



The Power Behind the Storage

35TH EDITION

ATTO
Product Brochure
www.pmdmagnetics.com

ATTO

ATTO Technology, Inc.

Corporate Vision

For more than 30 years, ATTO has been an innovator in network and storage connectivity, from developing the first solid-state storage device to the latest data center appliances. ATTO develops high-performance products that manage latency in the most demanding real-time environments resulting in accelerated application performance and enhanced transaction processing. ATTO delivers performance-based solutions to applications, infrastructure, big data, cloud and virtualized environments, including:

- Enterprise - Database, Web Servers, Back-Office Operations
- Departmental - Business Analytics, Supply Chain, Asset Management
- Business Continuity - Stretch, Metro and Campus Clusters
- Workgroup - CAD/CAE, Video Production/Finishing, Scientific, Energy, Medical, AI/ML

ATTO manufactures the industry's broadest portfolio of high-performance network and storage connectivity products, designed and optimized to work together to help customers better store, manage, analyze and deliver data.

- Fibre Channel, SAS/SATA, iSCSI, Ethernet, Thunderbolt™, NVMe, NVMe over Fabric, Host Bus Adapters, Smart Network Interface Cards, intelligent bridges, Thunderbolt adapters and software

ATTO delivers tested solutions which are qualified and certified with industry leading workstation, server, storage and application vendors. This ensures:

- Faster access to new technology
- Features that improve your workflow
- Maximized solution performance and productivity

ATTO provides a unique level of partnership with customers, solution providers and OEMs.



ATTO founders Dave Snell, CTO, and Tim Klein, CEO

The Power Behind the Storage

"We would like to thank our valued industry partners and loyal customers for your continued support. ATTO's primary mission is to provide the best possible customer experience while offering the highest performing, industry leading products and technologies available."

-Timothy J. Klein, President and CEO, ATTO Technology, Inc.

ATTO Product Lines



Host Bus Adapters

Celerity™ Fibre Channel HBAs and ExpressSAS® SAS/SATA HBAs adapters provide faster and more efficient data transfers.



Network Interface Cards

FastFrame™ 10/25/40/50/100 Gb Smart Ethernet NICs provide flexible and scalable unified LAN and SAN storage connectivity.



intelligent Bridges

XstreamCORE® Ethernet and Fibre Channel intelligent bridges disaggregate storage from compute by enabling remote access and sharing of flash, disk, tape and optical media.



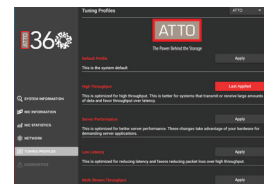
SiliconDisk™

SiliconDisk is a scalable, state-of-the-art RAM-based storage appliance that delivers faster performance than flash-based SSD storage solutions, and with much lower latency.



Thunderbolt™ Adapters

ThunderLink® adapters enable high-performance, low latency Thunderbolt connectivity to desktop and mobile workstations for storage and network connectivity.



Software

ATTO software and downloadable tools help to maximize the productivity of a number of ATTO products.

Technology Leadership

Technology at its fastest

ATTO Advanced Data Streaming (ADS™) Technology

ATTO ADS is proprietary latency management technology built into all ATTO network and storage connectivity solutions. ADS works transparently to smooth data transfers through controlled acceleration. Data moves more efficiently as a result, giving ATTO users an unmistakable edge in total system performance.

From high I/O transactions to large bandwidth real-time streaming, ADS reduces interruptions and maximizes the amount of data processed per CPU cycle.

Featured Products:

- ATTO Celerity™ Fibre Channel host bus adapters (HBAs)
- ATTO ExpressSAS® SAS/SATA HBAs
- ATTO FastFrame™ Ethernet Smart NICs
- ATTO ThunderLink® Thunderbolt™ adapters

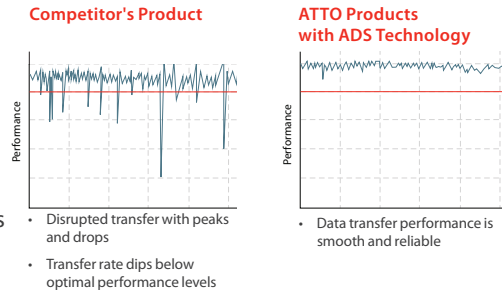
ATTO MultiPath Director™

This specialized driver recognizes and takes advantage of all paths within a Fibre Channel storage network. When connected to enterprise-class storage systems, data is moved across multiple paths ensuring it is available for anyone who needs it, when they need it.

ATTO MultiPath Director enables failover and load balancing capabilities for high-availability storage. Load balancing across multiple paths increases overall system performance. It also can mix Windows®, macOS® and Linux® workstations in a heterogeneous environment.

Featured Products:

- ATTO Celerity Fibre Channel host bus adapters
- ATTO ThunderLink Thunderbolt adapters



ATTO xCORE™ Hardware Acceleration Processor eCORE™ Offload Processor

Working together, xCORE and eCORE unleash the full potential of software defined storage, making it possible to add common, open storage services and industry standard API integration and maximize the gains of all-flash storage architectures.

xCORE Data Acceleration manages the data path and assures that all reads and writes are processed as fast as possible. xCORE is a key ATTO technology that enables low latency data transfers.

eCORE Control Engine manages the control path so XstreamCORE can handle all non-data requests from the host and process them in the background while xCORE handles data transfers.

