

SmartIOC 2200 PCIe® Gen 4 SAS-4 Tri-Mode IO Storage Controllers

High-Performance IO with Optional Encryption and Basic Data Protection for Server Storage

Summary

The SmartIOC 2200 family is the industry's most versatile, fully featured and secure NVMe/SAS/SATA server storage connectivity solution. The SmartIOC 2200 offers up to $\times 16$ PCIe® connectivity to the host, up to 32 tri-mode storage lanes and advanced manageability through industry-standard interfaces, providing high-performance connectivity with the essential features to enable data center architectures of tomorrow.

The SmartIOC 2200 adds key media enablement features, such as an integrated PCIe Gen 5 switch with bifurcation down to $\times 1$ and SAS-4 connectivity with Dynamic Channel Multiplexing (DCM) and important security features such as hardware root-of-trust. The robust SmartIOC 2200 offers basic hardware RAID and native HBA modes for NVMe, SAS-4 and SATA media and fully transparent mode for NVMe media.

Highly efficient storage IO aggregation is now within reach with DCM, which provides bandwidth aggregation for lower speed drives over SAS-4 link when connected to Microchip's family of SXP 24G SAS-4 expanders.

These fifth-generation IO Controllers include a fully integrated PCIe switch based on Switchtec™ technology for minimum latency and maximum performance when connecting to NVMe media. Capable of $\times 1$ through $\times 8$ bifurcation, the SmartIOC 2200 is ready for all performance grades and configurations of NVMe SSDs.

SmartIOC 2200 introduces built-in hardware root-of-trust, providing the solid foundation needed for safeguarding information. The SmartIOC 2200 family's trusted platform support includes firmware signing with Secure Boot and Secure Update features to ensure firmware integrity and authenticity in the end-to-end value chain.

The SmartIOC 2200 offers a comprehensive feature set for enterprise server data storage solutions and best-in-class performance. This highly integrated solution offers up to $\times 16$ PCIe connectivity to the host, up to 32 storage lanes and advanced manageability through industry-standard interfaces. Like all of the Smart Storage solutions, drivers for all major operating systems and a comprehensive set of management tools (including a GUI and CLI) are available, enabling unified management across your server and storage infrastructure. Big data just got easy.

Highlights and Benefits

Tri-Mode Support

- Automatic PCIe, SAS and SATA detection and link speed negotiation enabled by Universal Backplane Management (UBM)
- Various RAID, HBA or transparent modes selectable per drive

NVMe Storage Management

- Integrated Switchtec PCIe Gen 2 (5 GT/s), Gen 3 (8 GT/s) and Gen 4 (16 GT/s) Switch Support
- Low latency to NVMe targets in native or RAID modes
- Flexible port bifurcation, transparent and non-transparent (NT) bridging and NT address translation
- PCIe error containment (including downstream port containment, upstream error containment, completion timeout synthesis and poisoned TLP blocking)
- Up to 32 lanes of NVMe media support, down to $\times 1$ bifurcation
- 16-lane or 8-lane host support

SAS Storage Management

- Each PHY supports 24G SAS-4 with up to 2.4 Gbps bandwidth
- DCM for near 100% efficient bandwidth aggregation for all SAS/SATA drive rates over SAS-4 links

Performance

- >3.0M 4K RR IOPs and up to 26 GBps bandwidth Secure

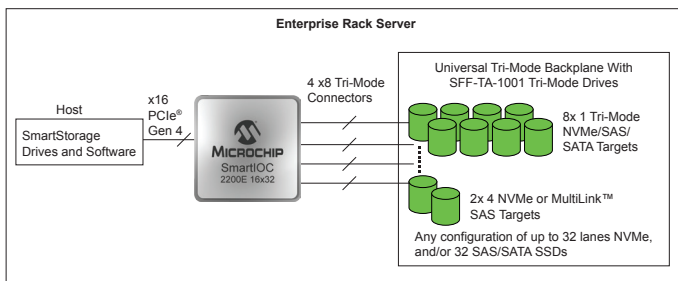
Smart Storage Solutions Software

- Driver and unified management utilities for all major operating systems
- maxView™ GUI and ARCCONF CLI for management
- UEFI pre-boot with GUI and CLI support
- Autonomous event monitor
- Third-party plugins, including vSphere and OpenStack

