



ATTO

ATTO

ATTO Technology, Inc.

Corporate Overview

For over 25 years, ATTO has been an innovator in storage and network 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.

- Enterprise - Database, Web Servers, Back-Office Operations
- Departmental - Business Analytics, Supply Chain, Asset Management
- Workgroup - CAD/CAE, Video Production, Scientific, Energy, Medical

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

- Fibre Channel, SAS/SATA, iSCSI, 10GbE, FCoE, Thunderbolt™
- HBAs, RAID Adapters, NICs, CNAs, Storage Controllers, Bridges, Switches, Desklink Devices, Software

ATTO provides tested solutions qualified and certified with the industry leading workstation, server, storage and application vendors.

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

**A unique level of partnership
with customers, solution providers and OEMs**



ATTO Founders
Dave Snell, CTO & Tim Klein, CEO

Powering the World's Networks and Storage



Always Have the Latest Edition

See the newest additions to the ATTO product portfolio by scanning the QR code or visiting <http://www.attotech.com/ResourceGuide/>



Host Bus & RAID Adapters

Celerity™ 16Gb/s and 8Gb/s Fibre Channel HBAs, ExpressSAS™ 12Gb/s and 6Gb/s SAS/SATA HBAs and RAID Adapters provide faster and more efficient data transfers



Converged Network Adapters & Network Interface Cards

FastFrame™ 40 Gb & 10Gb CNAs and NICs provide flexible and scalable unified LAN and SAN storage connectivity



Desklink Devices

ThunderLink™ and ThunderStream™ Desklink Devices enable high-performance, low latency capabilities to all-in-one systems, laptops and integrated computers for storage and network connectivity



Storage Controllers

ATTO FibreBridge™ Fibre Channel storage controllers integrate direct attached SAS/SATA storage into Fibre Channel SANs



Switches

FibreConnect™ 16 & 8Gb/s Fibre Channel switches provide high-performance, scalable connectivity with enterprise-level features for small to mid-range SANs



Software

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



Cables and Accessories

ATTO high quality cables maximize product performance and data integrity

HBAs

RAID Adapters

NICs/CNAs

ATTO Solutions

Desklink Devices

Storage Controllers

Switches

Software

Cables

"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.

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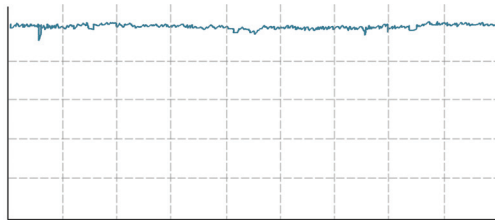
Technology Leadership

ATTO Product Differentiators

Advanced Data Streaming (ADS™)

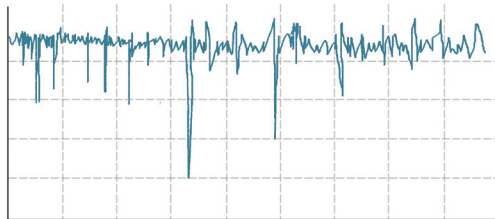
ADS latency management technology is built into every ATTO host bus adapter (HBA) and RAID controller, providing the fastest, most consistent time-to-data, delivering the best-in-industry aggregate bandwidth and predictable data transfers for high performance applications.

ATTO Products with ADS™ Technology



Data transfer performance is smooth and reliable

Competitor's Product



Disrupted transfer with peaks and drops

Transfer rate dips below optimal performance levels

ATTO's heritage of pioneering solid-state storage technology means that all products are engineered to manage latency in real-time environments:

- Higher application performance = improved productivity
- Better transaction processing = faster time to revenue & critical business decisions
- Ability to handle larger workloads & client counts

Adaptive Path Optimization

Intelligently senses multiple paths to drives and increases I/O for up to a 70% performance improvement. Also eliminates single points of failure in storage connections.

CacheAssure™

Uses supercap technology to protect cached data for up to 10 years. Manages data during power up and power down. Eliminates battery-related maintenance, reducing IT costs.

Drive Map Director™

Provides a logical, static topology and enables login parameters, access management and security for racks of SAS/SATA storage during configuration or maintenance, reducing additional administration costs and resources.

DriveAssure™

Repairs drives to prevent premature failures and slowdowns to maximize system uptime. Also ensures 100% throughput during data rebuilds.

DVRAID™

Technology optimized for digital content creation environments which require protection in the event of a disk failure without the performance penalty traditionally seen with parity RAID.

Intelligent Controller Architecture™

Combines powerful hardware with an efficient data engine to create a platform that delivers performance with a rapid IO ramp and extremely low latency.

MultiPath Director™

A proprietary technology available on ATTO's Fibre Channel host bus adapters and Desklink devices that enables Linux®, Mac® and Windows® workstations and servers to connect directly to enterprise-class storage with redundant controllers, providing failover and load balancing capabilities across multiple paths to the storage.

Optimized Device-Direct Transfer

Patented technology that pre-processes data and organizes command strings to allow for accelerated movement of data directly between storage devices in a SAN without the need for a server.

Pure Signal Integrity

ATTO products, including cables, are designed to minimize jitter, crosstalk, reflections and power supply noise, preventing data loss and maximizing data transfers.

Smooth Data Optimization™

Proprietary technology in ATTO's Power Center Software that accelerates transfer of data and manages latency across multiple drives.

Virtual Device Manager

Virtualizes devices in one protocol so they can be managed by a controller of a different protocol.

Virtual Drive Response (VDR)

Enables devices to queue and execute commands on behalf of busy or unresponsive tape storage, reducing the number of failed or incomplete backups.

WriteStop™

Ensures data security in digital forensics applications by blocking writes to hard disks, while providing read-only protection at the system level.

HBAs

RAID Adapters

NICs/CNAs

ATTO Solutions

Desklink Devices

Storage Controllers

Switches

Software

Cables

"ATTO is our go-to company for connectivity. We rely on the performance and reliability ATTO products provide, and use their products in all of our solutions."

-James McKenna, Vice-President, Marketing & Pre Sales, Facilis Technology, Inc.

Adaptive Path Optimization

Performance Plus Protection

ATTO's Adaptive Path Optimization has built-in intelligence to sense when multiple paths to drives are available and directs I/O accordingly. For the cost of a cable, you can see up to a 70% performance improvement. The ExpressSAS RAID adapter automatically configures and reconfigures for optimum I/O balance and is scalable to work with cascaded arrays and expanders.

Maximum Availability

Up to 2/3 of storage failures are caused by interconnect issues. Adaptive Path Optimization eliminates single points of failure in storage connections by creating redundant data paths. Fast, dynamic rebalancing minimizes disruptions and quickly restores a balanced configuration that delivers predictable access to data.

ATTO Products with Adaptive Path Optimization Technology - ExpressSAS SAS/SATA RAID Adapters and ThunderStream & ThunderLink Desklink Devices

CacheAssure™

No Batteries, Lifetime Backup

Power and system failures can cause data located in cache memory to become permanently lost. Traditionally, battery backup units (BBUs), which typically last 1 to 2 years, have been used to protect and recover cached data but they require constant monitoring, maintenance and replacement and only protect data for up to 72 hours after a failure. ATTO's RAID products with CacheAssure technology deliver a long-lasting and reliable cached data protection solution all without the worries associated with battery-based technology.

Zero Maintenance Data Protection

CacheAssure saves time and money by eliminating the need to install, monitor, maintain, dispose of and replace batteries. It provides protection within a few minutes of installation while batteries can take 6-8 hours to recharge, which can put data at risk. Contents in cache memory get saved immediately in the event of a system failure or power loss and can remain protected for up to 10 years. Unlike other solutions that transfer data immediately upon power restoration, CacheAssure ensures storage is back online before restoring and synchronizing data.

ATTO Products with CacheAssure Technology - ExpressSAS SAS/SATA RAID Adapters

"Extremely satisfied... we're noticing astronomical speed in transfer rates."

-Zoltan Kiraly, Senior SAN/Solutions Architect, Mercedes-Benz

DriveAssure™

Extend the Life of Your Drives

Studies show that up to 60% of IT budgets are spent on maintenance. DriveAssure searches for bad sectors or slow spots and repairs them without failing the drive, preventing the loss of critical assets and ensuring drives run longer, smoother and faster. Drives are groomed to effectively extend their useful life, reducing maintenance costs.

Maximize System Uptime

Fast access to, and rapid delivery of, data is critical in today's virtualized and "big data" environments. DriveAssure compensates for a slow drive in a RAID group to keep data moving smoothly within a guaranteed response time. In the event of a drive failure, the RAID group is rebuilt 50% faster than competitive solutions, all while providing 100% data delivery performance to the client.

ATTO Products with DriveAssure Technology - ExpressSAS SAS/SATA RAID Adapters and ThunderStream & ThunderLink Desklink Devices

MultiPath Director™

Enhancing High Performance Applications

Workstation-based applications in high-performance workgroup environments require fast throughput and uninterrupted access to data. In a typical workgroup setup, a server links workstations to storage with data residing on shared resources in a storage area network, or SAN — a configuration that adds latency, increases complexity and generally does not support the high performance level required by today's data-intensive workstation applications, like seismic exploration, scientific research, CAD/CAE, medical imaging and media production. The only other alternative is to use direct attached storage, an option that creates islands of unprotected data and makes it difficult to share projects.