Featured Products:

- ATTO XstreamCORE® intelligent Bridge
- ATTO SiliconDisk™ RAM-based Storage Appliance

ATTO PowerCenter Pro™

A software interface built into ATTO 12 Gb/s ExpressSAS SAS/SATA HBAs and ATTO ThunderLink Thunderbolt adapters. ATTO PowerCenter Pro™ adds RAID functionality, protection and performance without the need or cost of additional hardware RAID components.

Supports RAID 0, 1, 1e or 10 via integrated software and features a simple, fully scriptable “set it and forget it” CLI and EFI interface for RAID group creation, monitoring and management. Provides full boot support as well as support for hot spares.

Easy-to-use, powerful, yet lightweight, ATTO PowerCenter Pro software provides the protection, capacity expansion and performance improvements needed for today's SSD storage platforms.

Featured Products:

- ATTO ExpressSAS SAS/SATA host bus adapters
- ATTO ThunderLink Thunderbolt adapters

32Gb,16Gb and 8Gb Fibre Channel HBAs

ATTO Celerity™ Host Bus Adapters

ATTO Celerity™ Fibre Channel host bus adapters (HBAs) are designed to cover the full performance spectrum from enterprise to workgroup and server to workstation environments. This highly integrated, fully scalable family of adapters is engineered to optimize data transfer using a combination of features that enhance the data delivery process and is fully scalable. ATTO Celerity 32, 16 Gb and 8Gb single, dual and quad channel HBAs further enhance speed and reliability in high-bandwidth work environments. Celerity HBAs address the need for high-performing, scalable and secure storage to support exponential data growth. With features including forward error correction, the Celerity portfolio ensures high reliability in demanding high-speed networks. Built for the latest computer interface, Fibre Channel host adapters are compatible with all Fibre Channel 32, 16, and 8Gb devices.

- PCIe 4.0 Gen 4 support for next generation performance
- Optimized for extremely low latency and high-bandwidth transfers
- Engineered to meet today's high-performance applications, servers and SSD demands .
- Designed to support real-time virtual environments resulting in higher application performance, better transaction processing and the ability to handle larger workloads
- Enterprise storage-ready compatible with major storage vendors
- ATTO MultiPath Director™ is the industry's only solution that allows servers and workstations access to high-availability, high-performance, enterprise-class storage for shared workflows

Supports:

- Linux®, macOS®, Windows®, Windows Server Hyper-V®, VMware®, FreeBSD, illumos
- Direct fabric/switch attach and point-to-point
- Certified with industry leading platforms and applications
- N-Port ID Virtualization and Virtual Fabric
- Initiator and Target Mode support

Includes:

- ATTO Advanced Data Streaming (ADS™) Technology
- Pluggable optical SFP+ included
- ATTO ConfigTool™ for customized performance settings

Complementary Products:

- ATTO XstreamCORE®
- ATTO ThunderLink® adapters
- ATTO premium cables

ATTO Celerity™ 32Gb Gen 7 PCIe 4 Fibre Channel Host Bus Adapters

Product Features	FC-324P	FC-322P	FC-321P
Part Number	CTFC-324P-000	CTFC-322P-000	CTFC-321P-000
Fibre Channel Ports	4	2	1
Max. Transfer Rate	12800MB/s	6400MB/s	3200MB/s
Bus Type	PCIe 3.0 x16	PCIe 4.0 x8	PCIe 4.0 x8
Auto Negotiation	32Gb, 16Gb, 8Gb	32Gb, 16Gb, 8Gb	32Gb, 16Gb, 8Gb
Connector Type	Optical SFP+ LC	Optical SFP+ LC	Optical SFP+ LC
Low-Profile Form Factor	No	Yes	Yes
Developer's Kit ¹ (Target Mode API)	Yes	Yes	Yes
Warranty	3 year	3 year	3 year

ATTO Celerity™ 32Gb Gen 6 Fibre Channel Host Bus Adapters

Product Features	FC-324E	FC-322E	FC-321E
Part Number	CTFC-324E-000	CTFC-322E-000	CTFC-321E-000
Fibre Channel Ports	4	2	1
Max. Transfer Rate	12800MB/s	6400MB/s	3200MB/s
Bus Type	PCIe 3.0 x16	PCIe 3.0 x8	PCIe 3.0 x8
Auto Negotiation	32Gb, 16Gb, 8Gb	32Gb, 16Gb, 8Gb	32Gb, 16Gb, 8Gb
Connector Type	Optical SFP+ LC	Optical SFP+ LC	Optical SFP+ LC
Low-Profile Form Factor	No	Yes	Yes
Developer's Kit ¹ (Target Mode API)	Yes	Yes	Yes
Warranty	3 year	3 year	3 year

