystem: includes a RAID 211 Controller, drivers for Novell NetWare® 3.1x/4.0x and Windows NT 3.1/3.5, RAID software, a deskside expansion enclosure with redundant power supplies and fans, three 1.05 GB disk drives. System is upgradable to three additional disk drives. Configurable for RAID levels 0, 0+1, 1, 5 and as a simple disk array.	SWIRA-BA	yes
	RAID Array 210-6300 Subsystem: Includes a RAID Array 211 Controller, drivers for Novell NetWare® 3.1x/4.0x and Windows NT 3.1/3.5, RAID software, a Deskside Expansion Enclosure with redundant powersupplies and fans, three 2.1 GB disk drives. Configurable for RAID levels 0, 0+1, 1, 5 and as a simple disk array.	SWIRA-BB	yes
	RAID 211 Controller: One-channel EISA backplane RAID controller with 4MB cache. Includes configuration and management utilities, drivers for Novell NetWare® 3.1x/4.0x and Windows NT 3.1/3.5, installation and users guide, and a 2 meter 50 pin high density SCSI cable to connect to an external enclosure. Supports up to 7 SCSI devices.	SWIKX-BA	yes
	RAID 213 Controller: Three-channel EISA backplane RAID controller with 4MB cache. Includes configuration and management utilities, drivers for Novell NetWare® 3.1x/4.0x and Windows NT 3.1/3.5, and all necessary cables for connecting up to three external enclosures. Supports up to 21 SCSI devices.	SWIKX-BB	yes

Item	Description	Part #	PCN	SUN	HP	IBM
StorageWorks Tape Drives and Loaders						
DLT	6 GB DLT tape drive mounted in 5.25" building block.	SWXTL-AA	yes	no	no	no
	10 GB native/20 compressed DLT tape drive mounted in 5.25" building block.	SWXTL-BA	yes	yes	no	no
	10 GB Native/20 compressed DLT tape drive in tabletop enclosure.	SWXTL-BT	yes	yes	no	no
Mini-library	50 GB native/100 GB compressed DLT tape drive in tabletop enclosure.	SWXTL-BL	yes	yes	no	no
DAT	4mm, 4 GB, tape drive in 3.5" building block, 6 per shelf maximum.	SWXTA-AA	yes	yes	**yes	no
	4mm, 8GB, tape drive in 3.5" building block, 6 per shelf maximum.	SWXTA-BA	yes	yes	*yes	no
	4mm, 16 GB tape loader in 5.25" building block, 2 per shelf maximum.	SWXTA-LA	yes	yes	no	no
8 mm	8mm 5 GB native/10 GB compressed Half height helical-scan tape drive in 5.25" building block.	SWXTE-AA	yes	yes	yes	yes
	8mm 5 GB native/10 GB compressed. Half height helical-scan tape drive mounted in building block for adding as a second drive into a SWXTE-AB.	SWXTE-AB	yes	yes	yes	yes
	8mm GB native/10GB compressed half-height helical-scan tape and kit for mounting in desktop enclosure.	SWXTE-AC	yes	yes	yes	yes

Specifications

Power Requirements:	100-240 VAC 50/60 Hz 94 W input/78 W maximum output
Environmental:	Operating temperature 10C to 35C Non-operating -40C to 66C Relative humidity 10% to 80%

Regulatory Approvals : FCC-A, UL, CSA, TÜV, VDE

Physical:

Tape devices fit into 3.5-inch or 5.25-inch StorageWorks building blocks.