Security and Data Protection

- Supports RAID levels (all cacheless): 0, 1, 10, 5
- SAS and NVMe encryption (IEEE 1619-compliant AES-XTS for data-at-rest encryption)
- FIPS 140-2, Levels 1–3 certifiable
- Secure Key Encryption Key (KEK) Management
- Hardware assist for error recovery
- Hardware root-of-trust Secure Boot and Secure Update

Managed Mixed NVMe/SAS Storage

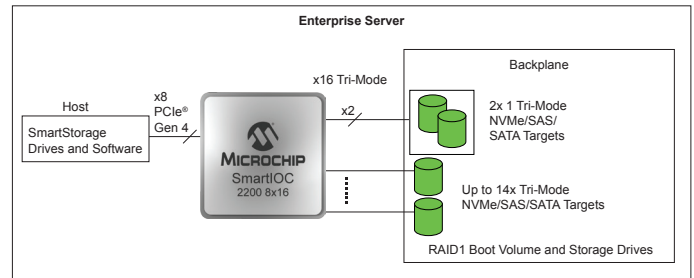


The Unified Smart Storage Solution means ease-of-management: manage mixed NVMe and SAS topologies with a single pane-of-glass.

Ordering Information

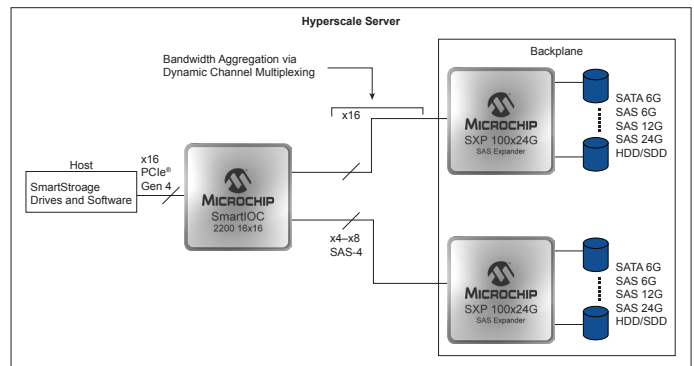
Part Number	Product	Host/Disk	Encryption	Memory	Packaging
PM8252B-F3EI	SmartIO 2200 8 × 8	8/8	No	16b DDR4	25 mm × 25 mm
PM8253B-F3EI	SmartIO 2200e 8 × 8	8/8	Yes		25 mm × 25 mm
PM8262B-F3EI	SmartIO 2200 8 × 16	8/16	No		25 mm × 25 mm
PM8263B-F3EI	SmartIO 2200e 8 × 16	8/16	Yes		25 mm × 25 mm
PM8270B-F3EI	SmartIO 2200 16 × 16	16/16	No		31 mm × 31 mm
PM8271B-F3EI	SmartIO 2200e 16 × 16	16/16	Yes		31 mm × 31 mm
PM8274B-F3EI	SmartIO 2200 16 × 32	16/32	No		31 mm × 31 mm
PM8275B-F3EI	SmartIO 2200e 16 × 32	16/32	Yes		31 mm × 31 mm
PM8266B-FEI	SmartIO 2200 16 × 32	16/32	No		35 mm × 35 mm
PM8267B-FEI	SmartIO 2200e 16 × 32	16/32	Yes		35 mm × 35 mm

Flexible Boot RAID 0 with NVMe/SAS Storage



Utilize hardware RAID for Boot devices and still have plenty of lanes for performance NVMe, Enterprise SAS, or cold storage.

Dense Cloud Storage



SmartIO provides a new tier of storage fan-out with Dynamic Channel Multiplexed SAS-4 links to provide near 100% efficiency to targets such as SAS3 and SATA.