ATTO Celerity™ 16Gb Gen 6 Fibre Channel Host Bus Adapters

Product Features	FC-164P	FC-162P	FC-161P
Part Number	CTFC-164P-000	CTFC-162P-000	CTFC-161P-000
Fibre Channel Ports	4	2	1
Max. Transfer Rate	6400MB/s	3200MB/s	1600MB/s
Bus Type	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Auto Negotiation	16Gb, 8Gb, 4Gb	16Gb, 8Gb, 4Gb	16Gb, 8Gb, 4Gb
Connector Type	Optical SFP+ LC	Optical SFP+ LC	Optical SFP+ LC
Low-Profile Form Factor	Yes	Yes	Yes
Developer's Kit ¹ (Target Mode API)	Yes	Yes	Yes
Warranty	3 year	3 year	3 year

ATTO Celerity™ 8Gb Fibre Channel Host Bus Adapters

Product Features	FC-84EN	FC-82EN	FC-81EN
Part Number	CTFC-84EN-000	CTFC-82EN-000	CTFC-81EN-000
Fibre Channel Ports	4	2	1
Max. Transfer Rate	3200MB/s	1600MB/s	800MB/s
Bus Type	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8

[1] Available for qualified OEM sales only. Please contact your ATTO representative.
Compatible intelligent bridge available - see page 10.
Compatible software available - see page 16.
Compatible cables & accessories available.

ATTO
Technology

HBAs
Fibre Channel

NICs

Intelligent
Bridges

SiliconDisk

Thunderbolt™
Adapters

Software &
Management

12Gb SAS/SATA HBAs

ATTO ExpressSAS® Host Bus Adapters

ATTO ExpressSAS® host bus adapters (HBAs) leverage the performance and scalability enhancements of serial attached SCSI (SAS) technology to deliver the fastest available connection to SAS/SATA storage. They offer a reliable direct-attached storage connectivity solution that is interoperable with a wide range of internal and external disk and tape products. ExpressSAS 12Gb SAS/SATA HBAs feature PCI Express 4.0 bus technology in a low-profile form factor with miniSAS HD connectors for improved cable management and monitoring.

- PCIe 4.0 Gen 4 support for next generation performance
- Optimized for extremely low latency and high-bandwidth transfers for both data-intensive and high-transaction rate applications
- Compatible with all major SAS/SATA solid-state disk, hard disk and tape drives
- Low power consumption expands system performance resources and extends processing capabilities
- Integrated software RAID support via PowerCenter Pro™

Supports:

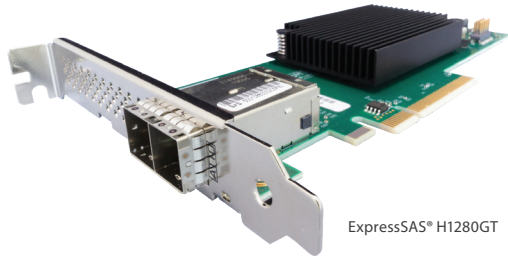
- macOS®, Windows®, Linux®, VMware®, FreeBSD®, illumos
- PowerCenter Pro RAID 0, 1, 10, 1e
- Up to 2048 end point devices
- Certified with industry leading platforms and applications
- Initiator and Target Mode support

Includes:

- ATTO Advanced Data Streaming (ADS™) Technology
- ATTO ConfigTool™ for customized performance settings
- ATTO WriteStop™ technology for data security in digital forensic applications

Complementary Products:

- ATTO ThunderLink® adapters
- ATTO premium cables



ATTO ExpressSAS® HBAs are available with a wide selection of port options to support varying connections to storage from servers and workstations in datacenters, data warehousing, video on demand and other high availability, high performance applications.

ATTO ExpressSAS® SAS/SATA Host Bus Adapters

Product Features	H12F0 GT	H120F GT	H1280 GT	H1208 GT	H1244 GT
Part Number	ESAH-12F0-000	ESAH-120F-000	ESAH-1280-000	ESAH-1208-000	ESAH-1244-000
Port Config. (Ext./Int)	16/0	0/16	8/0	0/8	4/4
Bus Type ¹	PCIe 4.0 x8	PCIe 4.0 x8	PCIe 4.0 x8	PCIe 4.0 x8	PCIe 4.0 x8
Connector Type	(4) 12Gb mini SAS HD (x4) SFF 8644 External	(4) 12Gb mini SAS HD (x4) SFF 8643 Internal	(2) 12Gb mini SAS HD (x4) SFF 8644 External	(2) 12Gb mini SAS HD (x4) SFF 8643 Internal	(1) 12Gb miniSAS HD (x4) SFF 8644 External (1) 12Gb miniSAS HD (x4) SFF 8643 Internal
Low-Profile Form Factor	Yes	Yes	Yes	Yes	Yes
Developer's Kit ² (Target Mode)	Yes	Yes	Yes	Yes	Yes
Warranty	3 year	3 year	3 year	3 year	3 year

