

### Overview

#### (formerly known as StorageWorks 4400 Enclosure I/O Upgrade Modules)

The Ultra320 I/O Module allows the StorageWorks 4200 or 4300 Enclosures to be upgraded to Ultra320 performance in less than five minutes. The ease of upgrading to Ultra320 proves to our customers that the StorageWorks 4200 and 4300 Enclosures provide the lowest cost of ownership in the market. In addition to upgradeability, the Ultra2/Ultra3/Ultra320 mix and match compatibility of the Enclosures proves that technology transitions to the next generation SCSI protocol can be simple and smooth without disrupting critical business environments.

**NOTE:** The upgrade kit also ships with an Environmental Monitoring Unit (EMU). Upgrading this EMU is required with the upgrade to the U320 I/O Module in order for enclosure to operate properly at U320 interface speeds.

### Models

Ultra320 Single Bus I/O Module for MSA30	287484-B21
Ultra320 Dual Bus I/O Module for MSA30	287483-B21

### Customer Benefits

<b>Higher Performance</b>	Ultra320 SCSI transfer rates allow the MSA30 to achieve the greatest I/Os per second.
<b>Upgradeability</b>	Ultra320 single bus and dual bus I/O upgrade modules make upgrading the StorageWorks 4300 Enclosure to Ultra320 quick and easy. <b>NOTE:</b> U320 performance requires a compatible U320 controller. This is noted in the product documentation. A U320 compatible EMU is also required for upgrades to U320 I/O modules.
<b>Mix and Match</b>	When Ultra2, Ultra3 and Ultra320 devices are found on the same Ultra320 SCSI bus, each Ultra2 device will transfer data up to 80 MB/s, while each Ultra3 device will transfer data up to 160 MB/s, and each Ultra320 device will transfer data up to 320 MB/s. (Requires a Ultra320 controller for each drive to reach maximum I/Os as listed here.)
<b>Investment Protection</b>	With the ability to upgrade, as well as mix and match existing Ultra2/Ultra3 components with Ultra320, HP makes technology transitions simple and cost effective. HP offers two Ultra320 I/O Module Upgrades Kits for the StorageWorks 4200/4300 Enclosure Family: <ul style="list-style-type: none"><li>● Ultra320 Single Bus I/O Module - The Ultra320 single bus I/O module allows one SCSI channel to access all drives in the StorageWorks 4200/4300 Enclosure.</li><li>● Ultra320 Dual Bus I/O Module - The Ultra320 dual bus I/O module allows two SCSI channels to access a single StorageWorks 4200/4300 Enclosure. This allows for greater fault tolerance (controller duplexing) or provides access from two different servers to two separate storage areas.</li></ul>

**NOTE:** Each Ultra320 I/O Module Upgrade Kit includes an upgraded EMU that must be deployed each time an upgrade to a Ultra320 I/O Module occurs with a StorageWorks 4200/4300 Enclosure. To achieve U320 performance the I/O modules and U320 compatible EMU must be connected to a U320 controller and the hard disk drives must be U320.

### Product Highlights

#### Key Features

- Ultra320 (LVD) support - Delivering data transfer rates up to 320 MB/s per channel
- Ultra320 upgradeability for the StorageWorks 4200/4300 Enclosure families
- Ultra2/Ultra3/Ultra320 mix and match within network or array attachment
- Single bus or dual bus I/O modules available
- Warm-swappable I/O module allows power to unit to remain active
- Kit includes warm pluggable EMU with U320 support
- Easy removal of parts allows for easy and quick upgradeability. No tools are required!

#### Upgradeability

Upgrading a StorageWorks 4200/4300 Enclosure to Ultra320 is as easy as swapping out the I/O module and the EMU on the back of the unit. Both modules are warm-swappable, therefore during the upgrade power to the unit can remain on, but all I/O operations need to be stopped to ensure that no data is lost or corrupted during the upgrade.

**NOTE:** U320 performance requires a compatible U320 controller. This is noted in the product documentation. A U320 compatible EMU is also required for upgrades to U320 I/O modules.

#### Mix and Match

All Ultra320 devices from HP are compatible with previous Ultra2 and Ultra3 devices so customers can mix and match components in the same storage enclosure or server. When Ultra2, Ultra3 and Ultra320 devices are found on the same Ultra320 SCSI bus, each Ultra2 device will transfer data up to 80 MB/s, while each Ultra3 device will transfer data up to 160 MB/s, and each Ultra320 device will transfer data up to 320 MB/s. (Requires a Ultra320 controller for each drive to reach maximum I/Os as listed here.)

#### Fault Tolerance

The dual bus I/O module, as well as redundant power supplies and fans, allows the MSA30 family to provide high levels of system availability.

#### Compatibility and Integration Testing

Intensive compatibility and performance testing with HP ProLiant servers, Alpha servers, and StorageWorks products ensures the highest level of integration available in the industry for a HP server or StorageWorks solution. For a complete list of supported HP servers and workstations, please refer to the QuickSpecs and/or User Guide of the array controller or Host Bus adapter that you are planning to use. The list of supported array controllers and SCSI adapters is provided under "Related Options, Controllers."