Superior Performance

MultiPath Director solves performance problems by offering the unique option to bypass servers and connect Windows, Linux and Mac workstations directly to enterprise-class storage, providing a completely redundant, high-availability, high-performance storage solution for workstation applications. Redundant data paths with failover protection automatically route data to a secondary path in the event of a primary link, cable or switch failure, guaranteeing uninterrupted access for mission-critical applications. Load-balancing features use multiple paths to optimize data transfers, effectively eliminating bottlenecks that can drag down application performance. Load balancing and failover protection do not exist in most workstation operating systems. By incorporating these features at the driver level, ATTO provides the only solution that allows Windows, Linux, and Mac workstations to work together in a heterogenous SAN.

ATTO Products with MultiPath Director Technology - Celerity Fibre Channel HBAs and ThunderLink Desklink devices

16Gb & 8Gb Fibre Channel HBAs

Celerity™ Host Bus Adapters

Celerity Fibre Channel HBAs are designed to cover the full performance spectrum from enterprise to workgroup and server to workstation environments. This highly integrated 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's Celerity Gen 5 Powered 16Gb quad-channel HBAs, the first of their kind in the market, address the needs of Linux® and Windows® platforms in high performance computing, virtualization and other high IOP environments typically found in enterprise data centers. Built with the PCIe 3.0 computer interface, they are compatible and work seamlessly with all Fibre Channel 4, 8 and 16Gb devices.

- Optimized for extremely low latency and high-bandwidth transfers for both data-intensive and high-transaction rate applications
- Engineered to meet today's performance intensive applications, PCIe 3.0 servers and SSD demands with up to 1.2 million IOPS on a single port
- 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 Dell®, EMC®, HP®, Hitachi Data Systems, IBM®, NetApp®, Quantum® and other major storage vendors
- MultiPath Director™ is the industry's only solution to allow servers and workstations access to high-availability, high-performance, enterprise-class storage for shared workflows
- MultiPath Director™ implemented across all clients (servers and workstations) improves overall efficiency of the Fibre Channel SAN infrastructure
- Low power consumption expands system performance resources to extend processing capabilities
- Complete SAN connectivity solution when combined with an ATTO FibreConnect™ Fibre Channel Switch



FC-162E

Supports:

- Linux®, Mac®, Windows®, Windows Server Hyper-V®, VMware®
- Direct fabric/switch attach, point-to-point and arbitrated loop (16Gb only)
- Certified with industry leading platforms and applications

Includes:

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

Complementary Products:

- ATTO FibreBridge™ Fibre Channel Storage Controllers
- ATTO FibreConnect™ Fibre Channel Switches
- ATTO ThunderLink™ Desklink Devices
- ATTO premium cables

ATTO Celerity Host Bus Adapters

Product Features	164E ¹	162E	161E
Part Number	CTFC-164E-000	CTFC-162E-000	CTFC-161E-000
Fibre Channel Ports	4	2	1
Max. Data Rate	16Gb/s	16Gb/s	16Gb/s
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
Max. Cable Length (OM3)	150m - 8Gb 100m - 16Gb	150m - 8Gb 100m - 16Gb	150m - 8Gb 100m - 16Gb
Low-Profile Form Factor	—	Yes	Yes
Developer's Kit ¹ (Target Mode API)	Yes	Yes	Yes
Warranty	3 year	3 year	3 year

Product Features	84EN	82EN	81EN
Part Number	CTFC-84EN-000	CTFC-82EN-000	CTFC-81EN-000
Fibre Channel Ports	4	2	1
Max. Data Rate	8Gb/s	8Gb/s	8Gb/s
Max. Transfer Rate	3200MB/s	1600MB/s	800MB/s
Bus Type	PCIe 2.0 ² x8	PCIe 2.0 ² x8	PCIe 2.0 ² x8
Auto Negotiation	8Gb, 4Gb, 2Gb	8Gb, 4Gb, 2Gb	8Gb, 4Gb, 2Gb
Connector Type	Optical SFP+ LC	Optical SFP+ LC	Optical SFP+ LC
Max. Cable Length (OM3)	500m - 2Gb 380m - 4Gb 150m - 8Gb	500m - 2Gb 380m - 4Gb 150m - 8Gb	500m - 2Gb 380m - 4Gb 150m - 8Gb
Low-Profile Form Factor	—	Yes	Yes
Developer's Kit ¹ (Target Mode API)	Yes	Yes	Yes
Warranty	3 year	3 year	3 year

^[1] Available for qualified OEM sales only. Please contact your ATTO representative.

^[2] Cross-compatible with PCIe 3.0

Compatible Fibre Channel Switch Available - See Page 22.

Compatible Storage Controllers Available - See Page 20.

Compatible software available - see page 24.

Compatible cables & accessories available - see page 26.

MultiPath Director™

MultiPath Director™ is a proprietary driver available on ATTO's Fibre Channel host bus adapters and Desklink devices that enables Mac®, Windows® and Linux® workstations and servers to connect directly to enterprise storage. When paired with enterprise-class storage systems it provides a completely redundant, high-availability, high-performance storage solution for workstation and server applications.

HBAs
Fibre Channel

RAID
Adapters

NICs/CNAs

ATTO
Solutions

Desklink
Devices

Storage
Controllers

Switches

Software

Cables

"ATTO is an industry leader and long standing technology partner of Infortrend. Their innovative 16Gb Fibre Channel connectivity products offer seamless compatibility and maximum performance with our EonStor DS 3000 and DS 4000 Storage Systems and prove to be essential for data-intensive, low-latency applications covering enterprise to data center environments."

-Thomas Kao, Senior Director of Product Planning, Infortrend

12Gb & 6Gb SAS/SATA HBAs

ExpressSAS™ Host Bus Adapters

ExpressSAS Host Bus Adapters 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. The newest additions to the ExpressSAS family are the 12Gb SAS/SATA HBAs, available in various configurations. ExpressSAS HBAs feature PCI Express 3.0 bus technology in a low profile form factor and offer the latest miniSAS HD connectors for improved cable management and monitoring.

- 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
- Uses 40% less power than competitive HBAs, reducing overall electric and cooling costs
- Low power consumption expands system performance resources to extend processing capabilities

Supports:

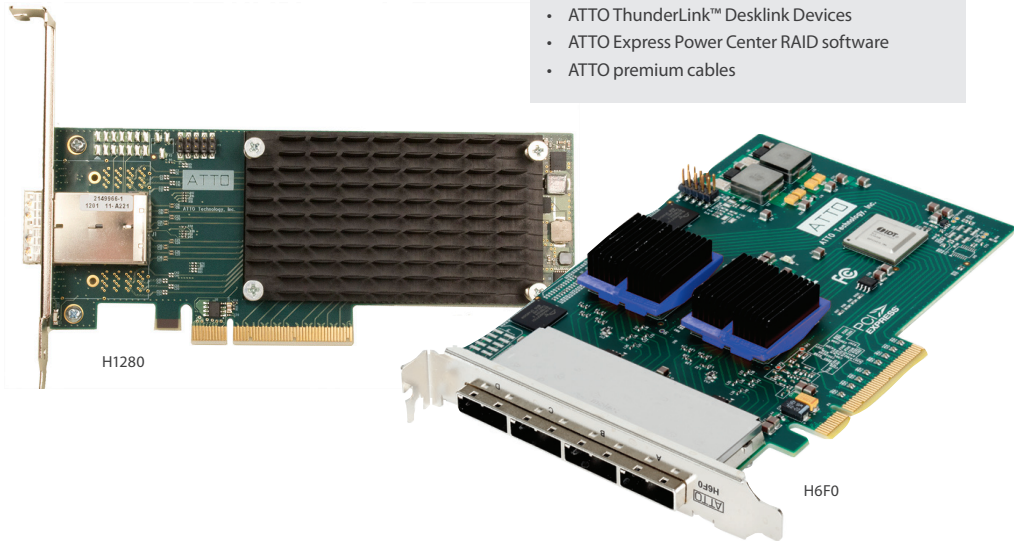
- Mac®, Windows®, Linux® and VMware®
- RAID 0, 1, 10, 1E (*12Gb Only)
- Up to 2048 end point devices
- Certified with industry leading platforms and applications

Includes:

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

Complementary Products:

- ATTO ThunderLink™ Desklink Devices
- ATTO Express Power Center RAID software
- ATTO premium cables



"Working together, ATTO and HGST have completed compatibility testing on the latest 12Gb/s SAS HBAs and SSDs to ensure that enterprise customers are able to take advantage of the performance in this latest leap forward in storage connectivity."

