

ATTO

ATTO Technology, Inc.



Product Catalog

Volume One, 2010

Host Adapters • RAID Adapters • Bridges • RAID Storage Controllers • Switches • Management Software • Fibre Channel • SAS • SATA • SCSI • iSCSI • FCoE

ATTO - The Power Behind the Storage

High-Performance Storage Connectivity and Infrastructure Solutions

For over 20 years, ATTO Technology has embraced a simple product mission: consistently meet the industry demands for better storage connectivity and infrastructure solutions through leading-edge technology. Our products are based on centralized core architectures of hardware and software, ensuring that technology and features fit seamlessly throughout our product lines.



ATTO is internationally recognized as an innovator in the ever-changing computer world, and we continue to be on the forefront of technologies that retain the qualities of the ATTO brand: user friendly, high performance and customer focused.

Storage connectivity's ongoing advancements require increasing performance levels and solution options. ATTO products are engineered to optimally perform in the most demanding computer environments. Whether you're an OEM or system integrator looking for a tailored product, a large organization or single-user with high-capacity or specific storage connectivity needs, ATTO has a solution that will work seamlessly to store, manage and deliver your data.




Where there's a need, there's a solution.

Where there's ATTO, there's Power Behind the Storage.



ATTO Headquarters - Amherst, NY

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ATTO Host and RAID Adapters

Fibre Channel, SAS/SATA, and SCSI Products

ATTO Host and RAID adapters are engineered for industry-leading performance, providing the fastest data throughput available for today's demanding computing environments. Whether you need connectivity for direct-attached or networked storage, ATTO host and RAID adapters are based on the same core building blocks that include:

- **Advanced Data Streaming (ADS™) Technology** – ADS is a combination of features in ATTO's microcode that control the acceleration of data, providing faster and more efficient transfers. This exclusive technology enables users to achieve the ultimate in I/O performance for real-time and transactional applications, including digital content creation, rich media, prepress, database and general server environments.

(See page 11)



H308 & H644

- **Proven Interoperability** – ATTO performs rigorous and comprehensive testing that analyzes product performance under a wide array of conditions including design validation, application testing, systems testing and ongoing reliability testing. ATTO, well-established in the storage community, has fostered long-term partnerships with key technology companies and boasts an extensive list of product certifications with respected industry partners.



FC-82EN

- **Easy to Use & Customizable** – Configuration utilities make ATTO host adapters easy to use. The ATTO Configuration Tool gives users the ability to customize and optimize settings for their specific environment to maximize the performance of the storage connection. While the factory settings provide excellent performance for a wide range of applications, some specialized applications may benefit from fine-tuning the adapter settings for a specific performance range. The ATTO Configuration Tool is a simple way to get the most out of your ATTO host adapter.
- **Advanced Drivers** – ATTO host adapters take driver development to a new level. Containing much of the intelligence required to reliably exchange data between the adapter and storage, ATTO's field tested drivers deliver the functionality and performance customers need. With support for multiple OS platforms and the ability to deliver customizable OEM solutions such as target mode and multipathing, ATTO's driver support rises above the competition.

Not all host adapters are alike. ATTO host adapters are engineered with distinctive intelligence that makes them the premier choice for transferring data with greater speed and reliability.

ATTO Host Adapters

Celerity Fibre Channel

CTFC-84EN-000	8Gb/s	PCIe 2.0	Quad Channel
CTFC-82EN-000	8Gb/s	PCIe 2.0	Dual Channel
CTFC-81EN-000	8Gb/s	PCIe 2.0	Single Channel
CTFC-44ES-ORO	4Gb/s	PCIe	Quad Channel
CTFC-42ES-ORO	4Gb/s	PCIe	Dual Channel
CTFC-41ES-ORO	4Gb/s	PCIe	Single Channel
CTFC-42XS-ORO	4Gb/s	PCI-X	Dual Channel
CTFC-41XS-ORO	4Gb/s	PCI-X	Single Channel