	Height (mm/in)	Width (mm/in)	Depth (mm/in)
Tabletop mini-library	406/16	304/12	273/10.8
Tabletop tape drive	145/5.7	235/9.5	332/13.1

* Series 700 only

** Series 800 only

22 The StorageWorks tape family offers capacity, performance, and price alternatives for backing up data that resides on your systems. Available in modular carriers, these award-winning tape devices fit into a variety of storage enclosures. The formats include: Digital Linear Tape (DLT) for fast, reliable, high-capacity unattended backup; 4mm Digital Audio Tape (DAT) for low-cost, reliable backup on small to medium systems ; and 8mm tape from EXABYTE®, commonly used

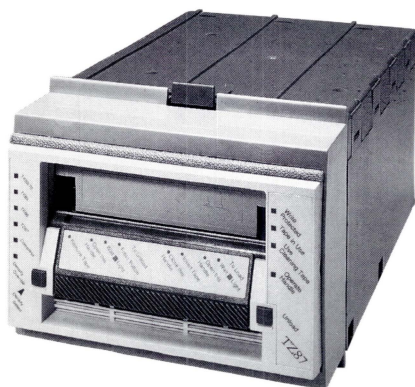
on small to medium local area net

works for data back up and interchange.

PCNetwork
SUN
HP
IBM

Highlights

- Wide choice of tape drives including 4mm DAT, 8mm DLT, and loaders
- Variety of performance, capacity and price enables you to match your specific backup requirements
- Tested and approved for Novell NetWare® V3.1x/V4.1x and Windows NT 3.1/3.5
- Supports SunOS 4.1.3 and Solaris 2.x operating systems
- Supported on IBM AI 3.25 and HP-UX 9.04 and 9.05
- Front-opening carriers allow easy removal of tape media



Specifications

System bus interface	Industry standard EISA
Controller form factor	RAID 211 controller requires 1 slot RAID 213 controller requires 2 slots
Number of logical RAID drives	8 maximum
Number of disks supported	Up to 7 per channel
Drive groups supported	8 maximum
Number of logical RAID drives	8 maximum
Mixed drive types:	Yes
Mixed RAID levels w/in drive group	Yes
Configurable reconstruct time:	Yes (operating system dependent)
Stripe size	8 KB
Controller cache	4-32 MB
Write through cache	Yes, user selectable (default)
Maximum transfer rate	14 MB per second
Maximum I/O rate	2,000 I/O per second
Write back cache	Yes, user selectable (optional)
Boot capability	Bootable from logical RAID drive (requires system console support)
Redundant fans	Yes
Redundant power supplies	Yes
Number of controllers per system	2 maximum
Host notified in case of drive failure	Yes

Physical:

Enclosure:	Height (mm/in)	Width (mm/in)	Depth (mm/in)	Weight (kg/lb)
Single shelf	565/22.2	209/8.2	432/17.0	15.9/35

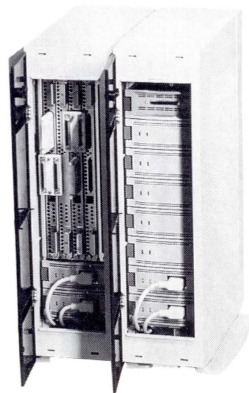
Environmental:

Operating temperature	10°C to 40°C (desktop expansion unit to 35°C)
Non-operating temperature	-40°C to 66°C
Relative humidity	10% to 80%

Regulatory approvals: FCC-B, UL, CSA, VDE, TÜV

8 With critical business applications, you can't afford even a minute of downtime. That's why the StorageWorks RAID Array 110 subsystem for PC Networks and Sun systems was designed to offer all the benefits of RAID — high availability, performance, and affordability. Preconfigured for RAID 5, the RAID Array 110 stores parity information on a redundant disk drive. Should any data drive in the array fail, data can be reconstructed from the parity information on the redundant drive. With the subsystem's hot-plug feature, if a drive, power supply, or cooling unit fails, you can swap in a replacement component — without interrupting your application.

the redundant drive. With the subsystem's hot-plug feature, if a drive, power supply, or cooling unit fails, you can swap in a replacement component — without interrupting your application.