-Chet Mercado, Technical Marketing Engineer, Hitachi Global Storage Technologies

ATTO ExpressSAS Host Bus Adapters

Product Features	H12F0	H120F	H1280	H1208
Part Number	ESAH-12F0-000	ESAH-120F-000	ESAH-1280-000	ESAH-1208-000
SAS/SATA Ports	16	16	8	8
Port Config. (Ext/Int)	16/0	0/16	8/0	0/8
Max. Data Rate	12Gb/s	12Gb/s	12Gb/s	12Gb/s
Bus Type	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
Max. Cable Length (SAS/SATA) ¹	10m/1m	10m/1m	10m/1m	10m/1m
Low-Profile Form Factor	Yes	Yes	Yes	Yes
Developer's Kit ² (Target Mode)	Yes	Yes	Yes	Yes
End Devices Supported	2048	2048	1024	1024
Warranty	3 year	3 year	3 year	3 year

Product Features	H1244	H1248	H12888
Part Number	ESAH-1244-000	ESAH-1248-000	ESAH-1288-000
SAS/SATA Ports	8	12	16
Port Config. (Ext/Int)	4/4	4/8	8/8
Max. Data Rate	12Gb/s	12Gb/s	12Gb/s
Bus Type	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Connector Type	(1) 12Gb miniSAS HD (x4) SFF 8644 External (1) 12Gb miniSAS HD (x4) SFF 8643 Internal	(1) 12Gb miniSAS HD (x4) SFF 8644 External (2) 12Gb miniSAS HD (x4) SFF 8643 Internal	(2) 12Gb miniSAS HD (x4) SFF 8644 External (2) 12Gb miniSAS HD (x4) SFF 8643 Internal
Max. Cable Length (SAS/SATA) ¹	10m/1m	10m/1m	10m/1m
Low-Profile Form Factor	Yes	Yes	Yes
Developer's Kit ² (Target Mode)	Yes	Yes	Yes
End Devices Supported	1024	2048	1024
Warranty	3 year	3 year	3 year

Product Features	H6F0	H60F	H680	H608	H644
Part Number	ESAS-H6F0-000	ESAS-H60F-000	ESAS-H680-000	ESAS-H608-000	ESAS-H644-000
SAS/SATA Ports	16	16	8	8	8
Port Config. (Ext/Int)	16/0	0/16	8/0	0/8	4/4
Max. Data Rate	6Gb/s	6Gb/s	6Gb/s	6Gb/s	6Gb/s
Bus Type	PCIe 2.0 ³ x8	PCIe 2.0 ³ x8	PCIe 2.0 ³ x8	PCIe 2.0 ³ x8	PCIe 2.0 ³ x8
Connector Type	(4) 6Gb mini SAS (x4) SFF 8088 External	(4) 6Gb mini SAS (x4) SFF 8087 Internal	(2) 6Gb mini SAS (x4) SFF 8088 External	(2) 6Gb mini SAS (x4) SFF 8087 Internal	(1) 6Gb mini SAS (x4) SFF 8088 External (1) 6Gb mini SAS (x4) SFF 8087 Internal
Max. Cable Length (SAS/SATA) ¹	10m/1m	10m/1m	10m/1m	10m/1m	10m/1m
Low-Profile Form Factor	—	Yes	Yes	Yes	Yes
Developer's Kit ² (Target Mode)	Yes	Yes	Yes	Yes	Yes
End Devices Supported	1024	1024	1024	1024	1024
Warranty	3 year	3 year	3 year	3 year	3 year

¹ 10m maximum for 12Gb passive copper cables; ATTO supports up to 100m max for active optical cables

² Available for qualified OEM sales only. Please contact your ATTO representative.

³ Cross-compatible with PCIe 3.0

Compatible software available - see page 24.

Compatible cables available - see page 26.

12Gb & 6Gb SAS/SATA RAID Adapters

ExpressSAS™ RAID Adapters

ExpressSAS 12 & 6Gb/s SAS/SATA RAID Adapters provide high performance data protection to direct attached SAS and SATA JBOD storage. With a wide variety of port configurations and RAID levels, these cards offer flexibility for the most diverse range of applications. For over 20 years, ATTO's time-tested RAID technology has provided "no compromise" solutions with the highest performance and data integrity.

ATTO's latest addition to the RAID product line supports full 12Gb data transfers, providing over 1 million 4k IOPS and 7,500 MB/s throughput. With double the performance of standard 6Gb/s technology, ExpressSAS 12 Gb RAID Adapters accelerate enterprise applications such as cloud computing, data center virtualization, business analytics and high-quality video broadcast.

- Optimized for extremely low latency and high-bandwidth transfers for both data-intensive and high-transaction rate applications.
- 100% performance, even during rebuilds
- Rebuilds RAID groups up to 50% faster than competitive solutions
- Uses up to 70% less power than competitive adapters, reducing overall electric and cooling costs
- DriveAssure™ improves system "uptime" because drivers run longer, smoother and faster; drives are groomed to effectively extend their useful life, reducing maintenance costs
- CacheAssure™ securely protects data in non-volatile memory during a power interruption and ensures that storage is online and stable before restoring and synchronizing data.

Supports:

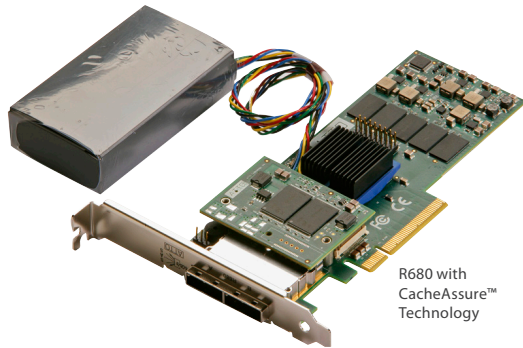
- Mac®, Windows® and Linux®
- RAID levels 0, 1, 4, 5, 6, 10, 40, 50, 60, JBOD and DVRAID™
- Certified with industry leading platforms and applications

Includes:

- Advanced Data Streaming (ADS™) Technology
- DriveAssure™ Technology
- CacheAssure™ Technology (Optional)
- Adaptive Path Optimization
- ATTO Config Tool for customized performance settings

Complementary Products:

- ATTO ThunderLink™ Desklink Devices
- CacheAssure™ Technology
- ATTO Express Power Center RAID software
- ATTO premium cables



R680 with CacheAssure™ Technology

ATTO ExpressSAS RAID Adapters

Product Features	R1208	R1280	R1244
Part Number	ESAR-1208-000	ESAR-1280-000	ESAR-1244-000
Part Number w/ CacheAssure™	ESAR-1208-C00	ESAR-1280-C00	ESAR-1244-C00
SAS/SATA Ports	8	8	8
Port Config. (Ext/Int)	0/8	8/0	4/4
Max. Data Rate	12Gb/s	12Gb/s	12Gb/s
Bus Type	PCIe 3.0	PCIe 3.0	PCIe 3.0
Connector Type	(2) 12Gb miniSAS (x4) SFF 8643 Internal	(2) 12Gb miniSAS (x4) SFF 8644 External	(1) 12Gb miniSAS (x4) SFF 8643 Internal (1) 12Gb miniSAS (x4) SFF 8644 External
Max. Cable Length (SAS/SATA) ²	10m/1m	10m/1m	10m/1m
Low-Profile Form Factor	Yes	Yes	Yes
End Devices Supported	256	256	256
Memory (ECC)	1GB	1GB	1GB
Warranty	3 year	3 year	3 year

Product Features	R60F	R680	R608	R644
Part Number	ESAS-R60F-000	ESAS-R680-000	ESAS-R608-000	ESAS-R644-000
Part Number w/ CacheAssure™	ESAS-R60F-C00	ESAS-R680-C00	ESAS-R608-C00	ESAS-R644-C00
SAS/SATA Ports	16	8	8	8
Port Config. (Ext/Int)	0/16	8/0	0/8	4/4
Max. Data Rate	6Gb/s	6Gb/s	6Gb/s	6Gb/s
Max. Transfer Rate	9600MB/s	4800MB/s	4800MB/s	4800MB/s
Bus Type	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8
Connector Type	(4) 6Gb mini SAS (x4) SFF 8087 Internal	(2) mini SAS (x4) SFF 8088 External	(2) mini SAS (x4) SFF 8087 Internal	(1) mini SAS (x4) SFF 8088 External (1) mini SAS (x4) SFF 8087 Internal
Max. Cable Length (SAS/SATA)	10m/1m	10m/1m	10m/1m	10m/1m
Low-Profile Form Factor	Yes	Yes	Yes	Yes
End Devices Supported	256	256	256	256
Memory (ECC)	1GB	1GB	1GB	1GB
Warranty	3 year	3 year	3 year	3 year

¹ Cross-compatible with PCIe 3.0

² 10m maximum for 12Gb passive copper cables; ATTO supports up to 100m max for active optical cables

Compatible software available - see page 24.

Compatible cables available - see page 26.

Note: CacheAssure™ is available as a field upgradable unit for existing 6Gb RAID users. Contact your ATTO representative.

HBAs

RAID Adapters

NICs/CNAs

ATTO Solutions

Desklink Devices

Storage Controllers

Switches

Software

Cables

"Data storage and management is a huge part of our business ... we choose ATTO products because they have a history of providing the best tools available and give us the confidence that our data is stored both safely and securely."