ExpressSAS SAS/SATA

ESAS-H6FO-000	6Gb/s	PCIe 2.0	16 External Ports
ESAS-H60F-000	6Gb/s	PCIe 2.0	16 Internal Ports
ESAS-H680-000	6Gb/s	PCIe 2.0	8 External Ports
ESAS-H608-000	6Gb/s	PCIe 2.0	8 Internal Ports
ESAS-H644-000	6Gb/s	PCIe 2.0	4 Internal / 4 External Ports
ESAS-H30F-000	3Gb/s	PCIe	16 Internal Ports
ESAS-H380-000	3Gb/s	PCIe	8 External Ports
ESAS-H308-000	3Gb/s	PCIe	8 Internal Ports

ExpressPCI SCSI

EPCH-UL5D-ORO	Ultra320	PCIe	Dual Channel
EPCH-UL5D-LOO	Ultra320	PCIe	Dual Channel
EPCH-UL4D-ORO	Ultra320	PCI-X	Dual Channel

ATTO RAID Adapters

ExpressSAS SAS/SATA

ESAS-R60F-000	6Gb/s	PCIe 2.0	16 Internal Ports
ESAS-R680-000	6Gb/s	PCIe 2.0	8 External Ports
ESAS-R608-000	6Gb/s	PCIe 2.0	8 Internal Ports
ESAS-R644-000	6Gb/s	PCIe 2.0	4 External / 4 Internal Ports
ESAS-R30F-000	3Gb/s	PCIe	16 Internal Ports
ESAS-R380-000	3Gb/s	PCIe	8 External Ports
ESAS-R348-000	3Gb/s	PCIe	4 Internal / 4 External or 8 Internal Ports



8Gb & 4Gb Fibre Channel Host Adapters

Celerity Host Adapters

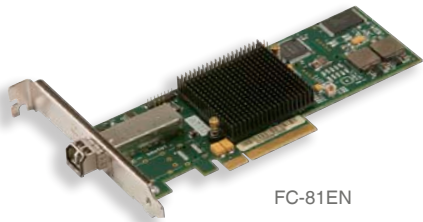
- **Advanced Architecture** — Don't settle for just any host adapter. Celerity Fibre Channel host adapters incorporate industry-standard components into a unique architecture to deliver a robust and scalable connectivity solution. Celerity offers a highly integrated family of adapters designed to transfer data efficiently and flawlessly using a combination of features that enhance the data delivery process. ATTO's attention to detail in board design, specifically signal quality, ensures reliable connectivity. This exceptional design minimizes data corruption, reduces transmission errors, and protects other system components from harmful interference.

Celerity Fibre Channel Host Adapters help solve advanced storage connectivity challenges by offering high-end features such as multipathing for failover and load balancing in clustered applications with select storage vendors.

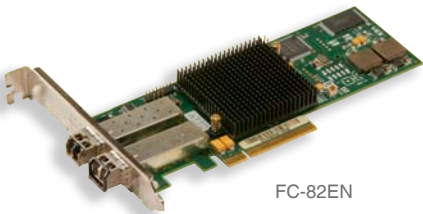


FC-84EN

- **Industry Proven Performance** — ATTO's commitment to Fibre Channel technology and storage area networking began over 10 years ago and continues with first-to-market products that include the latest performance levels and features. ATTO Celerity Fibre Channel Host Adapters deliver performance, reliability and connectivity with a wide range of port options, OS support and proven industry certifications and interoperability.



FC-81EN



FC-82EN

Common Features:

- Advanced Data Streaming (ADSTM) Technology
- Support for Windows®, Linux, Mac®, VMware® (4Gb ES/XS models support Novell NetWare, Solaris, and FreeBSD)
- Strict adherence to ANSI Fibre Channel standards
- Supports arbitrated loop, point-to-point and direct fabric/switch attach
- Software RAID support – available with ATTO Power Center software
- Pluggable optical LC SFP or SFP+ (8Gb) included
- Fully compatible with ATTO FibreConnect™ Fibre Channel switches
- ATTO Configuration Tool for customized performance settings
- Low power consumption