Highlights

- Cost-effective, reliable, fault-tolerant data storage
- Custom scalable from 5-60 GB capacity
- Easy to install, use, maintain, expand, and upgrade
- Supported on Intel 386, 486 and Pentium EISA bus systems
- Supports SunOS 4.1.3 and Solaris 2.x operating systems
- Supports NetWare V3.11; 3.12 SCO UNIX®, and MS-DOS
- Expandable to up to 30 devices
- Pre-configured RAID 5 subsystem; software-selectable for RAID levels 0, 1 and 0+1
- Hot-pluggable disks, power supplies, and cooling units
- Industry-standard SCSI-2 interfaces and 3.5" SCSI disk drives
- Convenient pedestal deskside subsystem



Item	Description	Part #	SUN
StorageWorks Solid State Drives	107MB Solid State SCSI drives in 5.25" building block	SWSE5-RA	yes
	428MB Solid State SCSI drives in 5.25" building block	SWSE5-RB	yes

Specifications

Form factor	5.25-inch building block		
Interface	Fast single-ended SCSI-2		
Access time	<1ms		
Maximum I/O requests	>800 (varies by adapter and workload)		

Environmental:

Operating temperature	10 degreesC to 40 C		
Relative Humidity	10% to 90% non-condensing		

Regulatory approvals:

FCC-A, UL, CSA, TUV

Physical:

Mounted in 5.25 StorageWorks building blocks. Building -block dimensions are:

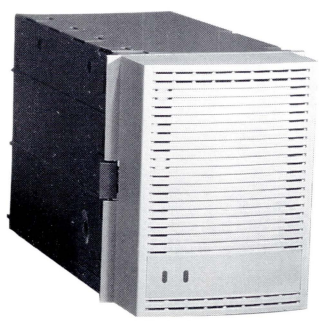
Height (mm/in)	Width (mm/in)	Depth (mm/in)
121/4.8	152/6.0	267/10.5

20 As you downsize to client/server configurations, maintain your data center performance with StorageWorks solid state disks. StorageWorks solid state disks provide lightning fast and consistent sub-millisecond access to data — up to 100 times faster than magnetic disk. And since solid state disks appear as traditional disk drives to the operating system and applications, performance benefits immediately ; no system or operational changes are required.

StorageWorks solid state disks bridge the growing performance gap between today's more powerful computers and a traditional subsystem's ability to supply data to them. Using DRAMS (Dynamic Random Access Memory) chips instead of rotating media, solid state disks eliminate the latency associated with magnetic disk drives, enabling systems to deliver maximum application performance.

Highlights

- Available in 107MB and 428MB capacities
- Incorporates the most advanced and patented error correction code
- Unique integrated data retention system with continuous backup for the highest on line and off line availability
- On-board batteries protect against brief power outages
- Supported on SunOS 4.1.3 and Solaris 2.x operating systems



Item	Description	Part #	PCN	SUN
StorageWorks RAID Array 110 Subsystems	RAID subsystem: Includes five 1.05 GB SCSI disk drives, RAID 110 controller, packaging, two power supplies, 68 to 50 pin host SCSI cable.	SWXRA-XC	yes	yes
	RAID subsystem: Includes five 2 GB SCSI disk drives, RAID 110 controller, packaging, two power supplies, 68 to 50 pin host SCSI cable.	SWXRA-XB	yes	yes
	Drive-ready RAID subsystem: Includes RAID 110 controller, packaging, two power supplies, 68 to 50 pin host SCSI cable.	SWXRA-01	yes	yes
	Two drive-ready storage shelves for RAID expansion. Includes AC power supply.	SWXSE-01	yes	yes
	RAID-Intel (TM), Novell Platform Kit: includes drivers for Novell NetWare 3.x, RAID utility software license, media and documentation. EISA to SCSI adapter, 68 to 50 pin Y cable, 68 to 68 pin host SCSI Cable.	SWIKN-AA	yes	no
	SunOS 4.1.3 and Solaris 2.x Platform Kit: includes GUI, device drivers, RAID utility software license, media, and documentation, Sbus to SCSI adapter, 68 to 50 pin Y cable, 68 to 68 pin host SCSI cable.	SWSK-AA	no	yes
	RAID Array 110 module for mounting in SWXSS-01 RAID Shelf.	SWXCR-01	yes	yes