-Chris Peariso, Chief Technical Officer, LightIron

40Gb & 10Gb Ethernet Optical and 10GBASE-T NICs

FastFrame™ Network and Storage Interface Cards

The ATTO family of 10/40GbE Network and Storage Interface Cards is available in single-, dual- and quad-port (10GbE only) configurations and can be used anywhere in your infrastructure, including workstations, storage, servers and data center racked servers. Mac®, Windows®, VMware®, FreeBSD and Linux® driver support ensure that FastFrame cards are suitable for applications ranging from post-production M&E environments to NAS installations serving medical imaging data, big data analytics environments, high performance computing clusters (HPCs) and more.

As a pioneer in iSCSI, ATTO's FastFrame family has been designed for the rigorous data transfer and reliability standards required for storage interconnect. The flexibility of the FastFrame product line extends from both support for 10- and 40GbE optical options (SFP+ for 10GbE, QSFP+ for 40GbE), to connectivity options including DAC and 10GBASE-T. All optical cards also feature Direct Attach Copper (DAC) support*, while 10GBASE-T cards work with standard low-cost Cat6a cabling. ATTO's 10GbE quad-port NIC also provides more VMs per PCIe bus than dual or single-port competitive products.

- FastFrame leverages ATTO's exclusive Advanced Data Streaming (ADS™) Technology to provide high-bandwidth and managed latency for high-performance, enterprise-level iSCSI storage as well as standard 10GbE network infrastructures
- ATTO's 40GbE NICs provide RDMA/RoCE support with best in class 1us MPI ping latency for HPC and HFT environments
- FastFrame cards support Energy Efficient Ethernet and are up to 30% more efficient in their power consumption, drastically reducing data center operating costs

Supports:

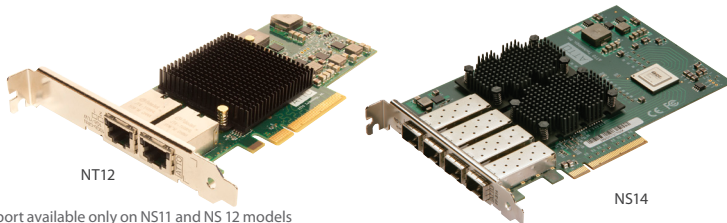
- Mac® (10GbE available now, 40GbE Q3 2015), Windows®, Linux®, FreeBSD and VMware®
- Data Center Bridging Ethernet
- RDMA/RoCE Support (40GbE only)
- iSCSI initiators
- Certified with industry leading platforms and applications

Includes:

- Advanced Data Streaming (ADS™) Technology
- Pluggable optical SFP+/QSFP+ (NS Models Only)

Complementary Products:

- ATTO ThunderLink™ Desklink Devices
- ATTO premium cables



*DAC support available only on NS11 and NS 12 models

"Including ATTO as the storage connectivity and networking interfaces in our solution is an easy choice for us. Combining proven performance and stability of their 10GbE NICs and RAID adapters with our solutions provides our customers with an ideal high-performance and reliable method of digital asset management."

-Tim Jones, President and CTO, TOLIS Group

ATTO FastFrame SFP+ Network Interface Cards

Product Features	NS14	NS12	NS11	NS42	NS41
Part Number	FFRM-NS14-000	FFRM-NS12-000	FFRM-NS11-000	FFRM-NS42-000	FFRM-NS41-000
10GbE Ports	4	2	1	Equivalent of 8	Equivalent of 4
Max. Data Rate	10Gb/s	10Gb/s	10Gb/s	40Gb/s	40Gb/s
Bus Type	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8	PCIe 3.0 x8	PCIe 3.0 x8
Connector Type	Optical SFP+ LC	Optical SFP+ LC	Optical SFP+ LC	Optical QSFP+	Optical QSFP+
Low-Profile Form Factor	—	Yes	Yes	Yes	Yes
Warranty	3 year	3 year	3 year	3 year	3 year

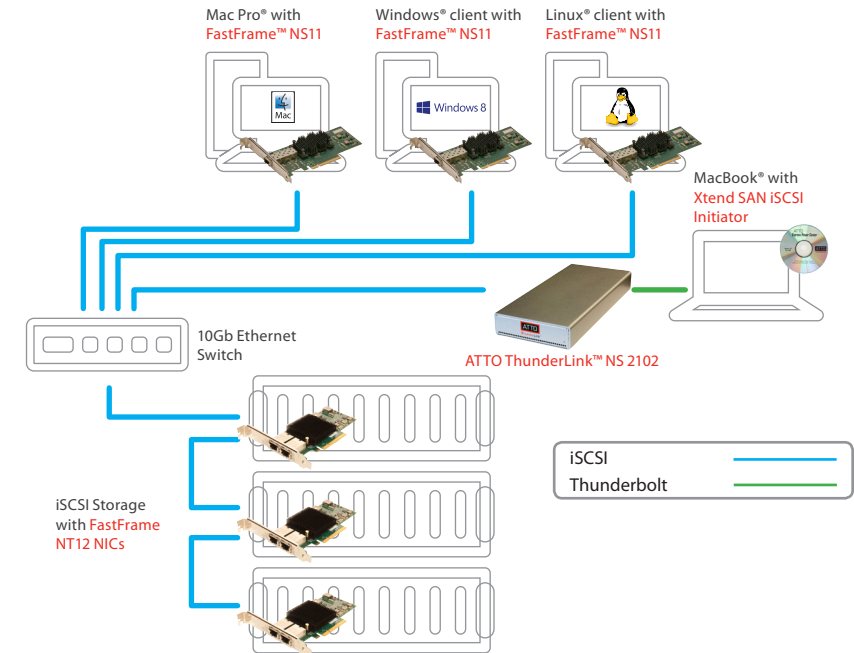
ATTO FastFrame 10GBASE-T Network Interface Cards

Product Features	NT12	NT11
Part Number	FFRM-NT12-000	FFRM-NT11-000
10GbE Ports	2	1
Max. Data Rate	10Gb/s	10Gb/s
Bus Type	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8
Connector Type	RJ45	RJ45
Low-Profile Form Factor	Yes	Yes
Warranty	3 year	3 year
Warranty	3 year	3 year

¹ Cross-compatible with PCIe 3.0
Compatible software available - see page 24.
Compatible cables available - see page 26.

Use Case

iSCSI SAN Configuration



HBAs

RAID Adapters

NICs/CNAs

ATTO Solutions

Desklink Devices

Storage Controllers

Switches

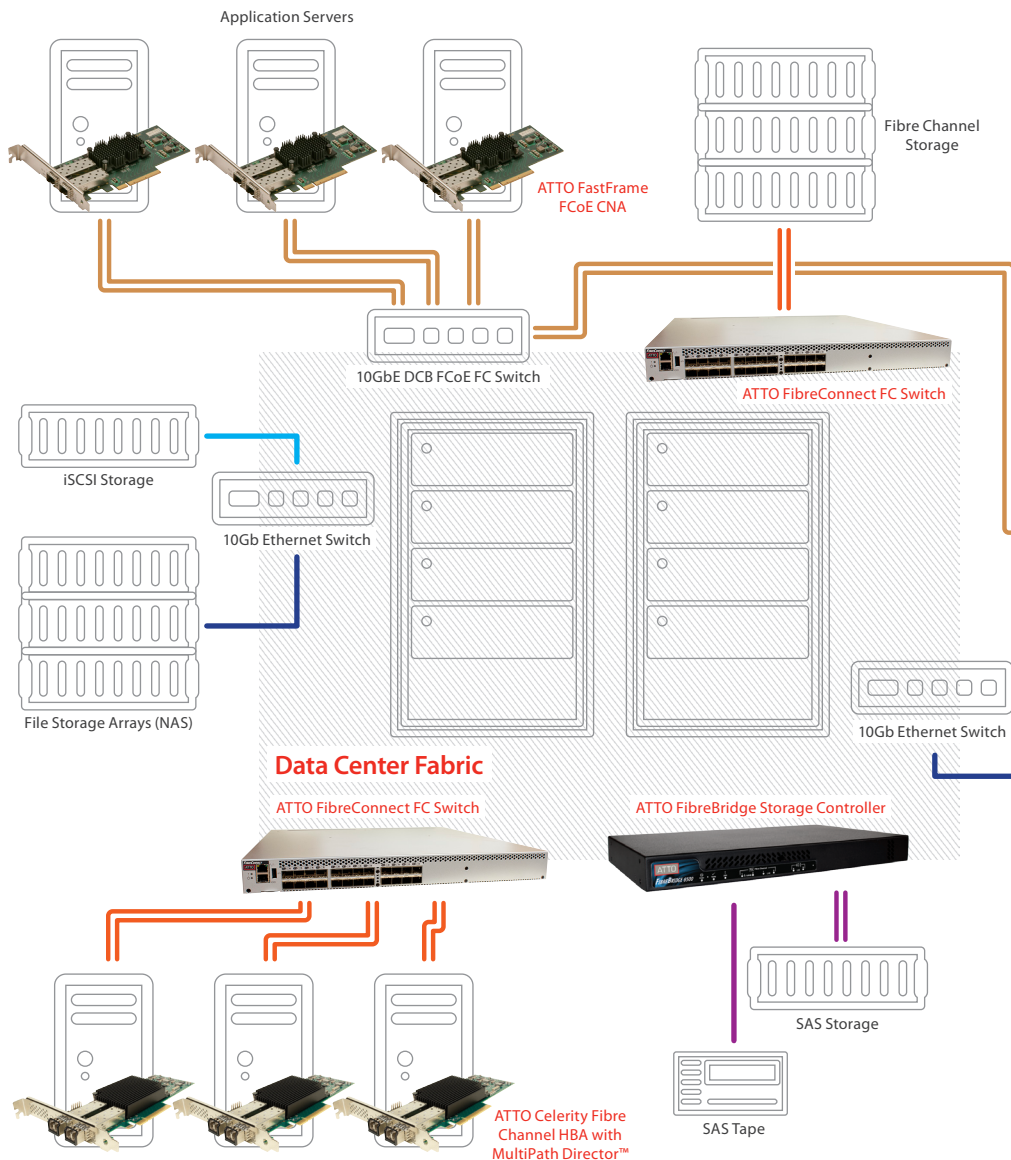
Software

Cables

ATTO develops high-performance products that manage latency in the most demanding, real-time environments resulting in accelerated application performance and enhanced transaction processing, and the ability to handle large workloads and client counts.