ATTO Celerity Host Adapters				
Product Features	84EN	82EN	81EN	44ES
Fibre Channel Ports	4	2	1	4
Max. Data Rate	8Gb/s	8Gb/s	8Gb/s	4Gb/s
Max. Transfer Rate (Full Duplex) (Half Duplex)	6.4GB/s 3.2GB/s	3.2GB/s 1.6GB/s	1.6GB/s 800MB/s	3.2GB/s 1.6GB/s
Bus Type	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8	PCIe x8
Auto Negotiation	8Gb, 4Gb, 2Gb	8Gb, 4Gb, 2Gb	8Gb, 4Gb, 2Gb	4Gb, 2Gb, 1Gb
Optical Interface	SFP+LC	SFP+LC	SFP+LC	SFP LC
Max. Cable Length	300m - 2Gb 150m - 4Gb 50m - 8Gb	300m - 2Gb 150m - 4Gb 50m - 8Gb	300m - 2Gb 150m - 4Gb 50m - 8Gb	300m - 2Gb 150m - 4Gb
Low-Profile Form Factor	—	Yes	Yes	—
Developer's Kit* (Target Mode API)	Yes	Yes	Yes	Yes
ADS™ Technology	Yes	Yes	Yes	Yes
Product Features	42ES	41ES	42XS	41XS
Fibre Channel Ports	2	1	2	1
Max. Data Rate	4Gb/s	4Gb/s	4Gb/s	4Gb/s
Max. Transfer Rate (Full Duplex) (Half Duplex)	1.6GB/s 800MB/s	800MB/s 400MB/s	1.6GB/s 800MB/s	800MB/s 400MB/s
Bus Type	PCIe x4	PCIe x4	PCI-X 64-Bit, 133 MHz	PCI-X 64-Bit, 133 MHz
Auto Negotiation	4Gb, 2Gb, 1Gb	4Gb, 2Gb, 1Gb	4Gb, 2Gb, 1Gb	4Gb, 2Gb, 1Gb
Optical Interface	SFP LC	SFP LC	SFP LC	SFP LC
Max. Cable Length	300m - 2Gb 150m - 4Gb	300m - 2Gb 150m - 4Gb	300m - 2Gb 150m - 4Gb	300m - 2Gb 150m - 4Gb
Low-Profile Form Factor	Yes	Yes	Yes	Yes
Developer's Kit* (Target Mode API)	Yes	Yes	Yes	Yes
ADS™ Technology	Yes	Yes	Yes	Yes

Part Numbers - See page 3

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

6Gb & 3Gb SAS/SATA RAID Adapters

ExpressSAS RAID Adapters

ExpressSAS RAID adapters add high-performance parity RAID data protection to direct attached SAS and SATA JBOD storage. ExpressSAS RAID adapters include ATTO's field proven hardware-based RAID technology and DriveAssure™ Technology (see pg. 21) that manages latency and prevents premature drive failures. DriveAssure provides uninterrupted access to data and enables systems to run longer, faster and smoother.



R380

- **Outperforms the Competition** — ATTO's RAID adapters are designed to deliver industry leading performance. ExpressSAS RAID adapters maintain full performance levels when operating in degraded mode and provide 50% faster rebuild times to minimize downtime and help users meet project deadlines.

ExpressSAS RAID adapters provide users with the flexibility to connect to both tape and disk storage. With pass-through mode, ATTO's RAID adapters maximize PCIe slots by simultaneously providing RAID protection for disk storage and support for SAS-connected tape drives.

- **Reliable Connectivity** — ExpressSAS RAID adapters provide the ultimate accessibility to data with CacheAssure™ technology. CacheAssure safeguards against the loss of cached data during a power or system failure for up to 10 years. This environmentally-friendly and maintenance free backup solution minimizes downtime and eliminates the hassles associated with purchasing, maintaining and disposing of batteries. (Available on all 6Gb/s RAID adapters and FastStream 8200/8500)

Common Features:

- Advanced Data Streaming (ADST™) Technology
- DriveAssure™ and CacheAssure™
- Data Recovery Mode
- Support for Windows®, Linux, Mac®
- Time-tested ATTO RAID stack
- RAID levels 0, 1, 4, 5, 6, 10, 40, 50, 60, JBOD and DVRAID™
- Global hot spares
- Easy-to-use GUI configuration utility
- Defective drive sector scanning and repair
- Tunable rebuilds allow full application performance in degraded or rebuild mode
- Online capacity expansion
- RAID group partitioning
- Up to 512 MB ECC protected DDR2 memory
- SES monitoring and SNMP support
- Staggered drive spin-up
- Pass-through mode for non-block devices (SAS TAPE)
- RAID management utility
- Event notification via email, pop-up, and log file
- Low power consumption