Product Features	H12F0	H120F	H1280	H1208	H1244	H1288
Part Number	ESAH-12F0-000	ESAH-120F-000	ESAH-1280-000	ESAH-1208-000	ESAH-1244-000	ESAH-1288-000
Port Config. (Ext./Int)	16/0	0/16	8/0	0/8	4/4	8/8
Bus Type	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Connector Type	(4) 12Gb mini SAS HD (x4) SFF 8644 External	(4) 12Gb mini SAS HD (x4) SFF 8643 Internal	(2) 12Gb mini SAS HD (x4) SFF 8644 External	(2) 12Gb mini SAS HD (x4) SFF 8643 Internal	(1) 12Gb miniSAS HD (x4) SFF 8644 External (1) 12Gb miniSAS HD (x4) SFF 8643 Internal	(2) 12Gb miniSAS HD (x4) SFF 8644 External (2) 12Gb miniSAS HD (x4) SFF 8643 Internal
Low-Profile Form Factor	Yes	Yes	Yes	Yes	Yes	Yes
Developer's Kit ² (Target Mode)	Yes	Yes	Yes	Yes	Yes	Yes
Warranty	3 year	3 year	3 year	3 year	3 year	3 year

¹ Cross-compatible with PCIe 3.0

² Available for qualified OEM sales only. Please contact your ATTO representative. Compatible software available - see page 16. Compatible cables available.

ATTO Technology

HBAS SAS/SATA

NICs

Intelligent Bridges

SiliconDisk

Thunderbolt™ Adapters

Software & Management

10/25/40/50/100 Gigabit Ethernet Adapters

ATTO FastFrame™ Smart Network Interface Cards (NICs)

ATTO FastFrame™ smart network interface cards provide unmatched performance, industry-lowest latency and the versatility needed to support the most demanding and complex ecosystems. Supporting line speeds of up to 100GbE and latency as low as 1µs, FastFrame NICs are suitable for media & entertainment applications such as video post-production, finishing, imaging, archiving and workgroup file sharing, as well as IT applications such as data analytics, high performance computing (HPC) clusters, hyperconverged servers and large database analysis.

ATTO uses the latest technology to accelerate data I/O and deliver industry-leading performance. With end-to-end Quality of Service algorithms built in, network congestion is greatly reduced even over long distances. FastFrame have built-in hardware offload engines, including CPU transport layer offload and NVMe over Fabric target offload to accelerate data and reduce server overhead.

In addition to FastFrame, we offer a full line of legacy NICs, that provide end-to-end connectivity options for the most cost-effective and flexible network solutions.

- ATTO 360™ performance tuning, monitoring, and analytics application offers comprehensive tools that unlock the full potential of FastFrame NICs.
- FastFrame NICs leverage ATTO Advanced Data Streaming (ADS™) Technology to provide high-bandwidth and managed latency for high-performance, enterprise-level storage as well as standard network infrastructures.
- FastFrame cards support “energy efficient Ethernet” and are up to 30% more energy efficient than competitive products.
- Available in a variety of port configurations, including single, dual, and quad channel options.

Supports:

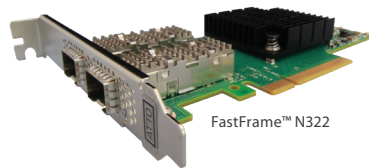
- macOS®, Windows®, Linux®, FreeBSD, VMware® and illumos
- Smart Offloads for TCP and NVMe-oF
- Accelerated RDMA/RoCE and iSER Support
- iSCSI initiator software (optional)
- Certified with industry leading platforms and applications
- NVMe over Fabrics

Includes:

- ATTO 360™ Tuning, monitoring and analytics application
- ATTO Advanced Data Streaming (ADS™) Technology
- Pluggable optical SFP+/QSFP+/QSFP28/SFP 28 support

Complementary Products:

- ATTO ThunderLink® adapters
- ATTO XstreamCORE® intelligent bridge
- ATTO XtendSAN™ iSCSI initiator
- ATTO premium cables



FastFrame™ N322

Based on industry-standard Ethernet technology, ATTO FastFrame™ Smart NICs are available in single, dual, and quad-port configurations.

ATTO FastFrame™ 3 Optical Network Interface Cards

Product Features	N351	N352	N322	N311	N312
Part Number	FFRM-N351-DA0	FFRM-N352-DA0	FFRM-N322-DA0	FFRM-N311-DA0	FFRM-N312-DA0
Max. Data Rate	50Gb/s	50Gb/s	25Gb/s	100Gb/s	100Gb/s
Supported Speeds	1/10/25/40/50 Gb/s	1/10/25/40/50 Gb/s	1/10/25 Gb/s	1/10/25/40/50/100 Gb/s	1/10/25/40/50/100 Gb/s
Bus Type	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x16	PCIe 3.0 x16
Connector Type	QSFP28	QSFP28	SFP28	QSFP28	QSFP28
Low-Profile Form Factor	Yes	Yes	Yes	Yes	Yes
Warranty	3 year	3 year	3 year	3 year	3 year

ATTO FastFrame™ Optical Smart NICs

Product Features	NS12
Part Number	FFRM-NS12-000
10GbE Ports	2
Max. Data Rate	10Gb/s
Bus Type	PCIe 2.0 ¹ x8
Connector Type	Optical SFP+ LC
Low-Profile Form Factor	Yes
Warranty	3 year

ATTO FastFrame™ 10GBASE-T NICs

Product Features	NT12
Part Number	FFRM-NT12-000
10GbE Ports	2
Max. Data Rate	10Gb/s
Bus Type	PCIe 2.0 ¹ x8
Connector Type	RJ45
Low-Profile Form Factor	Yes
Warranty	3 year