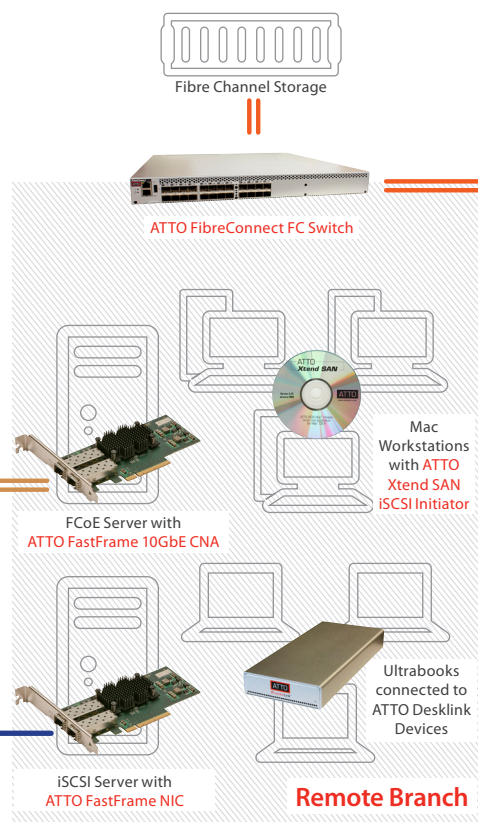
Enterprise - IOPS

Database | ERP | Web Servers | Email Servers | Back-Office Operations



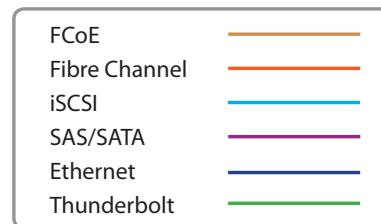
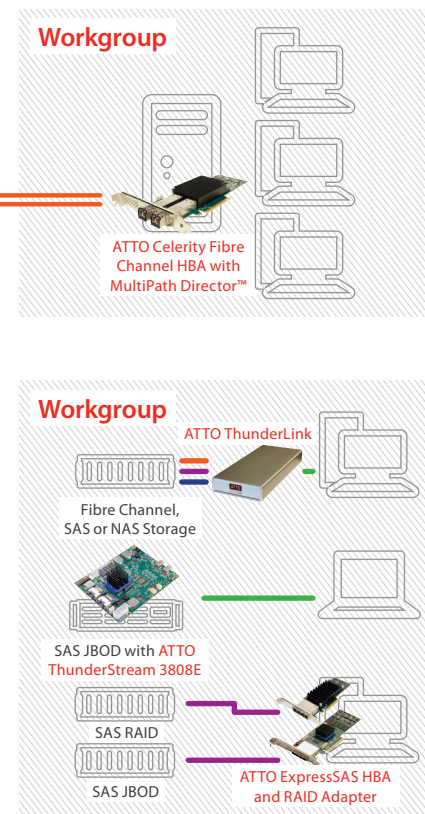
Departmental - Mixed Environment

Business Analytics | Financial/OLTP
Supply Chain | Asset Management | Operations



Workgroup - MB/sec

CAD/CAE | Video Production/Broadcast
Medical Imaging | Seismic/Oil & Gas



ATTO components are designed to work seamlessly together to deliver maximum performance for bandwidth-intensive environments from application specific workgroups to large-scale enterprise infrastructures. ATTO delivers the most extensive portfolio of high-performance storage and network connectivity products that are certified for interoperability with industry leading server, tape and disk storage, workstation, server and application vendors.

10Gb Ethernet CNAs

FastFrame™ Converged Network Adapters

The ATTO family of FastFrame Converged Network Adapters (CNAs) combine the functionality and performance of ATTO's Celerity™ Host Bus Adapters (HBAs) with the data transfer reliability of the FastFrame storage and network controller. FastFrame CNAs are available in dual- and quad-port configurations, while Mac®, Windows® and Linux® driver support ensures that they are suitable for any application. FastFrame CNAs deliver Fibre Channel's performance and reliability over standard, low-cost Ethernet cabling.

ATTO's pioneering of the VN2VN protocol allows FastFrame CNAs to be used in Fibre Channel over Ethernet (FCoE) SANs, reducing capital costs by eliminating the need for a Fibre Channel Forwarding (FCF) switch. Additionally, ATTO's FCoE implementation utilizes ATTO's time-tested and industry-proven Fibre Channel stack, ensuring the best possible FCoE performance and data reliability.

- The first CNAs to support VN2VN, the FastFrame family adds ATTO's Advanced Data Streaming (ADS™) to support 10Gb Ethernet, iSCSI storage and Fibre Channel SANs on a single card
- Data Center Bridging support ensures lossless Ethernet for applications where guaranteed data delivery rates are required
- FastFrame cards are up to 30% more efficient in their power consumption, drastically reducing operating costs in data centers. Low power consumption expands system performance resources to extend processing capabilities

Supports:

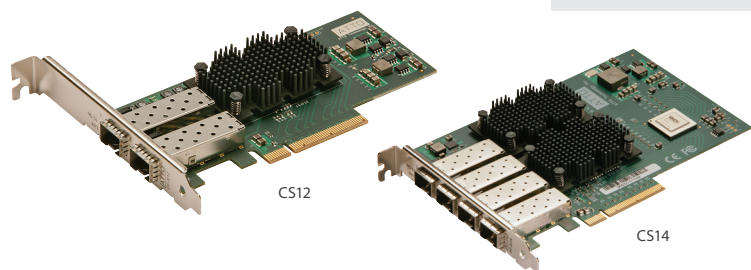
- Mac®, Windows® and Linux®
- Simultaneous 10GbE, FCoE, iSCSI
- VN2VN
- Simultaneous block-level & file-level I/O
- Data Center Bridging & Lossless Ethernet
- iSCSI initiators
- Certified with industry leading platforms & applications

Includes:

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

Complementary Products:

- ATTO ThunderLink™ Desklink Devices
- ATTO premium cables



"ATTO's cross-platform support is why we incorporate their solutions in our labs. We have both Windows and Mac products and ATTO provides the driver support we need on both platforms as well as their extensive OS support for all the variations of those platforms."

-Robb Cadzow, Application Engineer, Telstream

ATTO FastFrame Converged Network Adapters

Product Features	CS14	CS12
Part Number	FFRM-CS14-000	FFRM-CS12-000
10GbE Ports	4	2
Max. Data Rate	10Gb/s	10Gb/s
FCoE Support	Yes	Yes
Bus Type	PCIe 2.0 ¹ x8	PCIe 2.0 ¹ x8
Connector Type	Optical SFP+ LC	Optical SFP+ LC
Low-Profile Form Factor	—	Yes
Warranty	3 year	3 year
Warranty	3 year	3 year

¹ Cross-compatible with PCIe 3.0

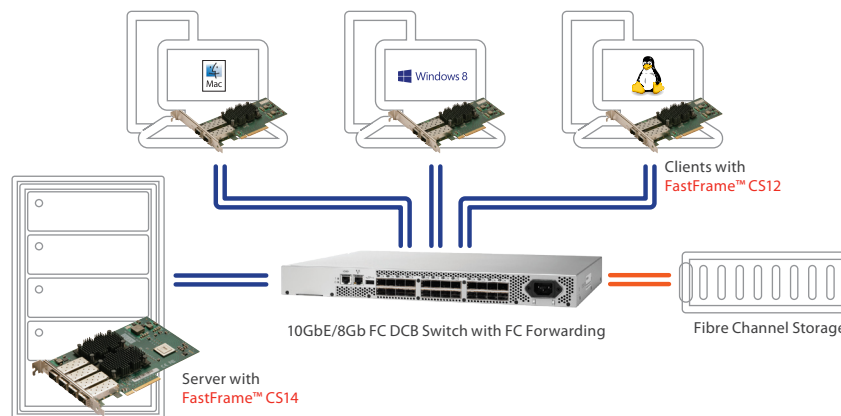
Compatible software available - see page 24.

