



## PRODUCT OVERVIEW

The Marvell® 88SM4140 port multiplier device offers the industry's first solution for port expansion. The device enables one active host connection to communicate with up to 4 Serial ATA disk drives. The device uses Marvell's production-proven Serial ATA PHY technology and supports both 1.5 Gbps and 3.0 Gbps speeds with adjustable pre-emphasis and amplitude settings on all 5 ports (1 host, 4 device) for tuning high-speed, long-trace backplane implementations. The device also provides one Storage Enclosure Management Bridge (SEMB) port for communication with a Storage Enclosure Processor (SEP). Per the Serial ATA II specification, the 88SM4140 device supports command-based and FIS-based switching supporting simultaneous queued operations to all attached devices. The 88SM4140 product also supports a Marvell-proprietary mode called queued command based switching which enables the performance advantages of FIS-based switching but with reduced complexity.

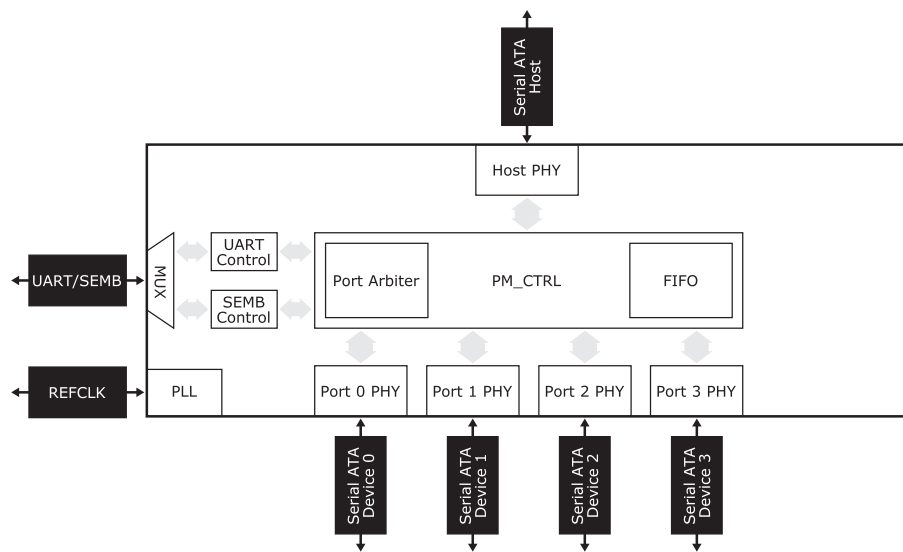


Fig 1. Serial ATA II Port Multiplier (88SM4140) Block Diagram

## FEATURES

- 1.5/3.0 Gbps PHY operation
- FIS-based switching
- Queued command-based switching (Marvell Proprietary)
- 1 SEMB port
- Staggered HDD spin-up
- SATA BIST over host and device links
- Programmable pre-emphasis and amplitude per port
- Spread Spectrum Clocking (SSC)
- 1.2V and 3.3V power
- Compatible with Marvell 88SX60xx Serial ATA II host controllers and 88SA8040 Parallel ATA to Serial ATA bridges

## BENEFITS

- Supports next-generation HDD designs
- Superior performance by allowing the host to have outstanding commands to multiple devices at any point in time
- Allows performance advantages of FIS-based switching but with reduced complexity
- Allows connection to off-chip SEP for enclosure
- Allows host-side control of HDD spin-up to manage power budget during system power-up
- Enable optimal per-port PHY tuning for Serial ATA backplane designs
- Reduces EMI for enterprise storage and server applications
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- Interface flexibility
- End-to-end system interoperability





## APPLICATIONS

The 88SM4140 1:4 Serial ATA II port multiplier, when combined with the Company's market-leading 88SX60xx Serial ATA II 4 or 8-port host controllers, will enable enterprise-class port expansion inside storage arrays, RAID subsystems and servers. Further, the port multiplier is also ideal for next-generation home storage applications, enabling up to 1 Terabyte (1,000 GB) of storage expansion for video, audio and high-resolution graphics or photos inside digital set top boxes, digital video recorders (DVRs), or PCs and laptops. For example, 1 Terabyte of expanded storage could hold over 250,000 songs or over 1,000 full-length feature films.

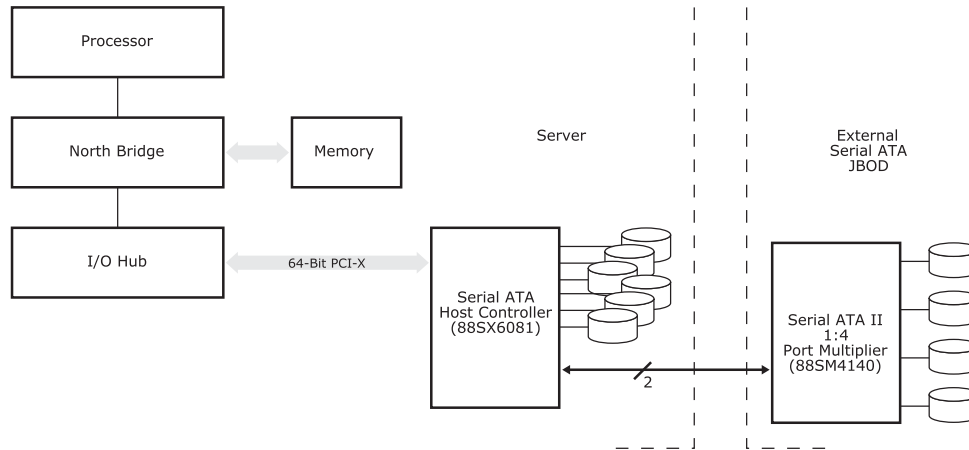


Fig 2. Serial ATA Port Multiplier (88SM4140) Applications Diagram

**THE MARVELL ADVANTAGE:** The Marvell 88SM4140 Serial ATA II port multiplier comes with a complete set of hardware and software development tools to assist engineers developing next generation storage networking solutions. Marvell's worldwide field applications engineers collaborate closely with storage networking equipment vendors to develop and deliver innovative products to market. Marvell utilizes recognized world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low cost total solutions.

For more information, visit our website at [www.marvell.com](http://www.marvell.com).



Marvell Semiconductor, Inc.

700 First Avenue  
Sunnyvale, CA 94089  
Phone 408.222.2500  
[www.marvell.com](http://www.marvell.com)

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