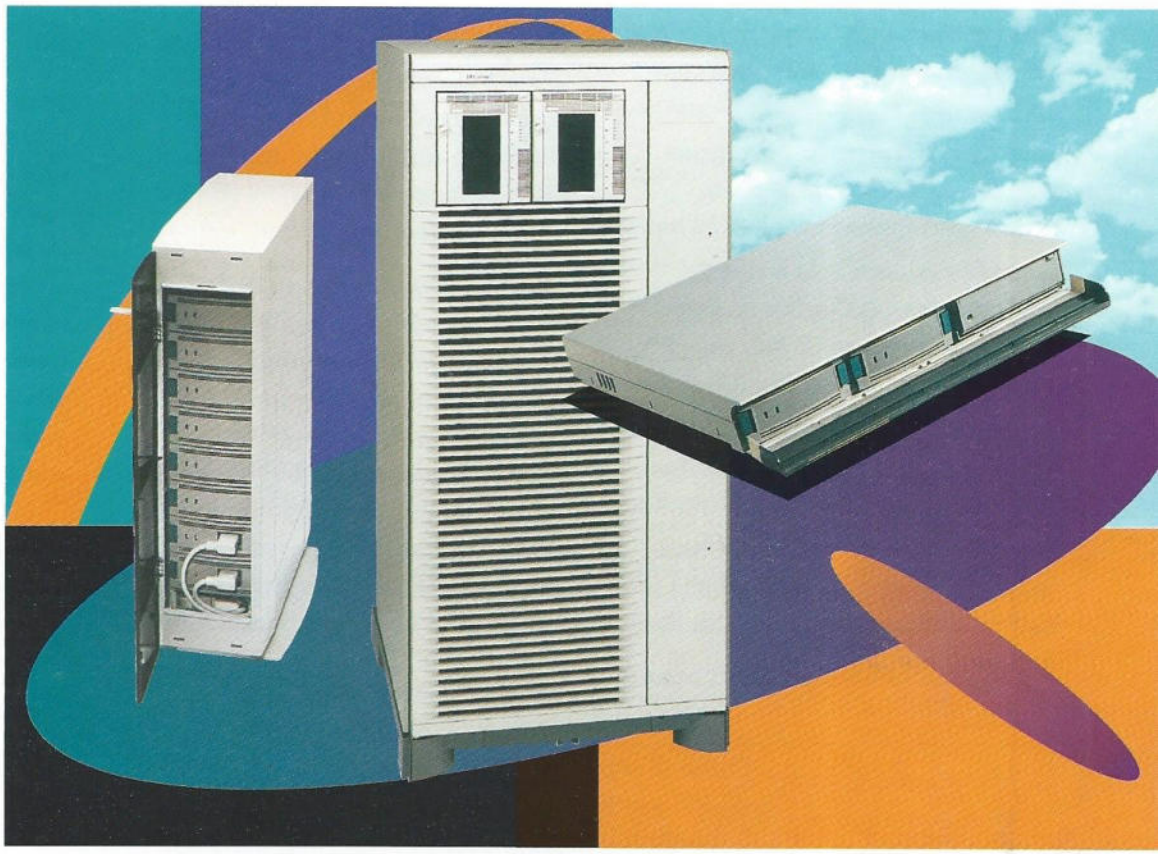
digital™

StorageWorks

STORAGEWORKS COMPONENTS AND ENCLOSURES

Comprehensive, Flexible, Upgradeable Storage Solutions



Now you can create the storage solutions you need today with the flexibility to make changes tomorrow. That's the breakthrough of Digital's StorageWorks family. Whether future needs have you reusing equipment you've already acquired or adding new components, Digital's modular StorageWorks approach protects your initial storage investment and gives you unprecedented choice in the way you develop your data storage resources.

All-modular architecture

Industry-standard storage

Quick swap for easy maintenance

Maximum investment protection

Each element of the StorageWorks family is modular. Storage devices, intelligent controllers, signal converters, packaging, – even power supplies and battery backup units – are all swappable components. Here's how they combine in the industry's most adaptable architecture.