Compatible cables available - see page 26.

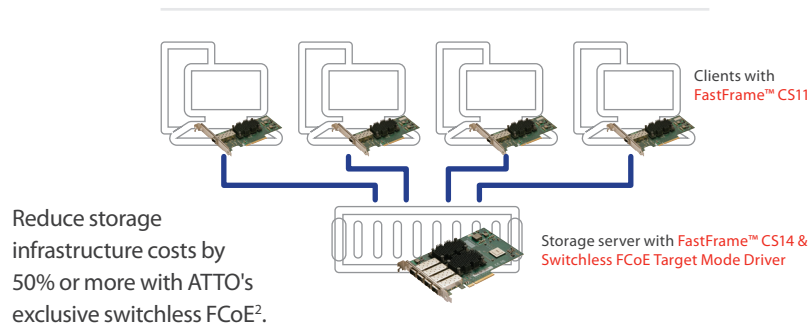
Use Case

FastFrame CNA supports a range of solutions: 10Gb NAS, iSCSI, FCoE

Standard FCoE SAN Configuration



ATTO VN2VN Target Mode Configuration



Reduce storage infrastructure costs by 50% or more with ATTO's exclusive switchless FCoE².

Available for qualified OEMs. Please contact your ATTO representative.

Fibre Channel
Ethernet

HBAs

RAID
Adapters

NICs/CNAs

ATTO
Solutions

Desklink
Devices

Storage
Controllers

Switches

Software

Cables

Thunderbolt™ Desklink Devices

ATTO ThunderLink™ & ThunderStream™

ATTO ThunderLink and ThunderStream Desklink Devices enable today's small form factor platforms to connect into high performance storage and networks, including SAS, SATA, Fibre Channel and Ethernet infrastructures. ATTO ThunderLink and ThunderStream products are focused on applications where performance and latency management are essential. With Thunderbolt connectivity, creative, engineering and scientific professionals now have access to storage and networks at speeds not previously available. ATTO's exclusive Advanced Data Streaming (ADS™) technology provides the fastest, most consistent time-to-data, delivering best-in-industry aggregate bandwidth and predictable data transfers for high performance applications or mobile platform users.

- Only way to connect all-in-one systems, laptops and integrated computers into high performance storage and networks
- Makes the ATTO portfolio of solutions, with full features and functionality, available to Thunderbolt technology-enabled platforms
- Daisy-chaining, combined with hot-plug capability, allows addition of devices or reconfiguration of the entire system on-the-fly



ThunderLink

ThunderLink Supports:

- Mac® and Windows®
- Certified with industry leading platforms and applications
- DisplayPort (including 4k), Hot Plug, Daisy Chain

Includes:

- Advanced Data Streaming (ADS™) Technology
- ATTO Config Tool™ for customized performance settings

Complementary Products:

- ATTO Celerity™ Fibre Channel HBAs
- ATTO ExpressSAS™ HBAs and RAID Adapters
- ATTO FastFrame™ CNAs & NICs
- ATTO FibreBridge™ Fibre Channel Storage Controllers
- ATTO FibreConnect™ Fibre Channel Switches
- ATTO premium cables

ThunderStream Supports:

- Mac® and Windows®
- RAID Levels 0, 1, 5, 6, 10
- DisplayPort (including 4k), Hot Plug, Daisy Chain, Autonomous Operation

Includes:

- Advanced Data Streaming (ADS™) Technology
- Adaptive Path Optimization Technology
- DriveAssure™ Technology
- ATTO Config Tool™, an easy to use management and monitoring interface
- Automatic drive initialization and verification to identify drives with soft errors or performance issues

Complementary Products:

- ATTO ExpressSAS™ RAID Adapters
- ATTO premium cables

"The ATTO Technology 8Gb ThunderLink allows Mac Pro workstations and other Thunderbolt enabled devices to connect directly to our storage. It has opened a door for our end-users to connect to Wicked Fast Dot Hill storage"

-Jim Jonez, Vice President of Marketing, Dot Hill

ATTO ThunderLink™ Desklink Devices

Product Features	Fibre Channel	SAS/SATA HBA	10GBASE-T NIC	10GbE NIC			
Part Number	TLFC-2162-D00/DE0 ¹	TLFC-2082-D00/DE0 ¹	TLSH-2068-D00/DE0 ¹	TLNT-2102-D00/DE0 ¹	TLNS-2102-D00/DE0 ¹	TLNS-2101-D00/DE0 ¹	TLNS-1101-D00/DE0 ¹
Input Connectors	(2) 20Gb/s Thunderbolt™	(2) 20Gb/s Thunderbolt™	(2) 20Gb/s Thunderbolt™	(2) 20Gb/s Thunderbolt™	(2) 20Gb/s Thunderbolt™	(2) 20Gb/s Thunderbolt™	(2) 10Gb/s Thunderbolt™
Output Connectors	(2) 16Gb/s Fibre Channel	(2) 8Gb/s Fibre Channel	(2) x4 6Gb/s SAS/SATA	(2) 10GbE	(2) 10GbE	(1) 10GbE	(1) 10GbE
Connector Type	(2) Optical SFP+ LC	(2) Optical SFP+ LC	(2) mini SAS (x4) SFF 8088 External	(2) RJ45	(2) Optical SFP+ LC	(1) Optical SFP+ LC	(1) Optical SFP+ LC
Form Factor	Desktop	Desktop	Desktop	Desktop	Desktop	Desktop	Desktop
Warranty	3 year	3 year	3 year	3 year	3 year	3 year	3 year

ATTO ThunderStream™ Desklink Devices - RAID

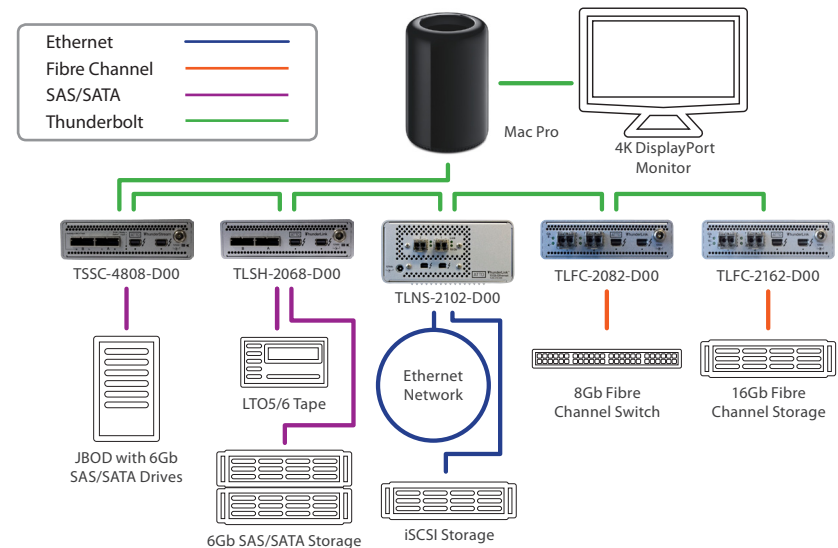
Product Features	4808D
Part Number	TSSC-4808-D00/DE0 ¹
Input Connectors	(2) 20Gb Thunderbolt™
Output Connectors	(2) x4 6Gb SAS/SATA RAID
Connector Type	(2) mini SAS (x4) SFF 8088 External
Devices supported	128
Expander/Port Multiplier support	Yes
10-Bit HD streams supported	Up to 7
Form Factor	Desktop
Warranty	3 year

^[1] Includes UK/EMEA power components, accessories

^[2] Cross compatible with Thunderbolt 2

Compatible cables & accessories available - see page 26.

Use Case



Storage Controllers

FibreBridge™ Fibre Channel to SAS Storage Controllers

The ATTO FibreBridge offers versatility, connectivity and enhanced device management capabilities by virtualizing SAS storage devices for incorporation into Fibre Channel SAN infrastructures. Scaling from workgroup to enterprise implementations, it provides enterprise-class management and monitoring, coupled with faster time-to-data and improved overall data throughput.

FibreBridge allows users to build their own storage with lower cost SAS JBOD enclosures and SSD/HDD devices for a lower capital investment compared to Flash or Hybrid storage arrays. Both the 6500 and 7500 leverage Fibre Channel's ability to transfer data between remote sites with minimal latency for stretch cluster installations that enable disaster recovery and downtime avoidance. Additionally, the 6500 enables tape libraries to be added to a Fibre Channel SAN.