Specifications	NOVELL	SUN		
Host Interface	FWD SCSI-2	FD SCSI-2		
Host Transfer Rate	20 MB/sec	10 MB/sec		
Drive Interface	Single-ended, 8-bit SCSI-2			
Number of Drive Interfaces	5			
Max. drives/controller	30			
Supported RAID Levels	0, 1, 0+1, 5			
Number of Power Supplies	2 (3 for full redundancy)			
MTBF	250,000 hours			
Serviceability	Hot-pluggable			
Power Requirements:	Voltage	120/240 VAC		
	Frequency	50-60 hz		
	Power Supply Rating	131 watts		
Physical:	Height (mm/in)	Width (mm/in)	Depth (mm/in)	Weight (kg/lb)
	610/24.0	356/14	381/15.0	28/62
Environmental:	Operating Temperature			
	10C to 40 C			
	Non-operating			
	-40C to 66C			
	Relative Humidity			
	10% to 80%			
Regulatory Approvals:	FCC-B, UL, CSA, VDE, TÜV			

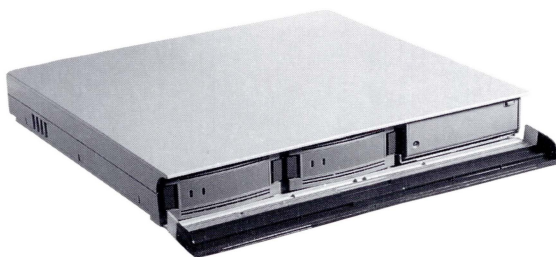
Desktop Expansion Enclosure

10 The desktop expansion enclosure brings the advantages of StorageWorks building blocks to your workstations and PCs. These low-profile 60mm expansion boxes fit above or below a system box — with minimal effect on the height and tilt of the monitor. For storage expansion, the StorageWorks desktop unit provides three empty slots ready to accept up to three 3.5-inch devices or two 3.5-inch devices and one 5.25-inch half-height device — in any combination.

PCNetwork
SUN
HP
IBM

Highlights

- Enables PCs and UNIX workstations to use the same building blocks you configure on larger systems
- Supports SUN, RS/6000, HP 9000 Series 700 and 800 workstations and servers
- Supports Sun Sparc, IBM RS/6000, and HP 9000 Series 700 and 800 workstations and servers
- Supports PCs and PC servers
- Modular design lets you expand or reconfigure storage choice and flexibility
- Fits below system monitor. Takes up no additional footprint on the desktop



Item	Description	Part #	PCN	SUN	HP	IBM
StorageWorks Disk Drives	1.05 GB SCSI disk mounted in 3.5" building block.	SWXD3-SC	yes	for RAID 110	yes	yes
	1.05 GB SCSI disk mounted in 3.5" building block. Formatted for Sun Systems.	SWSD3-SC	no	yes	no	no
	5 Pack of 1.05 GB SWXD3-SC drives.	SWXDB-5C	yes	for RAID 110	no	no
	2.1 GB SCSI disk mounted in 3.5" building block. Formatted for Sun Systems.	SWXD3-SB	yes	for RAID 110	yes	yes
	2.1 GB SCSI disk mounted in 3.5" building block.	SWSD3-SB	no	yes	no	no
	5 Pack of 2.1 GB SWXD3-SB drives.	SWXDB-5B	yes	for RAID 110	no	no

Specifications

	SWXD3-SC	SWXD3-SB
Form Factor	3.5-in	3.5-in
Maximum per/shelf	7	7
Capacity (GB)	1.05	2.10
Average Access Time (ms)	15.1	<15.6
Average Seek Time (ms)	9.5	9.5
RPM	5400	5400
Media Transfer Rate (MB/s)	2.6	2.7-5.5
MTBF	500,000	500,000

Physical:

Carrier-mounted 3.5-inch devices are StorageWorks building blocks. Building-block/carrier dimensions are:

Height (mm/in)	Width (mm/in)	Depth (mm/in)
121/4.8	51/2.0	216/8.5

Environmental:

Operating Environment (C)	5-50	5-55
Relative Humidity	8-80%	10-90%

Regulatory Approvals: FCC-B, UL, CSA, VDE, TÜV

18 StorageWorks 1.05 and 2.10 GB SCSI disk drives satisfy broad applications and environments. These

StorageWorks drives offer features that are unique in SCSI disk products — including unparalleled reliability,

data integrity, performance, compatibility, and

quality assurance. Available in 3.5-inch modular

building blocks, these disk drives fit into all the

StorageWorks enclosures, from desktop to datacenter.

Backed by a 5-year warranty, the StorageWorks SCSI

disk drives ensure reliability by

undergoing thorough testing to

industry SCSI standards for both

signal integrity and command

conformance. And to meet the

requirements of an office environ-

ment, they are built to stringent

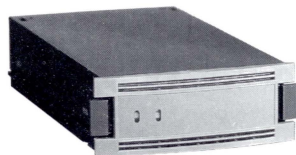
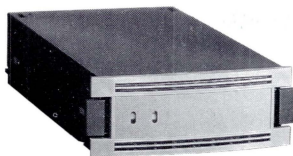
shock, vibration, and temperature

specifications.

Highlights

- Backed by a 5-year warranty
- Tested and approved for Novell NetWare V3.1x/V4.x and Windows NT 3.1/3.5
- Supports SunOS 4.1.3 and Solaris 2.x operating systems
- Supports IBM RS/6000 AIX V.3.2.5
- Supports HP 9000 Series 700 systems w/ HP-UX V.9.05
- Supports HP 9000 Series 800 systems w/ HP-UX V.9.04
- Ensures data integrity with 264-bit error correction code
- Ensures proper identification and transfer of correct data with quadruplicate headers
- 500,000 hour MTBF
- Completes writes-in-progress in the event of a power failure or bus reset with atomic write
- Provides extended operating temperature specification for higher reliability in the desktop environment

PCNetwork
SUN
HP
IBM



Item	Description	Part #	PCN	SUN	HP	IBM
Desktop Expansion Enclosure	Supports 3" x 3.5" devices or 2" x 3.5" and 1" x 5.25" half height device.	SWXSE-03	yes	yes	yes	yes

Specifications

Supported devices: All 3.5-inch disk and tape building blocks, pre-installed CD-ROM drive, 8mm half height drives

Power Requirements:

100-240 VAC 50/60 Hz
94 W input/78 W maximum output

Physical:	Height (mm/in)	Width (mm/in)	Depth (mm/in)	Weight (kg/lb)
	60/2.4	432/17.0	400/15.8	

Environmental:

Operating temperature: 10C to 35C
Non-operating: -40C to 66C
Relative humidity: 10% to 80%

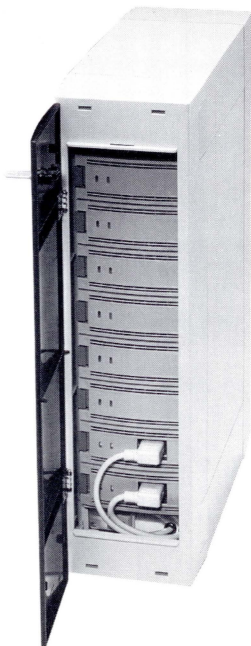
Regulatory Approvals:

FCC-A, CE-mark, UL, CSA, TÜV

Deskside Expansion

- 12 StorageWorks deskside expansion offers a wide choice of ways to develop data storage resources for PC Networks and UNIX systems. The deskside expansion enclosure holds a building-block shelf installed in a pedestal that includes a power supply, redundant fans, front and back doors, and feet. The single pedestal holds up to seven 3.5-inch or two 5.25-inch and one 3.5-inch devices, and can be configured with redundant power supplies.**

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HP
IBM



It's the ideal modular storage for file servers that support workgroups or workstations that require a large amount of local data. For future growth, you can add additional pedestals or remove the shelf from the pedestal kit, attach brackets, and mount it in a cabinet.