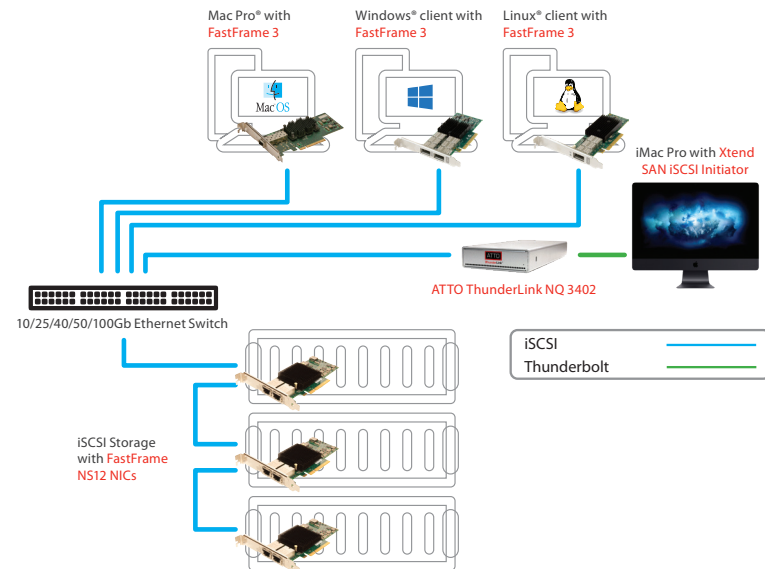
¹ Cross-compatible with PCIe 3.0

Compatible software available - see page 16.

Compatible cables available.

ATTO Xtend SAN™ iSCSI Initiator

ATTO Xtend SAN iSCSI Initiator for Mac systems enables macOS® users to have a reliable, secure, highly interoperable connection to any iSCSI storage. iSCSI allows users to take advantage of an existing Ethernet infrastructure while reaping the benefits of network attached storage.



ATTO Technology

HBAs

NICs Ethernet

Intelligent Bridges

SiliconDisk

Thunderbolt™ Adapters

Software & Management

intelligent Bridges

ATTO XstreamCORE® Fibre Channel or Ethernet to SAS intelligent Bridge

ATTO XstreamCORE® intelligent bridges are high-performance, accelerated conversion appliances that enable SAS storage to reach longer distances and connect to up to 64 hosts. XstreamCORE enables the disaggregation of storage from server hardware adding JBOD, JBOF, RAID or tape storage. Use cases include creating connection points from drives to space-limited rack or blade servers, adding shared management capabilities to direct-attached storage, disaggregating storage into shared, remote pools, as well as locating direct-attached SAS disk or tape devices over Ethernet or Fibre Channel.

- ATTO intelligent bridge keeps overall storage solutions flexible without locking users into proprietary hardware implementations. ATTO intelligent bridges are a modular building block with technology that allows admins to reduce resource load while decoupling storage from server resources.
- Optimized for high-performance with ATTO xCORE™ Data Acceleration, XstreamCORE provides deterministic performance for up to 64 hosts with less than two microseconds of added latency. Users will benefit from very high, reliable throughput and IOPS.
- ATTO eCORE™ offload processor adds common services and features, integrates with open storage services, APIs and offloads non-data I/O to maintain consistent performance.

Supports:

- Full-duplex data transfers
- Error recovery
- Certified with industry leading platforms and applications
- Data Mover functionality
- VMware® Ready

Includes:

- ATTO xCORE Data Acceleration Processor
- ATTO eCORE Offload Processor
- Parallel Data Processing
- Pluggable optical SFP+/QSFP+ modules
- In and out of band management of XstreamCORE functions

Complementary Products:

- ATTO Celerity™ Fibre Channel HBAs
- ATTO FastFrame™ Ethernet NICs
- ATTO ThunderLink® adapters



XstreamCORE FC 7600



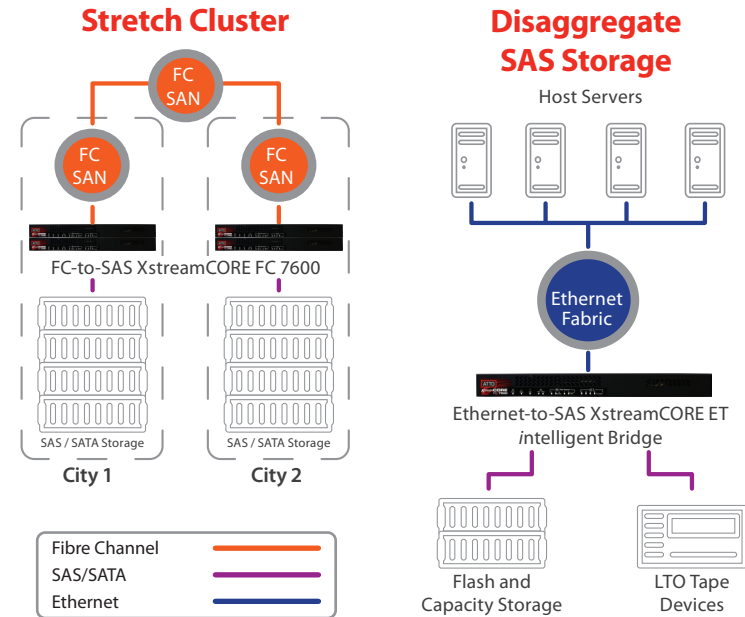
"ATTO XstreamCORE® FC 7550 has allowed Torcon the flexibility to expand our storage without having to completely re-architect the current setup."