- Compatible with all JBODs, hard disk drives, solid state drives, tape libraries, RAID Arrays and RAID controllers
- Patented Drive Map Director™ reduces operating expenses by eliminating manual mapping of LUNs and the need to remap LUNs if a drive shelf is removed for maintenance or failure
- Advanced Data Streaming (ADS™) improves backup time to tape or disks, reducing backup windows and enabling more concurrent streams of data
- Virtual Device Response (VDR) Technology enables devices to queue and execute commands on behalf of busy or unresponsive tape storage, reducing the number of failed or incomplete backups

Supports:

- Full-duplex Fibre Channel data transfers
- Error recovery
- Certified with industry leading platforms and applications
- Single or dual power supplies

Includes:

- Advanced Data Streaming (ADS™) Technology
- ExpressNAV™ web-based GUI simplifies management, monitoring and diagnostics
- intelligent Controller Architecture™
- Virtual Device Manager
- Virtual Drive Response (VDR)
- Drive Map Director™
- SpeedWrite™
- Pluggable optical SFP+

Complementary Products:

- ATTO Celerity™ Fibre Channel HBAs
- ATTO premium cables



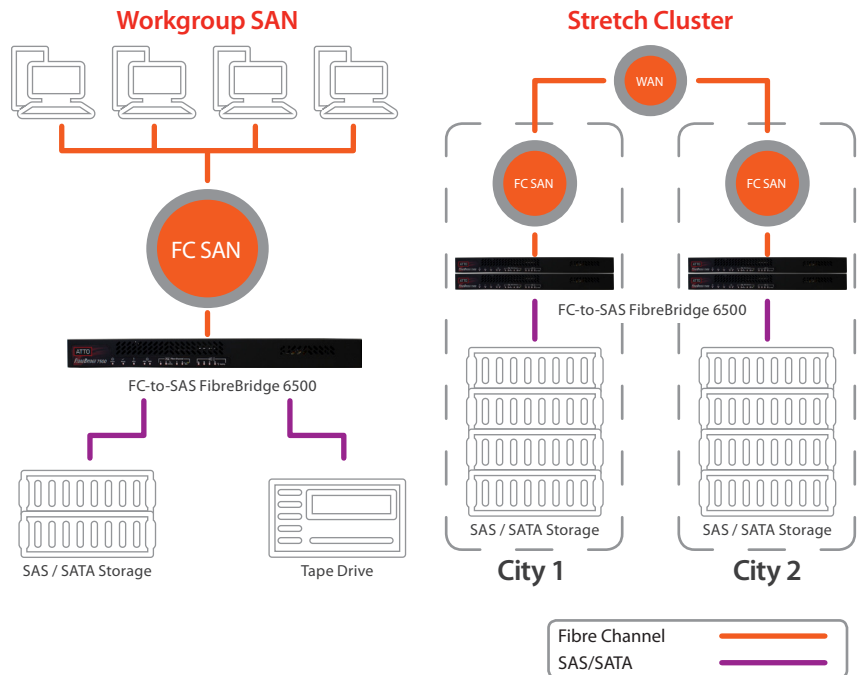
"ATTO storage controllers give us more than just basic connectivity... advanced troubleshooting and tuning features are invaluable in the field."

-Dave Griffith, Vice President, Operations & Business Development, Qualstar

ATTO FibreBridge™ Fibre Channel Storage Controllers

Product Features	7500	6500	6500E ¹
Part Number	FCBR-7500-DPS(Dual Power Supply)	FCBR-6500-D00 (Single Power Supply) FCBR-6500-DPS (Dual Power Supply)	FCBR-6500-E00
Max Sustained Transfer Rate	3200 MB/s	1200 MB/s	1200 MB/s
IOPS	1,000,000	100,000	100,000
Input Connectors	(2) 16Gb Fibre Channel SFP+	(2) 8Gb Fibre Channel SFP+	(2) 8Gb Fibre Channel SFP+
Output Connectors	(4) 12Gb HD Mini SAS (x4) SFF 8644	(2) 6Gb Mini SAS (x4) SFF 8436	(2) 6Gb Mini SAS (x4) SFF 8436
Management Ports	RS-232/RJ45	RS-232/RJ45	RS-232/RJ45
Ethernet Protocols	IPv4, IPv6	IPv4	IPv4
Secure Protocols (SSL)	Future	No	No
Built-In PCIe Analyzer	Yes	No	No
Acceleration Hardware	Yes	No	No
Devices supported	240	240	240
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	Embedded - MicroATX
Power Supplies	2 Hot Swap	1 or 2 Fixed	—
Disk Support	Yes	Yes	Yes
Tape Support	Future	Yes	Yes
Warranty	2 year	2 year	1 year

¹ Embedded models available to OEMs only
Compatible cables & accessories available - see page 26.



FibreBridge is deployed in thousands of data centers worldwide

16Gb & 8Gb Fibre Channel Switches

FibreConnect™ Switches

ATTO FibreConnect Fibre Channel Switches combine high performance with exclusive latency management features for a completely scalable end-to-end SAN connectivity solution. This combination ensures smooth and reliable data transfers on a SAN to keep pace with growing business demands. Fibre Connect switches streamline workflow processes and are ideal for streaming media, virtualized and backup/recovery applications.

- Designed, built and tested for low latency to ensure smooth and reliable transfers
- Guaranteed uninterrupted bandwidth for time-sensitive applications
- Facilitates collaborative workflows allowing multiple users to share resources, increasing productivity
- Pay-as-you-grow options enable organizations to grow at their own pace in an affordable, flexible and non-disruptive manner
- Simplifies administration with easy implementation and comprehensive management tools
- Maximizes infrastructure uptime with advanced monitoring, management and diagnostic tools
- Fully tested and interoperable SAN solution

Supports:

- 2*, 4, 8 and 16Gb/s devices
- Ports-On-Demand scalability (increments of 8 or 12)
- Certified with industry leading platforms and applications

Includes:

- Pluggable optical LC SFP+
- Web Tools interface simplifies configuration and management
- Mounting hardware

Complementary Products:

- ATTO Celerity™ Fibre Channel HBAs
- ATTO FibreBridge™ Fibre Channel Storage Controllers
- ATTO ThunderLink™ Desklink Devices
- ATTO premium cables

*Included SFPs support 4, 8 and 16Gb/s devices



FibreConnect™ 1612

"Our high-performance audio and video systems are designed for very diverse and demanding groups of people. ATTO products are an integral part in many of the media solutions we offer our customers."

-Peyman Dadpanah, Business Director, MediaCast

ATTO FibreConnect™ Switches

Product Features	1612	8324	8316	8308
Part Number	FCSW-1612-D00 (Single Power) FCSW-1612-D02 (Dual Power)	FCSW-8324-D00	FCSW-8316-D00	FCSW-8308-D00
Fibre Channel Ports	12 ¹	24	16	8
Max. Data Rate	16Gb/s	8Gb/s	8Gb/s	8Gb/s
Aggregate Bandwidth	192Gb/s ²	192Gb/s	128Gb/s	64Gb/s
Auto-Sensing	2, 4, 8, 16Gb/s	2, 4, 8Gb/s	2, 4, 8Gb/s	2, 4, 8Gb/s
Form Factor	1U Desktop/ Rackmount	1U Desktop/ Rackmount	1U Desktop/ Rackmount	1U Desktop/ Rackmount
Low Power <2.5W/Port	Yes	Yes	Yes	Yes
Web Tools	Yes	Yes	Yes	Yes
Warranty	1 Year ³	1 Year ³	1 Year ³	1 Year ³

¹ 12 port expansion available for a total of 24 ports

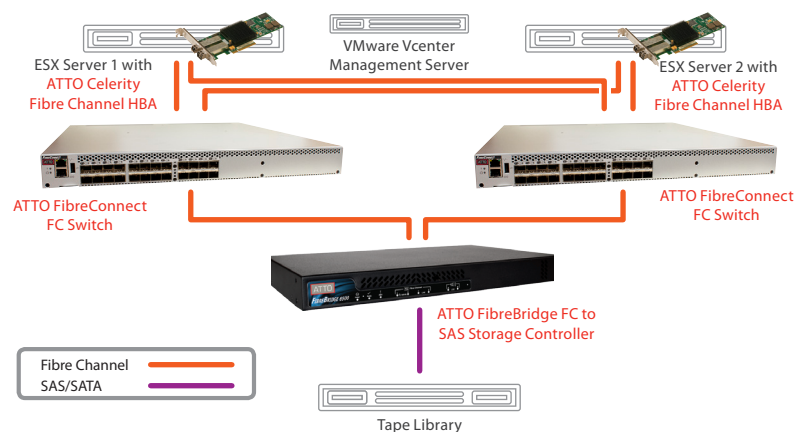
² 384Gb/s with 24 active ports

³ Extended warranty available

Compatible cables & accessories available - see page 26.

Use Case

Improving performance while utilizing existing storage



ATTO FibreConnect 16Gb Gen 5 powered switches provide a critical building block for today's highly virtualized data center environments and offers low-cost access to industry-leading Storage Area Network (SAN) technology. FibreConnect is designed to maximize application uptime with "five nines" availability and delivers consistent optimum performance while reducing overall operational expenses. Celerity HBAs and FibreBridge Fibre Channel Storage Controllers provide a completely flexible, high-performance and scalable end-to-end virtualized SAN connectivity solution.

Software

XtendSAN and Disk Benchmark

XtendSAN

Xtend SAN iSCSI Initiator for Mac® software connects workstations with built-in Ethernet to multiple Direct Attached Storage servers across long distances. It provides users with 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, but on a manageable budget.