ATTO ExpressSAS RAID Adapters				
Product Features	R60F	R680	R608	R644
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 (Full Duplex) (Half Duplex)	9.6GB/s 4.8GB/s	9.6GB/s 4.8GB/s	9.6GB/s 4.8GB/s	9.6GB/s 4.8GB/s
Bus Type	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8
Auto Negotiation	SAS 2.0, SAS, SATA II, SATA	SAS 2.0, SAS, SATA II, SATA	SAS 2.0, SAS, SATA II, SATA	SAS 2.0, SAS, SATA II, SATA
Connector Type	4 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)	512MB	512MB	512MB	512MB
ADS™ Technology	Yes	Yes	Yes	Yes
Product Features	R30F	R380	R348	
SAS/SATA Ports	16	8	8	
Port Config. (Ext./Int)	0/16	8/0	User Selectable 4/4 or 0/8	
Max. Data Rate	3Gb/s	3Gb/s	3Gb/s	
Max. Transfer Rate (Full Duplex) (Half Duplex)	4.8GB/s 2.4GB/s	4.8GB/s 2.4GB/s	4.8GB/s 2.4GB/s	
Bus Type	PCIe x8	PCIe x8	PCIe x8	
Auto Negotiation	SAS, SATA II, SATA	SAS, SATA II, SATA	SAS, SATA II, SATA	
Connector Type	4 mini SAS (x4) SFF 8087 Internal	2 mini SAS (x4) SFF 8088 External	1 mini SAS (x4) SFF 8088 External, 2 mini SAS (x4) SFF 8087 Internal	
Max. Cable Length SAS/SATA	8m/1m	8m/1m	8m/1m	
Low-Profile Form Factor	Yes	Yes	Yes	
End Devices Supported	128	128	128	
Memory (ECC)	512MB	256MB	256MB	
ADS™ Technology	Yes	Yes	Yes	

Part Numbers - See page 3

6Gb & 3Gb SAS/SATA Host Adapters

ExpressSAS Host Adapters

- **Experience and Innovation** — ATTO is an industry leader and was the first to market with 6Gb/s and 3Gb/s SAS/SATA Host Adapters. These time tested and proven products are sure to enhance the overall performance of your system.
- **High Performance** — ExpressSAS Host Adapters leverage the performance and scalability enhancements of Serial Attached SCSI (SAS) technology to deliver the fastest available connection to SAS/SATA storage. ATTO continues to push the boundaries of connectivity with its introduction of the industry's first 6Gb/s SAS host adapter line that boasts an impressive 1200MB/s per port performance – there's no other SAS HBA like it.



H308 & H644



H6F0

- **Tape and Disk Support** — ATTO has engineered the ultimate in host adapter flexibility by offering customers a reliable Direct Attached Storage connectivity solution that is interoperable with a wide range of internal disk and external tape products.
- **Multiple Configurations** — ExpressSAS products support SAS, SAS 2.0 (6Gb/s), SATA and SATA II technology. With a full range of port configurations and driver support, easy-to-use features, extensive industry qualifications and support for up to 512 end devices, ATTO has an ExpressSAS product designed to meet your performance needs.

Common Features:

- Advanced Data Streaming (ADS™) Technology
- Support for Windows®, Linux, Mac®, VMware®
- Protocol support: SAS 2.0 (6Gb only), SAS, SATA II, SATA
- Compatible with all major SAS, SATA, SSD and tape drives
- ATTO Configuration Tool for customized performance settings
- Low power consumption