– Shawn Winters
Director of Technology, Torcon

ATTO XstreamCORE® Fibre Channel and Ethernet intelligent bridge

Product Features	8200 / 8200T	7600	7550
Part Number	XCET-8200-002 / XCET-8200-TP2	XFC-7600-002	XFC-7550-004
Max Sustained Transfer Rate	6000 MB/s (iSER)	6000 MB/s	6000 MB/s
4K IOPS	1,100,000	1,100,000	1,100,000
Input Connectors	(2) 40Gb Ethernet QSFP+ (iSER / iSCSI support)	(2) 32Gb Fibre Channel SFP+	(4) 16Gb Fibre Channel SFP+
Output Connectors	(4) 12Gb HD Mini SAS (x4) SFF 8644	(4) 12Gb HD Mini SAS (x4) SFF 8644	(4) 12Gb HD Mini SAS (x4) SFF 8644
Management Ports	RS-232/RJ45/USB	RS-232/RJ45	RS-232/RJ45
In Band/Out of Band Management	Yes	Yes	Yes
xCORE Data Acceleration	Yes	Yes	Yes
eCORE Offload	Yes	Yes	Yes
Data Mover Support	Yes	Yes	Yes
Devices supported	Up to 960	Up to 960	Up to 960
Active initiator Support	64	64	64
Event Log Protection	NVRAM	NVRAM	NVRAM
Expander/Port Multiplier support	Yes	Yes	Yes
Form Factor	1U Rackmount	1U Rackmount	1U Rackmount
Power Supplies	Dual Hot Swap	Dual Hot Swap	Dual Hot Swap
Disk Support	Yes (8200 only)	Yes	Yes
Tape Support	Yes	Yes	Yes
Warranty	2 year	2 year	2 year

Compatible cables and accessories available.



ATTO Technology

HBAs

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Intelligent Bridges

SiliconDisk

Thunderbolt™ Adapters

Software & Management

SiliconDisk™

ATTO SiliconDisk RAM-based Storage Appliance

ATTO SiliconDisk™ changes the way enterprise architects design for the ultimate performance in storage solutions. With just nanosecond latency and four 100Gb Ethernet ports for 400Gb of bandwidth, SiliconDisk storage blows away current SSD solutions for performance.

With guaranteed latency in a shared ethernet fabric, ATTO SiliconDisk is the next step in the evolution of storage and will change the way your applications store and use data. Data is instantly stored and retrieved with incredible speed letting you edit more streams of video, capture more data instances for AI / ML, manipulate more data sets quicker, and provides incredible performance to index look-ups.

Features:

- 6.4M 4k IOPS
- 35GB/sec sustained throughput
- (4) 100GbE ports
- Predictable latency of <600 nanoseconds
- Full NVME-oF RoCE v2 support
- Direct attach or Fabric connectivity
- 1U rackmount - Enterprise ready!

Performance levels are unparalleled with up to 6.4M 4K IOPS and throughput of up to 35 GBytes per second. Access times at 4K block sizes is deterministic and consistent with a latency of fewer than 600 nanoseconds. Additionally, ATTO SiliconDisk features technology that eliminates the small write penalties or latency gaps often seen on SSD type devices.

Deficiencies in write endurance have made using traditional SSD storage solutions in mission critical applications difficult. Device writes per day, or DWPD, is an endurance calculation that NAND flash products use to predict when the device will become unreliable. RAM Memory in ATTO SiliconDisk™ has no “per write” flash performance penalties or worry of memory wear-out.

By moving RAM-level storage data externally to a shared fabric for high availability configurations every node can have easy access to share that data. Should cluster node failures occur, another node can have quick access to that data for better resiliency. System architects can re-imagine their solution to add n-1 performance models using additional nodes for better overall performance. And for composability, ATTO SiliconDisk can be scaled up or down and reassigned on demand.



ATTO SiliconDisk™ RAM-based Storage Appliance

Product Features

Part Number	SDSK-0512-000	SDSK-1024-000
*Capacity	512 GB	1024 GB
4K IOPS	6,400,000 IOPS	6,400,000 IOPS
Latency	<600ns	<1ms
Bandwidth	35 GBytes/s	35 GBytes/s
Input Connectors	(4) 100GbE	(4) 100GbE
Insight Analytics	Yes	Yes
Infinite Write Endurance™	Yes	Yes
xCORE Data Acceleration	Yes	Yes
eCORE Offload	Yes	Yes
Form Factor	1U Rackmount/ Desktop	1U Rackmount/ Desktop
Power Supply	Dual Hot Swap	Dual Hot Swap
Warranty	3 year	3 year

