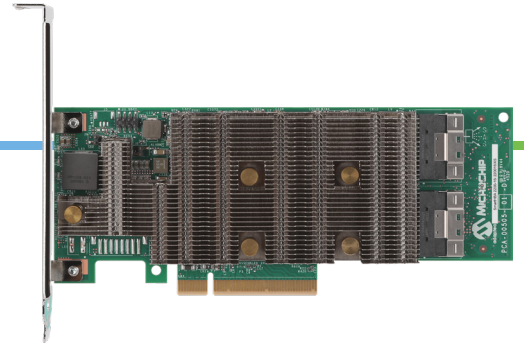


Adaptec® SmartHBA 2200 Series: 16i

Tri-Mode SAS/SATA/NVMe™ Host Bus Adapter with Basic Hardware RAID

Host: x8/x16 PCIe® Gen 4

Media: 24G SAS, 6G SATA, PCIe Gen 4 NVMe



Maximum Performance and Security With Tri-Mode Functionality and Basic RAID

The Adaptec® SmartRAID 3200 family is the industry's most versatile, fully featured and secure full RAID enabled Tri-Mode SAS/SATA/NVMe server storage performance solution for server OEM, storage systems, data center and enterprise customers. The SmartHBA 2200 PCIe Gen 4 to Tri-mode host bus adapter is performance optimized for the lowest possible cost.

Built on Microchip's proven 5th generation storage controller, the SmartIOC 2200, the SmartHBA 2200 product supports a x8 PCIe Gen 4 host interface with 16 media facing port variants for internal Tri-mode connectivity. The SmartHBA 2200 is specifically designed for the most demanding NVMe and multi-port SAS SSD applications. The SmartIOC 2200 integrated PCIe Switch enables DirectPath technology - the industry's lowest latency and high bandwidth NVMe solution and the flexibility to support x1, x2, x4, and x8 wide NVMe SSDs.

This industry first 24G SAS adapter supports SAS-4 connectivity as well as Microchip's Dynamic Channel Multiplexing (DCM) technology that aggregates expander attached SAS or SATA hard drives onto 24G SAS infrastructure with near 100% link efficiency for unparalleled throughput. Native HBA modes for all media types are also supported, which offers the lowest latency for memory-based PCIe storage. Superior performance enables the SmartHBA 2200 to reach up to 13 GB/s throughput and 3.5M+ IOPs 4K random reads.

Microchip's Trusted Platform support delivers a new level of compute and supply chain security based on a hardware root of trust that is aligned with the Open Compute Security Project.

Entry-Level RAID Functionality

The SmartHBA 2200 combines uncompromised HBA functionality with basic cacheless RAID support in hardware using the SmartIOC 2200 silicon. Robust RAID support is the same for all platforms and operating systems, providing a consistent user experience. Meta-data compatibility with SmartRAID 3200 products allows customers to upgrade to a full-feature hardware RAID solution with caching for acceleration if needed. The SmartHBA 2200 supports up to 16 direct-attached hard disk drives or SSDs in RAID configurations using RAID levels 0, 1, 10 or even RAID 5, and can simultaneously use RAID arrays and raw devices in mixed mode.

Seamless Media Support with Tri-Mode Connectivity

The SmartHBA 2200 supports both Intel® Virtual Pin Port (VPP) for intelligent backplane management and SFF's Universal Backplane Management (UBM) standards to simplify integration and enhance product flexibility for system integrators. UBM support enables auto-detection of the media type and interface bifurcation. SGPIO and SCSI Enclosure Services (SES) allow a common way to manage device status and activity for directly connected storage devices or for devices connected behind a SAS expander.

The Smart Storage platform supports industry leading storage management including standards-based Platform Level Data Model (PLDM)/Redfish® Device Enablement (RDE) to simplify integration and Microchip's ChipLink Diagnostic Tool with signal integrity analysis and context sensitive documentation to accelerate time to market.

The Adaptec SmartHBA 2200 adapter support a wide range of software solutions including Microsoft® Storage Spaces Direct, VMWare vSAN and OpenStack Swift/Ceph.