Highlights

- Modular design lets you expand or reconfigure storage with unprecedented choice and flexibility
- Hot swap for easy maintenance
- Higher availability with optional redundant power supplies and battery backup
- Supports Sun Sparc, IBM RS/6000, HP 9000 Series 700 and 800 workstations and servers
- Supports PCs and PC servers

Item	Description	Part #	PCN	SUN	HP	IBM
StorageWorks Data center enclosure	24 shelf data center cabinet 208V/416V: Includes one power distribution unit for supporting up to 24 SWXSS-02 shelves and ac power cords with each shelf.	SWXSC-DA/ DB	yes	yes	yes	yes
	RAID Array 110 empty shelf for mounting in data center cabinet. Includes power supply and mounting bracket.	SWXSS-01	yes	yes	no	no
	Second power distribution unit. Provides redundant AC 208V/416V power for the data center cabinet.	SWXBP-DA/DB	yes	yes	yes	yes
	Second power distribution unit. Provides redundant AC 120V/240V power for the department cabinets.	SWXBP-CA/CD	yes	yes	yes	yes

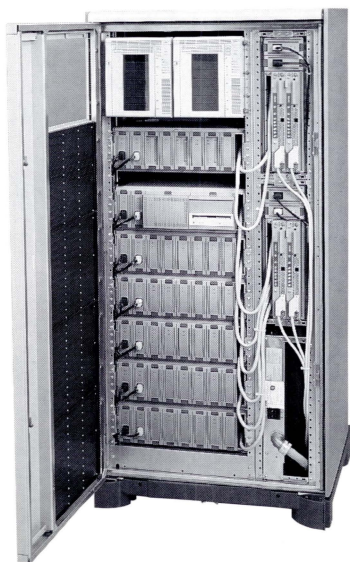
Specifications

Supported building blocks	Disk drives, tape drives, CD ROM drives, and tape magazine subsystems				
Additional subsystems	Half-rack (front and back) 7-cartridge magazine subsystem or full rack (front) 5-cartridge mini-library DLT (Digital Linear Tape) Subsystems				
Maximum shelves	24				
Power requirements:	100-240 VAC 50/60 Hz 3.14 KW per cabinet maximum One or two power distribution units (three-phase)				
Physical:	Height (mm/in) 1700/66.6	Width (mm/in) 800/31.5	Depth (mm/in) 875/34.4	Weight (kg/lb) 454/1000	
Environmental:	Operating temperature Non-operating Relative humidity		10°C to 40°C 40°C to 66°C 10% to 80%		
Regulatory Approvals:	FCC-A, UL, CSA, VDE, TÜV				

Datacenter Enclosure

16 Datacenter cabinets hold building-block and controller shelves plus tape backup subsystems to provide complete storage solutions. Its modular design lets you expand or reconfigure storage with unprecedented choice and flexibility. Up to four DLT subsystems can be installed in the datacenter cabinet to support centralized backup operations.

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SUN
HP
IBM



Every datacenter cabinet is equipped with one power distribution unit. You can add a second power distribution unit, which provides a second full set of AC connections. This enables every shelf to have isolated power input to dual power supplies. Completely redundant power options make StorageWorks shelves in datacenter cabinets an ideal foundation for subsystems that support your largest or most critical business applications.