* For larger capacities, please contact ATTO

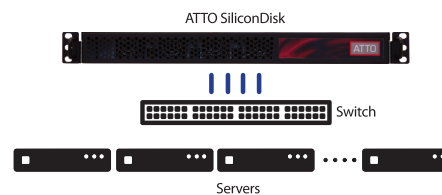
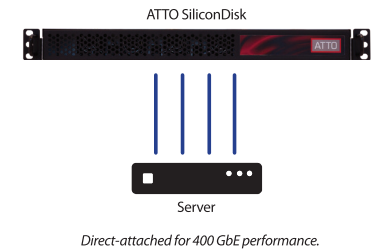
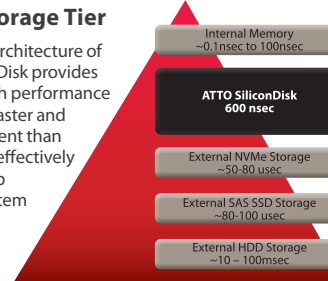
ATTO Insight Analytics™ application delivers real-time performance analytics on your storage network connections, storage utilization as well as overall SiliconDisk data performance allowing you to quickly assess issues and optimize your solution. Analytics capabilities are hardware-based, allowing users to dig deep without impacting system performance.

Applications

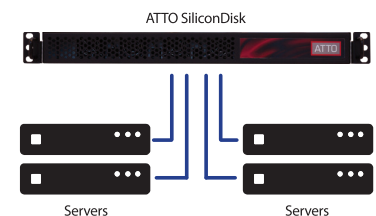
- Financial Data Analysis
- Workgroup & Cloud Architectures
- Artificial Intelligence/Machine Learning
- Imaging and Rendering
- Database Indexes
- Parallel Computing Environments
- Server Clusters
- Composable Infrastructures

A New Storage Tier

The unique architecture of ATTO SiliconDisk provides breakthrough performance that is both faster and more consistent than SSD storage effectively filling the gap between system memory and the first tier of JBODs.



Fabric-attached for greater scalability.



Switch-less direct-connect server configuration.

ATTO Technology

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Thunderbolt™ Adapters

ATTO ThunderLink® Adapters

Delivering creative, engineering and technical professionals a high-performance and low latency Thunderbolt™ connectivity solution engineered for applications where optimized performance and high throughput are essential. ATTO ThunderLink® adapters allow today's Thunderbolt enabled desktop and mobile workstations to connect into high-performance storage or networks. ATTO provides the widest portfolio of Fibre Channel, Ethernet and SAS/SATA adapters.

- Purpose built to be low profile, cool, ultra-quiet and simple to deploy into existing environments
- All units are equipped with any needed SFP+/QSFP+/ SFP28 locking power supply and Kensington™ security slot
- Widest portfolio available of tested and certified solution components including storage systems, switches, hosts and software applications



ATTO ThunderLink®

Supports:

- macOS®, Windows®, VMware® vSphere
- Certified with industry leading platforms and applications

Includes:

- ATTO Advanced Data Streaming (ADS™) Technology
- ATTO ConfigTool™ for customized performance settings
- ATTO MultiPath Director™
- ATTO 360™

Complementary Products:

- ATTO Celerity™ Fibre Channel HBAs
- ATTO ExpressSAS® HBAs
- ATTO FastFrame™ NICs
- ATTO XstreamCORE® intelligent bridge
- ATTO premium cables and accessories

"With Thunderbolt Macs, you can't put a Fibre Channel card in, so ATTO ThunderLink® adapters ended up being really crucial for both moving material around, and doing a conform and grade."

– Marcus Von Holtzendorff
Mel Hoppenheim School of Cinemas

ATTO ThunderLink® Adapters - Thunderbolt 3

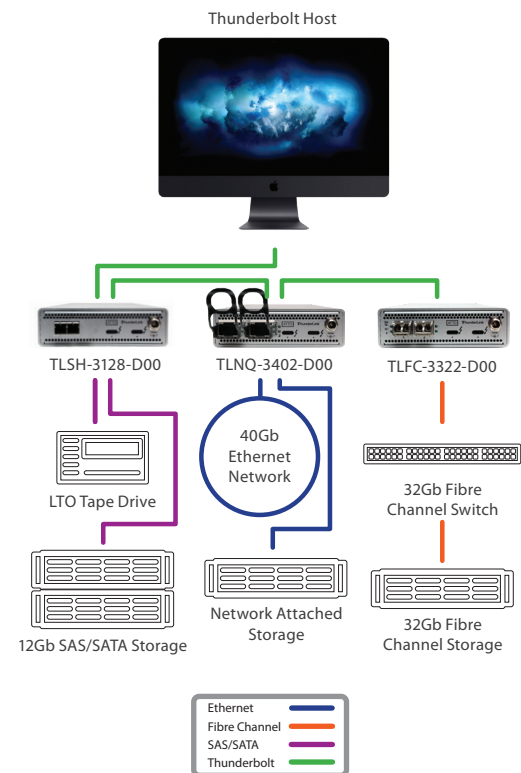
Product Features	40GbE	25GbE	10GbE	10GbE
Part Number	TLNQ-3402-D00/DE0 ¹	TLNS-3252-D00/DE0	TLN3-3102-D00/DE0	TLN3-3102-T00/TE0
Input Connectors	(2) 40Gb/s Thunderbolt 3 (USB-C)	(2) 40Gb/s Thunderbolt 3 (USB-C)	(2) 40Gb/s Thunderbolt 3 (USB-C)	(2) 40Gb/s Thunderbolt 3 (USB-C)
Output Connectors	(2) 40GbE	(2) 25GbE	(2) 10GbE	(2) 10GbE
Connector Type	(2) QSFP+ (Included)	(2) Optical SFP+28 (Included)	(2) Optical SFP+LC (Included)	(2) RJ45 SFP+ (Included)
Warranty	3 year	3 year	3 year	3 year