ATTO ExpressSAS Host Adapters				
Product Features	H6FO	H60F	H680	H608
SAS/SATA Ports	16	16	8	8
Port Config. (Ext./Int)	16/0	0/16	8/0	0/8
Max. Data Rate	6Gb/s	6Gb/s	6Gb/s	6Gb/s
Max. Transfer Rate (Full Duplex) (Half Duplex)	19.2GB/s 9.6GB/s	19.2GB/s 9.6GB/s	9.6GB/s 4.8GB/s	9.6GB/s 4.8GB/s
Bus Type	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8
Auto Negotiation	SAS 2.0, SAS, SATA II, SATA	SAS 2.0, SAS, SATA II, SATA	SAS 2.0, SAS, SATA II, SATA	SAS 2.0, SAS, SATA II, SATA
Connector Type	4 Mini SAS (x4) SFF 8088 External	4 Mini SAS (x4) SFF 8087 Internal	2 Mini SAS (x4) SFF 8088 External	2 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
Developer's Kit* (Target Mode)	Yes	Yes	Yes	Yes
End Devices Supported	512	512	256	256
ADSTM Technology	Yes	Yes	Yes	Yes
Product Features	H644	H30F	H380	H308
SAS/SATA Ports	8	16	8	8
Port Config. (Ext./Int)	4/4	0/16	8/0	0/8
Max. Data Rate	6Gb/s	3Gb/s	3Gb/s	3Gb/s
Max. Transfer Rate (Full Duplex) (Half Duplex)	9.6GB/s 4.8GB/s	4.8GB/s 2.4GB/s	4.8GB/s 2.4GB/s	4.8GB/s 2.4GB/s
Bus Type	PCIe 2.0 x8	PCIe x8	PCIe x8	PCIe x8
Auto Negotiation	SAS 2.0, SAS, SATA II, SATA	SAS, SATA II, SATA	SAS, SATA II, SATA	SAS, SATA II, SATA
Connector Type	1 Mini SAS (x4) SFF 8088 External 1 Mini SAS (x4) SFF 8087 Internal	4 Mini SAS (x4) SFF 8087 Internal	2 Mini SAS (x4) SFF 8088 External	2 Mini SAS (x4) SFF 8087 Internal
Max. Cable Length SAS/SATA	10m/1m	8m/1m	8m/1m	8m/1m
Low-Profile Form Factor	Yes	Yes	Yes	Yes
Developer's Kit* (Target Mode)	Yes	—	—	—
End Devices Supported	256	256	256	256
ADSTM Technology	Yes	Yes	Yes	Yes

Part Numbers - See page 3

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

Ultra320 SCSI Host Adapters

ExpressPCI Host Adapters

Engineered for performance and reliability, ATTO's ExpressPCI host adapters leverage our 20 years of experience with storage connectivity to deliver a field tested and time proven SCSI host adapter.

- **Perfect for Tape & External Storage** —

The ExpressPCI SCSI host adapter family is designed to complement high-performance Direct Attached Storage (DAS) configurations in multiple environments by providing a flexible solution for the most discriminating storage consumer. Proprietary technologies, such as ADS™ and Power Center software, maximize the performance and efficiency of ExpressPCI host adapters, providing ATTO with a clear advantage over the competition.

- **Easy to Use** —

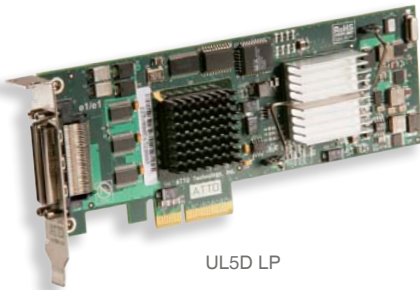
ExpressPCI SCSI host adapters boast the broadest range of certifications and driver support ensuring that your storage connection will work right the first time with easy setup and configuration. With reliability, speed and performance, ATTO SCSI host adapters are the best choice for SCSI connectivity. Buy an ATTO HBA — it just works.