- Easy setup and management features make implementing an iSCSI SAN simple
- High performance for demanding applications
- EMC® E-Lab Certified
- Compatible with 32/64 bit Mac OS® X
- Volume and Enterprise Licensing available

ATTO Disk Benchmark

The 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: 1, 5, 10, 25, and 100

Complementary Products:

- ATTO FastFrame™ NICs and CNAs
- ATTO ThunderLink™ and ThunderStream™ Desklink Devices

Part Number:

- INIT-MAC0-001

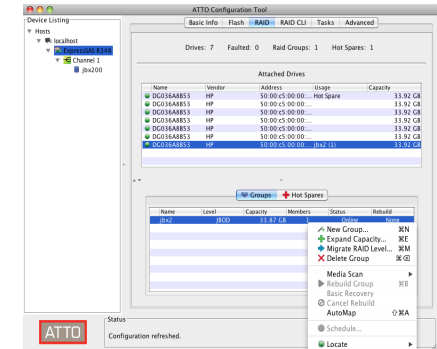
Management Tools

Config Tool™ and ExpressNAV™

Config Tool™

ATTO Config Tool helps customize the settings of your ATTO host bus adapter (HBA) to maximize the performance of your storage connection. Standard on all ATTO HBAs and Desklink Devices, ATTO Configuration Tool is available for Mac®, Windows® and Linux® operating systems. While the factory settings on your host adapter provide excellent performance for a wide range of applications, some specialized applications may benefit from adjustment of the adapter settings to tune the adapter for a specific performance range.

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

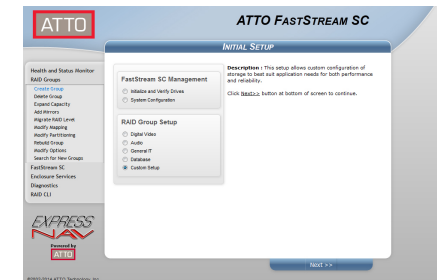


ExpressNAV™

The ExpressNAV remote management interface helps get ATTO appliances up and running in as little as five minutes without specialized IT personnel.

ExpressNAV helps users spend less time managing storage and more time accessing data. Storage environments can haphazardly build up with disparate storage groups, making it necessary to tend to several management interfaces. FibreBridge Fibre Channel Storage Controllers equipped with ExpressNAV help manage complete storage infrastructures via a single user interface.

- Advanced performance tuning
- Email notification for monitoring
- Event logging



HBAs

RAID Adapters

NICs/CNAs

ATTO Solutions

Desklink Devices

Storage Controllers

Switches

Software

Cables

"We found that Xtend SAN was a hassle-free initiator that just worked and was easy to implement and integrate."

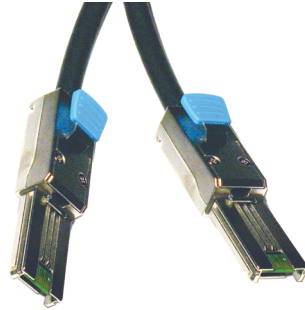
-Ed Casaccia, Senior Director of Product Marketing for Servers and Storage, Grass Valley

ATTO Cables and Accessories

Premium Connectivity Components

For over 25 years, ATTO has conducted in-depth testing on the effects of noise, interference and cable lengths on connectivity solutions. ATTO premium cables are specifically designed to optimize connections between high-performance storage, servers and workstations and are recommended for use with all ATTO products to ensure the highest levels of performance and data reliability.

Utilizing high-quality shielding, equipment-specific cable lengths and extensive pull testing to verify connection integrity, these premium cables ensure the best performance and data integrity from your ATTO-enabled infrastructure.

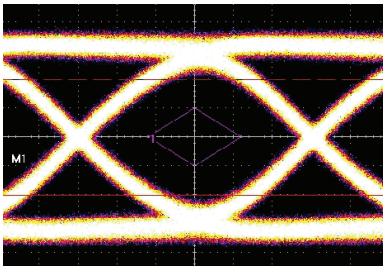


SAS Cable, External SFF-8088 to SFF-8088

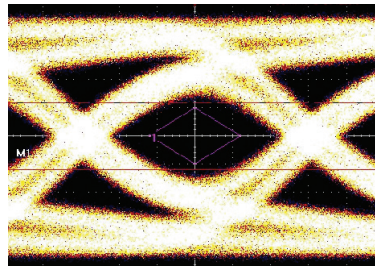
Pure Signal Integrity

ATTO Technology has been manufacturing storage connectivity products for over 25 years, becoming experts in the art of developing clean board design for smooth data streaming. ATTO engineers focus on signal integrity, designing to minimize jitter, crosstalk, reflections, and power supply noise, resulting in the cleanest signals in the industry.

This is one of the reasons why ATTO is the most trusted storage connectivity solution provider for high speed streaming applications. Signal quality is the best indicator of performance and could be the difference between completing projects on time, missing deadlines, or losing critical data. ATTO products can be relied upon for uninterrupted, reliable, and high-performance data transfers.



ATTO Cable Signal:
Clean eye pattern = tighter signal strength
Smooth and reliable data transfers



Substandard Cable Signal:
Distorted eye pattern = weaker signal integrity
Possible data loss, errors

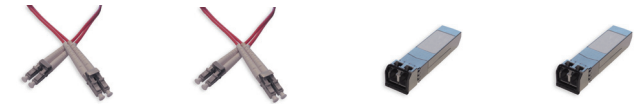


SAS/ SATA	External SFF-8088 to SFF-8088	External SFF-8088 to SFF-8470	External SFF-8644 to SFF-8088	External SFF-8436 to SFF-8088	Internal SFF-8087 to (x)1 SATA	Internal SFF-8087 to SFF-8087	Internal I2C 3-Pos to 3-Pos	External SFF-8644 to SFF-8644
Length	1 & 3 meters ¹	1 & 3 meters ¹	1 meter	1 & 3 meters ¹	.5 meters	.5 meters	.5 meters	3 meters
For use with	ESAS-H6F0 ESAS-R680 ESAS-H680 ESAS-R644 ESAS-H644 TLSH-2068 TSSC-4808	ESAS-H6F0 ² ESAS-R680 ² ESAS-H680 ² ESAS-R644 ² ESAS-H644 ² TLSH-2068 ² TSSC-4808 ²	ESAH-1244 ESAH-1248 ESAH-1288 ESAH-12F0 ESAH-1280 ESAR-1280 ESAR-1244	ESAS-H6F0 ESAS-H680 ESAS-H644 ESAS-R644 FCBR-6500/7500	ESAS-H60F ESAS-H608 ESAS-H644 ESAS-R60F ESAS-R608 ESAS-R644 TSSC-4808 ³	ESAS-H60F ESAS-H608 ESAS-H644 ESAS-R60F ESAS-R608 ESAS-R644 TSSC-4808 ³	ESAS-H6F0 ESAS-H608 ESAS-R60F ESAS-R608	ESAH-1244 ESAH-1248 ESAH-1288 ESAH-12F0 ESAH-1280 ESAR-1280 ESAR-1244
Part #	CBL-8088-EX1 CBL-8088-EX3	CBL-8470-EX1 CBL-8470-EX3	CBL-4488-E1X	CBL-QSFP-EP1 CBL-QSFP-EP3	CBL-SATA-INT	CBL-8087-INT	CBL-SI2C-K12	CBL-8644-EX3

¹ SATA limited to 1 meter, use with SAS targets only

² Also supported by External SFF-8644 to SFF-8088

³ Embedded models only



Fibre Channel	LC to LC 50 µm OM 2	LC to LC 50 µm OM 2	8Gb/s SFP+ LC SW Optical	16Gb/s SFP+ LC SW Optical
Length	3 meters	10 meters	Standard	Standard
For use with	CTFC-164E/162E/161E CTFC-84EN/82EN/81EN TLFC-2082/2162 TLNS-1101 FF-CS14/CS12/CS11 FF-NS14/NS12/NS11 FCBR-6500/7500 FC 8308/8316/8324/1612	CTFC-164E/162E/161E CTFC-84EN/82EN/81EN TLFC-2082/2162 TLNS-1101 FF-CS14/CS12/CS11 FF-NS14/NS12/NS11 FCBR-6500/7500 FC 8308/8316/8324/1612	CTFC-84EN/82EN/81EN FCBR-6500 TLFC-2082	CTFC-164E/162E/161E TLFC-2162 FCBR-7500
Part Number	CBL-LCLC-R03	CBL-LCLC-R10	SFP8-0000-R00	SFPX-0016-R00

ATTO Cable Finder

Please visit the ATTO website to best determine the cable for your configuration.

Cable Finder

Celerity FC-164E

Select your ATTO HBA connection:

Select your target device connection:

LC SW Optical

LC SW Optical

Your recommended cable options:

Fibre Channel Cable, LC to LC

HBAs

RAID
Adapters

NICs/CNAs

ATTO
Solutions

Desklink
Devices

Storage
Controllers

Switches

Software

Cables

"When anyone has connectivity issues we just tell them to put in an ATTO card to solve their challenge."

-David Fontaine, General Manager, Cap Ciné

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International Sales: Extension 239

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"The real joy of working with ATTO is the solid support that they offer while continuing to drive the industry standard for IT professionals in audio, video post-production, and other creative environments."

-Frank Altschuler, Product Marketing Manager, Other World Computing

Industry Partners





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