ATTO ThunderLink® Adapters - Thunderbolt 3

Product Features	SAS/SATA	Fibre Channel	Fibre Channel
Part Number	TLSH-3128-D00/DE0	TLFC-3322-D00/DE0	TLFC-3162-D00/DE0
Input Connectors	(2) 40Gb/s Thunderbolt 3 (USB-C)	(2) 40Gb/s Thunderbolt 3 (USB-C)	(2) 40Gb/s Thunderbolt 3 (USB-C)
Output Connectors	(2) 12Gb SAS/SATA	(2) 32Gb/s Fibre Channel	(2) 16Gb/s Fibre Channel
Connector Type	(2) mini SAS (x4) SFF 8644 External	(2) Optical SFP+LC (Included)	(2) Optical SFP+LC (Included)
Warranty	3 year	3 year	3 year

¹ Includes UK/EMEA power components, accessories
Compatible cables and accessories available.

Use Case



Software and Management

ATTO Xtend SAN™ and Disk Benchmark

ATTO Xtend SAN™ iSCSI Initiator for macOS® software connects workstations with built-in Ethernet to multiple direct-attached storage servers across long distances. It provides users network access to block-level storage without the cost and complexity of a Fibre Channel SAN. With iSCSI, small businesses and workgroups gain the advantages of a SAN on a manageable budget.

- Easy setup and management features make implementing an iSCSI SAN simple
- High performance for demanding applications
- Volume and enterprise licensing available

ATTO Disk Benchmark is the world's most widely used performance measurement tool. Measure your storage system performance with various transfer sizes and test lengths for reads and writes. Several options are available to customize your measurement including a comparison mode to analyze various performance tests. Use ATTO Disk Benchmark to test HDD and SSD drives and to tune for maximum performance.

- Transfer sizes from 512KB to 8MB
- Transfer lengths from 64KB to 2GB
- Support for overlapped I/O
- Supports a variety of queue depths

Supports:

- Up to 1024 targets
- Header/Data digest with class 1 error recovery
- SNS client login redirect function
- CHAP iSCSI security
- iSNS client
- Certified with industry leading platforms and applications

Includes:

- Easy-to-use GUI simplifies set-up, configuration and management
- Advanced CLI for addressing iSCSI targets
- Voluming Licensing available

Complementary Products:

- ATTO FastFrame™ NICs
- ATTO ThunderLink® adapters



ATTO Disk Benchmark for macOS

Visit atto.com to find the right software to maximize the performance of your storage connection.

Management Tools

ATTO ConfigTool™, vConfigTool™ and ATTO 360™

ATTO ConfigTool™ helps customize the settings of your ATTO host bus adapter (HBA) to maximize the performance of your storage connection. ConfigTool comes standard with all ATTO HBAs and Thunderbolt™ adapters.

- Custom utility settings to optimize performance
- Available on macOS®, Windows® and Linux®
- Advanced troubleshooting and monitoring

ATTO vConfigTool™ for VMware® vCenter Server is a software plug-in that integrates centralized management and monitoring of ATTO Celerity™ and ATTO ExpressSAS® host bus adapters into VMware virtual environments. This accelerates adapter deployments, optimizes configurations, improves system availability. vConfigTool includes ATTO Latency Scout™, an I/O latency statistic feature that enables IT administrators to monitor storage I/O latency and isolate bottlenecks.

- Custom utility settings to optimize performance
- Advanced troubleshooting and monitoring

ATTO 360™ Ethernet Tuning, Monitoring, and Analytics software unlocks the true potential of ATTO FastFrame™ and ATTO ThunderLink® Ethernet products for macOS®, Windows® and Linux®. This unique application allows you to tune Ethernet for performance as well as diagnose performance and connection issues behind a simple, easy to use management interface. Being undeterministic by nature, Ethernet requires qualified technical resources to understand network topology, identify obstacles to proper data flow, and tuning for optimal performance.



- Performance tuning for ATTO Smart NICs with 1-click setup for specific use cases and workflows including custom tuning profiles for partners like Dell, Avid, and Autodesk.
- Diagnose common issues that cause poor performance and take corrective actions to fix problems before they occur.
- Monitor all Ethernet traffic and run packet statistics.
- Manage driver settings, MTU sizes, buffers, flow control and several offloads from one convenient and easy to use management interface.

ATTO Technology

HBAs

NICs

Intelligent Bridges

SiliconDisk

Thunderbolt™ Adapters

Software & Management