UL4D

Common Features:

- Advanced Data Streaming (ADS™) Technology
- Support for Windows®, Linux, Mac®, Novell NetWare
- Low Voltage Differential
- Single-ended SCSI
- Supports 30 SCSI IDs
- Large file transfers
- 12-meter cable distance
- ATTO Configuration Tool for customized performance settings
- Low power consumption



UL5D LP



ATTO ExpressPCI Host Adapters			
Product Features	UL5D	UL5D LP	UL4D
SCSI Channels (Ext/Int)	2/2	2/0	2/2
SCSI Protocol	Ultra320	Ultra320	Ultra320
Max. Transfer Rate	640MB/s	640MB/s	640MB/s
Bus Type	PCIe x4	PCIe x4	PCI-X 64-bit, 133MHz
Auto Negotiation	Ultra320, Ultra 160, Ultra2, Ultra/WIDE	Ultra320, Ultra 160, Ultra2, Ultra/WIDE	Ultra320, Ultra 160, Ultra2, Ultra/WIDE
Max. Cable Length	12m	12m	12m
Low-Profile Form Factor	—	Yes	—
Developer's Kit* (Target Mode)	Yes	Yes	Yes
ADS™ Technology	Yes	Yes	Yes

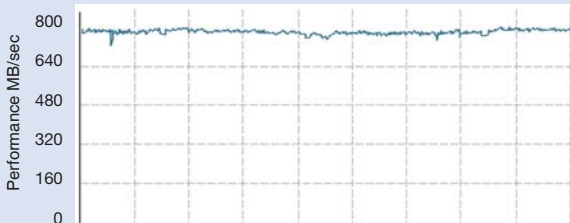
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ADS™ Technology

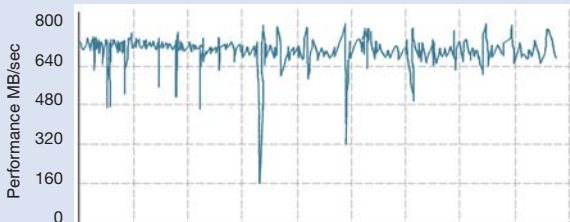
ATTO products feature Advanced Data Streaming (ADS™) Technology that manages latency by providing controlled acceleration for smooth data streaming to maintain the highest consistent performance. ADS Technology ensures best-in-industry data transfers for high-bandwidth applications.

ATTO Products with ADS™ Technology



Data transfer performance is smooth and reliable

Competitors Product



Disrupted transfer with peaks and drops
Transfer rate dips below optimal performance levels

8Gb Fibre Channel Switches

FibreConnect Switches



FibreConnect 8324

- **Advanced Workflow Performance** — The FibreConnect™ line of switches combine high-performance connectivity with exclusive latency management features. This combination ensures smooth and reliable data transfer on the SAN, a critical requirement for high-bandwidth video streaming or backup applications. With up to 192Gb/s of uncongested throughput and Inter-Switch Link (ISL) trunking capability, FibreConnect switches streamline workflow processes to allow users to interconnect and share media resources
- **Fast and Easy SAN Scalability** — The FibreConnect family of switches integrate innovative hardware and software features that make it easy to manage and deploy into a wide range of video and IT environments. With powerful and flexible Ports-On-Demand scalability from 8 to 16 or 24 ports in 8-port increments, FibreConnect allows organizations to start small and grow their storage networks in a non-disruptive manner.
- **Simplified Management** — FibreConnect switches are easy to setup and configure with the Web Tools interface, making switch configuration, deployment and management an easy process. The FibreConnect self-configuring switch ports adjust to match device speeds and allows for firmware updates and error logging to increase overall serviceability.

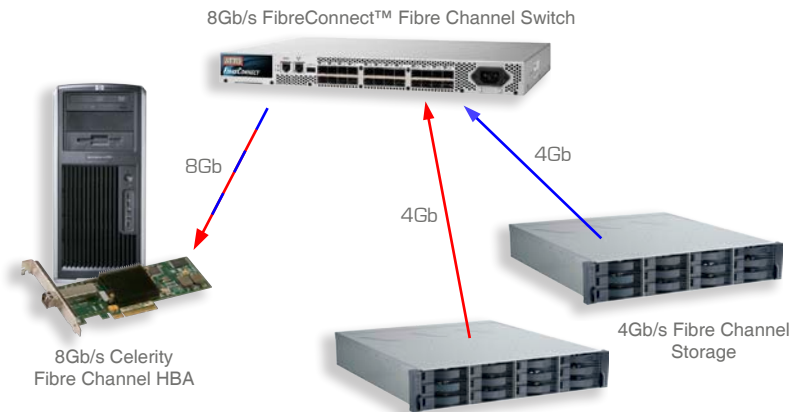
Common Features:

- High-Performance 8Gb/s Fibre Channel connectivity
- Affordable foundation for small to mid-range SANs
- Ports-On-Demand scalability (8 to 16 to 24)
- Web Tools interface simplifies configuration and management
- Dual functionality: SAN switch or NPIV-enabled gateway
- Pluggable optical LC SFP+ included
- Supports 2, 4, and 8Gb/s devices
- Inter-Switch Link (ISL) trunking for larger aggregate bandwidth)
- Extensive ATTO and Brocade interoperability with video and IT vendors
- Complete SAN connectivity solution when combined with Celerity Fibre Channel HBAs
- Advanced diagnostics
- Low power consumption
- Mounting hardware included
- 1 year warranty

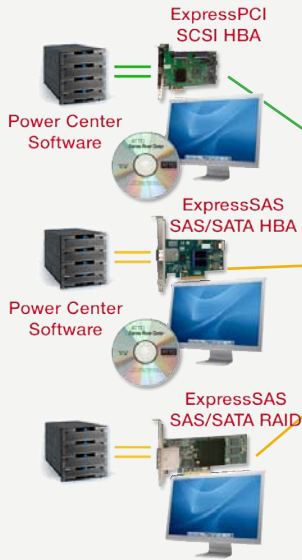


ATTO FibreConnect Switches			
Product Features	8324	8316	8308
Fibre Channel Ports	24	16	8
Max. Data Rate	8Gb/s	8Gb/s	8Gb/s
Aggregate Bandwidth	192Gb/s	128Gb/s	64Gb/s
Auto-Sensing	2, 4, 8Gb/s	2, 4, 8Gb/s	2, 4, 8Gb/s
Form Factor	1U	1U	1U
Low Power <2.5W/Port	Yes	Yes	Yes
Web Tools	Yes	Yes	Yes
Part Number	FCSW-8324-D00	FCSW-8316-D00	FCSW-8308-D00

Use Case: Building an 8Gb/s Fibre Channel SAN with 4Gb/s Storage



When combining an ATTO 8Gb/s Celerity Fibre Channel host adapter, an ATTO 8Gb/s FibreConnect Fibre Channel switch and 4Gb/s Fibre Channel storage, you can obtain the full performance of an 8Gb/s HBA (800MB/s) when aggregating the performance over two 4Gb/s storage devices. ATTO offers media and entertainment and general IT users a completely scalable end-to-end SAN connectivity solution to deliver high-performance and reliable storage solutions.

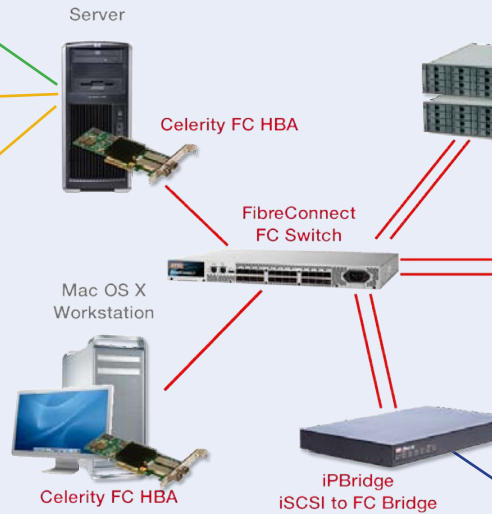


Direct Attached Storage

Achieve maximum performance from SCSI and SAS/SATA storage providing fast access to critical data. Instantly add RAID to SAS or SATA JBOD storage to protect your data without compromising performance.