#### Warranty

Ultra320 I/O Module Upgrade Kit for the StorageWorks Enclosure 4200/4300 family: Three-year limited warranty

**NOTE:** Certain restrictions and exclusions apply.

### Related Options

**NOTE:** This is a list of supported related options. Some may be discontinued.

	Description	Part Number
Controllers	Smart Array 6404/256 Controller	273914-B21
	Ultra320 Expansion Module for SA-6402	273911-B21
	Smart Array 6402/128 Controller	273915-B21
	Smart Array 5302/128 Controller	283552-B21
	Smart Array 5304/256 Controller	283551-B21
	Smart Array 642 Controller	291967-B21
	Smart Array 5i/5i Plus	N/A
	<b>NOTE:</b> Single external SCSI channel supported on select ProLiant Servers. See Server QuickSpecs for specific model information.	
	HSG80 Controller	176622-B21
	<b>NOTE:</b> HSG80 connection to the StorageWorks 4300 requires the use of the Model 2200 controller shelf (PN: 135820-B21).	
64-Bit/66MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternative OS	284688-B21	
1 channel Ultra2 (LVD) Adapter (AlphaServers)	3X-KZPCA-AA	
Hard Drives	72.8-GB 10,000 rpm, U320 Universal Hard Drive (1")	286714-B22
	146.8-GB 10,000 rpm, U320 Universal Hard Drive (1")	286716-B22
	300-GB 10,000 rpm, U320 Universal Hard Drive (1")	350964-B22
	36.4-GB 15,000 rpm, U320 Universal Hard Drive (1")	286776-B22
	72.8-GB 15,000 rpm, U320 Universal Hard Drive (1")	286778-B22
	<b>NOTE:</b> For complete compatibility information, refer to the HP SCSI Hard Drive Compatibility table located at <a href="http://www.hp.com/products/harddiskdrives">http://www.hp.com/products/harddiskdrives</a> . Using hard drives in unsupported configurations will result in voiding of the warranty and could result in damage to the drive and/or loss of data.	
SCSI Cable Options	1M SCSI cable for connection to the Model 2200 Controller Shelf	168256-B21
	2M SCSI cable for connection to the Model 2200 Controller Shelf	168257-B21
	3M SCSI Cable for connection to the Model 2200 Controller Shelf	188505-B21
	5M SCSI cable for connection to the Model 2200 Controller Shelf	400983-005
	10M SCSI cable for connection to the Model 2200 Controller Shelf	400985-010
	12' VHDCI - 68-pin SCSI Cable	341177-B21/291
	1M SCSI 68HD Cable	BN38C-01
	<b>NOTE:</b> This SCSI cable is only intended for use with the KZPCA-AA host bus adapter.	
	2M SCSI 68HD Cable	BN38C-02
	<b>NOTE:</b> This SCSI cable is only intended for use with the KZPCA-AA host bus adapter.	
	3M SCSI 68HD Cable	BN38C-03
	<b>NOTE:</b> This SCSI cable is only intended for use with the KZPCA-AA host bus adapter.	
	5M SCSI 68HD Cable	BN38C-05
	<b>NOTE:</b> This SCSI cable is only intended for use with the KZPCA-AA host bus adapter.	
	10M SCSI 68HD Cable	BN38C-10
	<b>NOTE:</b> This SCSI cable is only intended for use with the KZPCA-AA host bus adapter.	
12-ft (3.7-m) VHDCI to VHDCI SCSI Cable	341175-B21	
24-ft (7.3-m) VHDCI to VHDCI SCSI Cable	164604-B21	
39-ft (12-m) VHDCI to VHDCI SCSI Cable	150214-B21	

### Technical Specifications

<b>Protocol Support</b>	Wide Ultra320 (LVD)
<b>O/S Support</b>	Defined by specific HP array controller or SCSI adapter used; please refer to the QuickSpecs and/or User Guide of the specific array controller or SCSI adapter.
<b>Shipping Dimensions</b> (H x W x D)	Ultra320 Single I/O Module 19.63 x 17.25 x 3.75 in (49.86 x 43.81 x 9.53 cm) Ultra320 Dual I/O Module 19.63 x 17.25 x 3.75 in (49.86 x 43.81 x 9.53 cm)
<b>Weight</b>	Ultra320 Single I/O Module 4.85 lb (2.20 kg) Ultra320 Dual I/O Module 4.85 lb (2.20 kg)
<b>Controllers and Adapters Supported</b>	Smart Array 6404/128 Smart Array U320 Expansion Module Smart Array 6402/256 Smart Array 5302/128 Smart Array 5312 Smart Array 5304/256 Smart Array 642 Smart Array 532 Smart Array 5i/5i Plus <b>(NOTE: Single external SCSI channel supported on select ProLiant Servers. See Server QuickSpecs for specific model information.)</b> HSG80 Controller HSG60 Controller 64-bit/133MHz dual channel Ultra320 SCSI Adapter 64-Bit/66MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternative OS 1 channel Wide Ultra2 Adapter (AlphaStations) 1 channel Wide Ultra2 Adapter (AlphaServers) See your server and controller compatibility matrix for details on controller and server compatibility.
<b>I/O Module Connector</b>	Very High Density Cable Interconnect (VHDCI)
<b>Product Kit Contents</b>	<b>Ultra320 Single I/O Module</b> Single bus Ultra320 I/O module, EMU (required for system to operate properly with U320 I/O module, warranty card, and enclosure user guide) <b>Ultra320 Dual I/O Module</b> Dual bus Ultra320 I/O module, EMU (required for system to operate properly with U320 I/O module), warranty card, enclosure user guide <b>NOTE: A different SCSI cable may be required when the StorageWorks Enclosure 4200 is intended for connection to an HSG80 controller in a Model 2200 controller shelf or a host-based adapter on an Alpha server. See the related options section for cable ordering information.</b>

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