



V/SMD 4400 Phoenix

High-Performance SMD
(Storage Module Device)
Disk Controller for
Sun Microsystems' Workstations

The V/SMD 4400 Phoenix extends Interphase Corporation's proven record for high-performance SMD (Storage Module Device) disk controllers to Sun Microsystems' workstations.

The V/SMD 4400 Phoenix builds on Interphase's technology base that has been developed while successfully supplying state-of-the-art disk controllers to the Multibus and VMEbus market for more than a decade. The experience gained from developing pacesetter VMEbus disk controllers, the V/SMD 3200 and V/SMD 4200 Cheetah, has been used to make the Phoenix the highest performance disk controller available for Sun workstations. The result is not just an outstanding controller, in keeping with Interphase's position as a performance and innovation leader in the industry, but also a controller that has demonstrated its quality, reliability and performance capabilities in the most demanding of all situations – actual user installations.

The Phoenix can run with a 1:1 interleave while keeping up with the Sun file system. And it can attain faster data transfer rates over the bus than any other disk controller because of Interphase's proprietary BUSpacket InterfaceSM. This, in concert with other proprietary innovations such as the multitasking Virtual Buffer ArchitectureSM, UNIX-optimized intelligent caching and zero latency reads and writes, enables the Phoenix to out-perform any other SMD disk controller that can be put into a Sun system.

DESIGNED FOR SUN WORKSTATIONS

The V/SMD 4400 Phoenix has been designed especially for Sun workstations. Its 9U x 400mm size plugs directly into Sun systems without any cumbersome and expensive adapter or bracket. It can replace the controller in an existing system using the existing disks and industry standard dual row ribbon cable connectors. The V/SMD 4400 Phoenix emulates the Sun controller to allow use of the Sun software for formatting and booting.

BOOTING

The V/SMD 4400 Phoenix fully supports booting for Sun 2, 3, and 4 with SunOS 3.x or SunOS 4.0. No modifications to the Sun processor are required.

POWERFUL AND SMART

The V/SMD 4400 Phoenix is a powerful and intelligent controller that can directly connect to as many as four SMD disk drives or Extended SMD drives (SMD-E). It has full ECL interfaces for the newest SMD-E drives, including those with disk data rates as high as 24 MB/s. Different speed drives may even be mixed on the same controller.

With an on-board Motorola 68000 processor, Interphase's BUSpacket Interface and the Virtual Buffer Architecture, the V/SMD 4400 Phoenix has speed and performance unmatched in the industry.

HIGH SPEED

The multitasking Virtual Buffer Architecture allows simultaneous data movement between both the Phoenix and the disks and between the Phoenix and the system memory. The on-board 68000 processor supervises all of this activity, including the management of the large 128K pool of data buffers. The Phoenix can run the Sun file system with a 1:1 interleave, which means faster operations all around because the read ahead caching significantly reduces the rotational latencies associated with disk accesses.

BUSpacket INTERFACE

Interphase's innovative BUSpacket Interface is an essential element of the outstanding performance of the V/SMD 4400 Phoenix. By putting the data in a very fast BUSpacket FIFO controlled by an asynchronous, delay line-based state machine before connecting to the bus, the BUSpacket Interface achieves data transfer rates that are higher than any other disk controller available for Sun workstations.

On a disk read, for example, the BUSpacket Interface pre-formats a packet of data and stores it in the fast BUSpacket FIFO prior to acquiring control of the bus. Once the bus has been acquired, the FIFO is emptied as quickly as the bus and system memory allow and then the bus is released for other uses. This drastically



reduces bus bandwidth usage by the disk controller with a corresponding improvement in overall system performance. This can even allow the configuration of systems with multiple controllers in the same backplane.

VIRTUAL BUFFERING

The V/SMD 4400 Phoenix's 68000 processor allocates and deallocates sector buffers (from the 128K pool of memory) for various system processes. This feature eliminates read overruns and write underruns often found in less sophisticated FIFO-based controller designs.

Zero Latency

On a disk read, traditional controllers wait until the head encounters the requested sector before reading and transferring data. The Phoenix's zero latency reads (and writes) eliminate this delay. The Phoenix begins reading data as soon as the head lands on the proper track. All sectors of interest are transferred to the controller immediately, regardless of their order on the disk. In this way, the Phoenix can read (or write) an entire track in only one revolution of the disk.

Intelligent Caching

The Virtual Buffer Architecture also provides the facilities to perform intelligent caching. After requested sectors have been read and transferred, the Phoenix continues reading ahead. The next logically contiguous data, up to and including the next track, are read into the cache buffer. Then, when the host requests data that is stored in cache, a disk access (with its associated delays) is not needed. The large buffer on the V/SMD 4400 Phoenix allows multiple tracks of data to be stored, further increasing the effectiveness of caching. System response is significantly improved because the file system interleave can be eliminated.

ERROR CORRECTION

Data written on the disk is protected from media defects by 32- or 48-bit Error Correction Code (ECC), which is capable of correcting errors up to 15-bits wide. A 48-bit ECC is standard.

GOOD FOR UNIX

The V/SMD 4400 Phoenix enhances the performance of the UNIX operating system. Throughput of the file system for both large and small transactions is improved because of the Phoenix's architecture. Tests have demonstrated that Interphase's Intelligent Caching yields significant improvements over cacheless 1:1 interleaving techniques for file-oriented transactions. The need for sector interleaving is completely eliminated.

FLEXIBILITY

The V/SMD 4400 Phoenix supports a wide range of system variations with a number of programmable system parameters, including burst rates, multiple interrupt vectors and variable bus configurations. Because of the simple, memory-resident method of setting parameters when the system is initialized, the Phoenix allows you to use virtually any type of SMD disk drive in your Sun system.

EASY TO INSTALL AND USE

The V/SMD 4400 Phoenix is fully supported by Interphase Corporation with auto-installation software, a full function queuing driver, a run-time formatter, and other utilities. Both on-site and telephone field support are available. And of course the Phoenix is covered by the normal Interphase one year warranty. If there is ever a hardware problem, in or out of warranty, there are a variety of service options, each designed to minimize your downtime, inconvenience, and expense.

If you need shielded cables, choose the 4400-4 or 4400-4a.

THE NEXT STEP

Interphase is ready to help get your Sun system up and running. Choose between the V/SMD 4400-3 Phoenix with 48-bit ECC or the V/SMD 4400-3a Phoenix with 32-bit ECC. Please specify Sun system and OS. Drivers and utilities are included. Call us today to take the next step.

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