HIGHLIGHTS

All-modular design lets you expand or reconfigure storage with unprecedented choice and flexibility

Industry-standard disk, tape, and optical devices in carriers become building blocks you can swap among many platforms

Building-block shelves support multiple building blocks either in cabinets or at deskside when enclosed in a pedestal kit

Controller shelves support electronics providing enhanced capabilities to devices operating on multiple SCSI buses

Datacenter cabinets hold building-block and controller shelves plus tape backup subsystems to provide complete storage solutions

Desktop expansion unit enables PCs and workstations to use the same building blocks you configure on larger systems

Redundant elements and battery back-up can be added at any time to build highly available configurations that have no single points of failure

FLEXIBILITY BEGINS WITH BUILDING BLOCKS

Disk, tape, and optical **building blocks** are the core of StorageWorks solutions. These are Digital's best 3.5-inch and 5.25-inch industry-standard devices enclosed in carriers. Building blocks are ready to be plugged in wherever you need them because the carriers provide the consistent mechanical mounting and shielding needed to support complete configuration flexibility. The carriers' unique connectors and the electronics within also enable users to remove and insert building blocks without powering down the storage subsystem.

No tools are needed to snap the building blocks easily into a StorageWorks desktop expansion unit that sits under your monitor. Or you can incorporate the building blocks into StorageWorks shelves designed to fit into CPU cabinets, expansion cabinets, or deskside pedestals. When your needs change, remove the building blocks and reconfigure them across a growing number of platforms.

SHELVES ARE THE BACKBONE OF MODULAR STORAGE

Two shelf designs integrate storage components. **Building-block shelves** primarily hold storage building blocks. **Controller shelves** hold larger controller modules and controller cache. Each shelf is cooled by redundant blowers and requires at least one carrier-mounted universal power supply. A second power supply or a battery backup can be added for redundancy.

Building-block shelves are pre-wired with a backplane that supports one or two SCSI-2 buses. As you insert building blocks into the shelves, the devices automatically connect to the bus and power. The total number of building blocks in a shelf will vary. If you install only one power supply, you can insert seven 3.5-inch building blocks. Depending on your needs, you can add a second power supply or battery backup unit in one of those slots, or a signal converter that extends allowable SCSI cable lengths. Within a shelf, you can intermix 5.25-inch and 3.5-inch building blocks in any combination. Each 5.25-inch building block takes three slots.

Controller shelves house controllers that support additional capabilities across devices on multiple SCSI buses, including the technology of RAID (Redundant Array of Independent Disks). Two controllers can be installed in a controller shelf to obtain the higher availability that redundancy provides. Using dual paths and redundant components, it's easy to configure systems with no single point of failure. You don't have to order special "redundant-ready" variants to gain that flexibility. You can buy duplicate components later, when you add critical applications.

ENCLOSURES PUT SHELVES TO WORK

You can mount shelves in a variety of enclosures to suit your configuration requirements.

The **deskside expansion unit** is a building-block shelf already installed in a pedestal kit which outfits a shelf with a power controller, front and back doors, and feet. It's the ideal modular storage for systems that support workgroups or

There's no need to power down the subsystem or use any tools to swap out modular storage components – they're hot – pluggable.

for workstations that require a large amount of local data. If needed, you can remove the shelf from the pedestal kit, attach brackets, and mount it in a cabinet.

Two **datacenter cabinets** are versatile enclosures that can contain complete storage solutions. The large SW800 cabinet stands 1700mm tall and is 800mm wide. It can house 24 shelves, half accessed from the front, half from the back. Building-block shelves and controller shelves can be intermixed. In place of the top four shelves, you can install one or two half-rack DLT (Digital Linear Tape) magazine subsystems to provide a complete storage and backup subsystem in a single cabinet. Up to four DLT subsystems can be installed in the SW800 cabinet to support centralized backup operations.

You can install rack-mount HSC95 controllers in the large datacenter cabinet in addition to multiple shelves. Along with Digital's traditional storage products for the CI (Computer Interconnect), HSC95 controllers now support StorageWorks devices via SCSI data channel cards. Two HSC95 controllers can be mounted in an SW800 StorageWorks datacenter cabinet along with eight building-block shelves. Alternatively, two HSC95 controllers can share a cabinet with four building-block shelves and one or two DLT magazine subsystems.