Benefits

- Ideal for enabling PCIe Gen 4 storage capabilities for hyperscale applications, enterprise, and SMB, with proven reliability
- Tri-mode support for SAS/SATA/NVMe devices
- Combines full-featured, high-performance HBA functionality with basic hardware RAID
- Built-in PCIe switch to enable ultra-low latency access to NVMe storage devices
- Superior performance enabling up to 13 GB/s throughput and 3.5M+ IOPs 4K RR

Highlights

- Low profile, MD2 form factor
- Fully tri-mode capable: 16 Gbps NVMe Gen 4, 24 Gbps SAS-4 and 6 Gbps SATA
- 8-lane (x8) PCIe Gen 4 host interface
- Internal SlimSAS connector (using SFF-9402 pinout to support U.2 and U.3)
- Universal backplane management (UBM)
- Virtual Pin Port Management (VPP)
- SES (SAS expander-based backplanes), SGPIO (direct attached SAS/SATA backplanes)
- Secure boot, secure update and attestation
- Dynamic adapter power management
- arconf/maxView support
- Support for 64 NVMe devices and up to 256 SAS/SATA devices
- Broad inbox OS coverage
- Comprehensive out-of-box driver support
- Multi-initiator support
- Support for x86 platform

Key Software Features	<ul style="list-style-type: none"> • Adapter dynamic power management to save up to 30% power • Support for up to 256 SAS/SATA target devices (238 SSDs/HDDs maximum—remainder are reserved for expanders and enclosure management) • Support for NVMe target devices with Gen 3/4 interfaces (x1, x2, x4, and x8 wide interfaces) • Support for up to 128 drives in RAID arrays • Hardware RAID level 0, 1, 10, 5 support • Multi-LUN support • SAS expander support • PCIe® switch support⁴ 	<ul style="list-style-type: none"> • SATA NCQ • MPIO support • Multi-initiator (host)/clustering for SAS • Hot-plug drive support • Automatic/manual rebuild of hot spares • SGPIO, SES, UBM and VPP • S.M.A.R.T. support • BMC support (MCTP PCIe VDM, I²C based, PBSI, MCTP and Platform Level Data Model (PLDM) and Redfish Device Enablement (RDE) for out-of-band (BMC) management • Staggered drive spin-up • Support for native 4K sector and 512-byte SAS/SATA/NVMe devices 	<ul style="list-style-type: none"> • Secure boot, secure update and attestation support • USB image available on www.adaptec.com/en-us/support/start to boot the maxView GUI from any USB device for enhanced GUI-based setup and offline maintenance
Management Utilities	maxView® Storage Manager <ul style="list-style-type: none"> • Web-based GUI management utility • Windows®, Linux®, Solaris, VMware support • Remote configuration, monitoring, notification, and firmware updates • SMI-S support • SMTP 	ARCCONF <ul style="list-style-type: none"> • Command-line interface • Local and remote support • arconf for uEFI shell support • SMI-S support for VMware • ARCCONF CLI support 	uEFI BIOS Configuration Utility <ul style="list-style-type: none"> • HII-based configuration utility • Flashable BIOS support Event Monitor <ul style="list-style-type: none"> • Lightweight event monitoring and logging tool • Distributes adapter events and notifies user
Management Utilities (Out-of-Band)	PBSI, MCTP and PLDM/RDE		
Operating Systems	Microsoft Windows Server, Windows 10, Red Hat Enterprise Linux, CentOS, SuSE Linux Enterprise Server, Ubuntu Linux, Debian Linux, Oracle Linux, Citrix XenServer, Solaris, FreeBSD, VMware ESXi and open-source Linux drivers/inbox drivers (available from www.adaptec.com/en-us/support/start)		
Dimensions	2.713" H × 6.6" L (68.9 mm × 167.65 mm)		
Airflow (0°C to 55°C)	250 LFM airflow Note: Temperature measured 1 inch from adapter		
MTBF	3.0 million hours measured at 40°C		
Regulatory Certification	CE, FCC, UL, C-tick, VCCI, KCC, CNS		
Environmental Compliance	RoHS		

Ordering Information

Product Name	Part Number	Form Factor	Host Interface	Tri-Mode Ports
SmartHBA 2200-16i	220016IX2S	LP/MD2	8-Lane PCIe® Gen 4	16 Internal

*All features may not be available with initial product release. Please contact Microchip for more information.