Highlights

- Largest of the StorageWorks cabinets. Supports 330+GBs of storage
- Operates in both office and data-center environments
- Supports same shelves and building blocks that are used in smaller enclosures
- Redundant power distribution is available so the cabinet can access 2 separate power sources

Item	Description	Part #	PCN	SUN	HP	IBM
Deskside Expansion	Deskside expansion pedestal holds one shelf with up to seven 3.5" or two 5.25" building blocks or combinations of both. Includes AC power supply and second power cord. Front-locking door, Redundant cooling fans.	SWXSE-02	yes	yes	yes	yes

Specifications

Building-block form factors	3.5-inch, 5.25-inch
Supported building blocks	Disk drives, tape drives, tape magazine subsystems, CD-ROMS, solid state drives
Maximum building blocks/shelf	Seven 3.5-inch or Two 5.25-inch with one 3.5-inch or One 5.25-inch with four 3.5-inch

Power Requirements:

100-240 VAC 50/60 Hz
164 W input/131 W maximum output

Physical:	Height (mm/in)	Width (mm/in)	Depth (mm/in)
Single shelf	565/22.2	209/8.2	432/17.0
Double shelf	565/22.2	356/14.0	432/17.0

Environmental:

Operating temperature 10C to 40C
Non-operating -40C to 66 C
Relative humidity 10% to 80%

Regulatory Approvals: FCC-B, UL, CSA, VDE, TUV

Shelf/Pedestal Options:

2nd power supply in building block
FW differential SCSI to SCSI-2 converter in building block
Battery back-up unit in building block
Replacement cooling fan

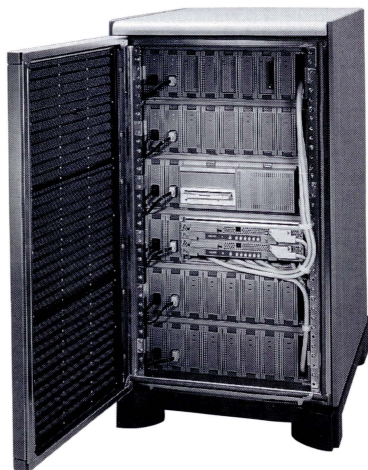
Departmental Enclosure

14 The departmental cabinet is a 43 inch high enclosure that can hold up to 10 StorageWorks shelves. Using single phase power, it enables you to place considerable storage in an office or datacenter environment. You can install up to six shelves in front and four in back of this cabinet. The cabinet supports a wide variety of magnetic disk drives, optical drives, controllers, and tape subsystems.

PCNetwork
SUN
HP
IBM

Highlights

- Operates in both office and data-center environments
- Modular design lets you expand or reconfigure storage with great flexibility
- Shelves are removable and reconfigurable. A single shelf can be removed and used in desk-side pedestal
- Cabinet supports a full array of devices and StorageWorks controllers
- Each shelf can be configured with redundant power supplies for added availability
- Redundant power distribution is available so the cabinet can access 2 separate power sources
- Holds up to 10 shelves—over 140GBs of storage



Item	Description	Part #	PCN	SUN	HP	IBM
Departmental Enclosure	10 Shelf department cabinet for 120/240V: Includes one power distribution unit for supporting up to 10 SWXSS-02 shelves and 10 ac power cords.	SWXSC-CA /CB	yes	yes	yes	yes
	Shelf for mounting in departmental cabinets.	SWXSS-02	yes	yes	yes	yes
	RAID Array 110 empty shelf for mounting in departmental cabinet. Includes power supply and mounting bracket.	SWXSS-01	yes	yes	no	no
	Second power distribution unit. Provides redundant AC 120V/240V power for the department cabinets.	SWXBP-CA/CD	yes	yes	yes	yes

Specifications

Supported building blocks	Disk drives, Tape drives, and CDROM drives Tape loaders				
Additional subsystems	Up to 2 half-rack or up to 2 full rack DLT (Digital Linear Tape) Subsystems				
Maximum shelves	10				
Power requirements:					
Departmental cabinet	100-240 VAC 50/60 Hz 1.3 KW per cabinet maximum One or two power distribution units (single-phase)				
Physical:	Height (mm/in)	Width (mm/in)	Depth (mm/in)	Weight (kg/lb)	
	1100/43.1	600/23.5	875/34.4	140/309 empty	
Environmental:	Operating temperature		10°C to 40°C		
	Non-operating		40°C to 66°C		
	Relative humidity		10% to 80%		

Regulatory approvals: FCC-A, CE-MARK, UL, CSA, TÜV