The SW500 cabinet is a waist-high enclosure for up to ten StorageWorks shelves. Using single-phase power, it enables you to locate considerable storage inside or outside of a datacenter environment. You can install up to six shelves in front and four in back of this cabinet, which is about half as large as the SW800 unit. Like the large cabinet, one or two DLT magazine subsystems can be installed in place of four shelves in the SW500 cabinet.

SPECIFICATIONS

Shelves:	
Shelf models	Building block Controller
Supported elements in building-block shelves	One or two universal power supplies (carrier-mounted) Battery backup (carrier-mounted) Signal converter (carrier-mounted) Building blocks (devices in carriers) Redundant cooling fans SCSI cabling
Building block form factors	3.5-inch 5.25-inch
Supported building blocks	Disk drives Tape drives Tape magazine subsystems CDROM 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
Supported elements in controller shelves	One or two universal power supplies (carrier-mounted) One or two controller modules
Cabinets:	
Maximum shelves	24 in SW800 10 in SW500
Compatible devices	Half-rack DLT (Digital Linear Tape) Subsystems
Desktop Expansion Enclosure:	
Supported devices	All 3.5-inch building blocks CDROM drive (pre-installed) TZ30 95 MB cartridge tape drive (pre-installed)
Power Requirements:	
Shelf/deskside Expansion unit	100-240 VAC 50/60 Hz 164 Watts input/131 Watts maximum output
SW800 cabinet	100-240 VAC 50/60 Hz 3.14 KW per cabinet maximum One or two power distribution units (three-phase)
SW500 cabinet	100-240 VAC 50/60 Hz 1.3 KW per cabinet maximum One or two power distribution units (single-phase)
Desktop expansion enclosure	100-240 VAC 50/60 Hz 94 Watts input/78 Watts maximum output

Every SW800 and SW500 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 applications.

A **desktop expansion unit** brings the advantage of using StorageWorks building blocks to your workstations and PCs. These 60mm-high expansion boxes can fit above or below a system box, with minimal effect on the height and tilt of a monitor on top. There are three models to choose from. The first is dedicated to storage expansion, providing three empty slots ready to accept three 3.5-inch building blocks. Two other models have a software load device factory-installed and two empty slots available for you to insert StorageWorks building blocks. You can choose models with either an RRD42 CDROM drive or a TZ30 tape drive (that uses popular TK50 cartridges) already installed.

PROVIDING EVERYTHING YOU NEED

Digital offers a full complement of **SCSI cables** to handle any equipment design situation, and **power cords** to meet worldwide power requirements.

We also make available the **SCSI signal converter** (DWZZA), required whenever building-block shelves are located in a cabinet separate from the host system or controller. The DWZZA converter changes the single-ended SCSI signals used by the building blocks to differential SCSI signals. Capable of operating over an additional 25 meters of cable, differential SCSI provides the flexibility many configurations require.

SPECIFICATIONS continued

Environmental:			
Operating temperature	10°C to 40°C (desktop expansion unit to 35°C)		
Non-operating	-40°C to 66°C		
Relative humidity	10% to 80%		
Regulatory Approvals:			
SW800, BA350, components	FCC-A, UL, CSA, VDE, TÜV		
SW500, desktop expansion unit	FCC-A, CE-MARK, UL, CSA, TÜV		
Physical:			
	Height(mm/in)	Width(mm/in)	Depth(mm/in)
Shelves	150/5.8	445/17.5	350/13.8
Deskside expansion enclosure			
Single shelf	565/22.2	209/8.2	432/17.0
Double shelf	565/22.2	356/14.0	432/17.0
SW800 cabinet	1700/66.6	800/31.5	875/34.4
SW500 cabinet	1100/43.1	600/23.5	875/34.4
Desktop expansion enclosure	60/2.4	432/17.0	400/15.8

THE BENEFITS OF MODULAR DESIGN

Beyond configuration flexibility, StorageWorks modular storage solutions from Digital are designed to lead the industry with low cost-of-ownership. All components are exceptionally reliable and can be used in pairs for extra availability. And, since you can swap building blocks, power supplies, even cooling fans – you yourself can resolve problems faster than logging a service call.

Affordable solutions tailored to your precise needs are advantages you'll gain immediately with StorageWorks products. But the ultimate benefit in choosing Digital's flexible, modular storage will reward you for years to come. When changing requirements obsolete other storage, your StorageWorks solutions will meet the challenge of change.