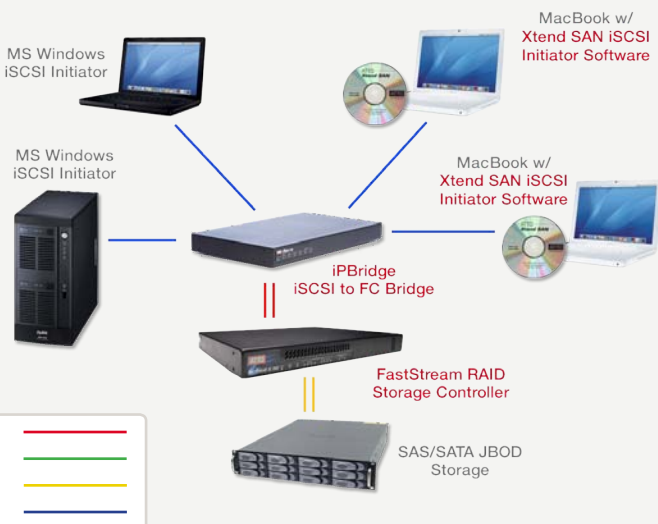
Fibre Channel SAN

ATTO products provide a reliable foundation for SAN environments. ATTO components are interoperable with tape and disk storage, workstation, and video hardware.

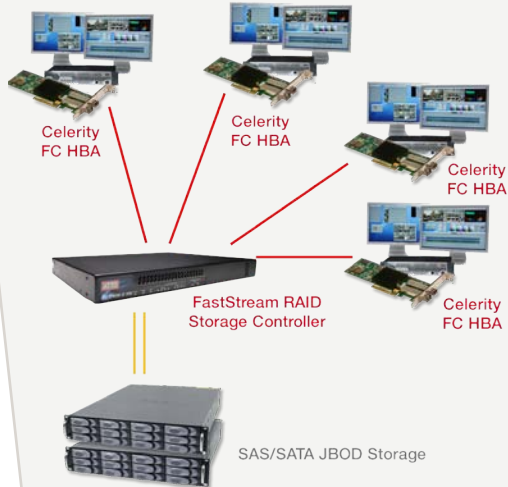
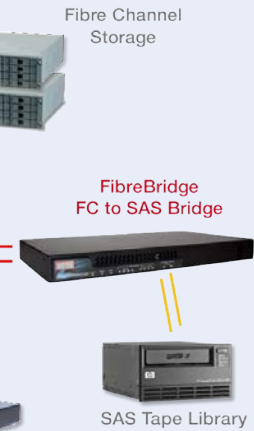


Small Workgroup - iSCSI SAN

Easy to install and simple to maintain, iSCSI SANs make an ideal shared storage solution that easily accommodates all of your computing platforms.

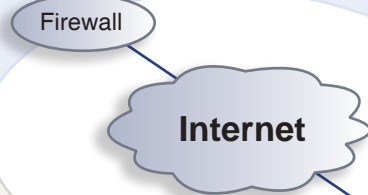


LAN connectivity and work
 ance for bandwidth-intensive
 le with industry leading server,
 rdware and software vendors.



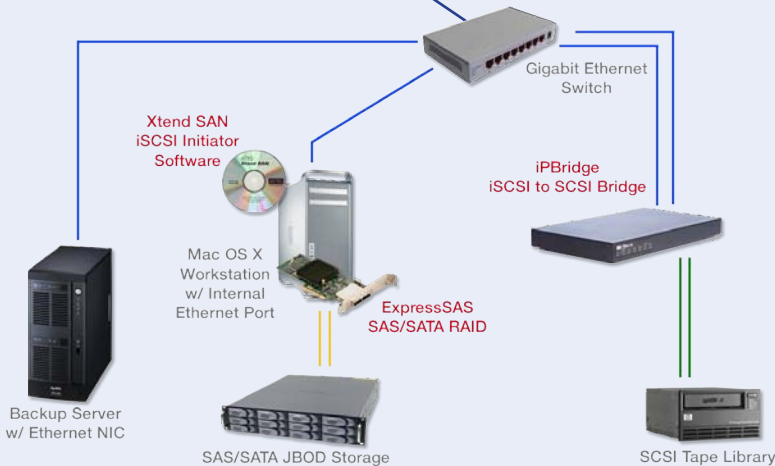
Small Workgroup - Shared Storage

ATTO's FastStream™ allows you to connect up to 4 workstations without the expense of a Fibre Channel switch to create a RAID-protected, high-performance collaborative workflow.



iSCSI SAN

Connect to local or remote storage over standard Ethernet networks or over the Internet, as though they were locally attached devices.



iSCSI-to-FC & iSCSI-to-SCSI Bridges

iPBridge™ Products



2600 1U Desktop/Rackmount

The ATTO iPBridge™ iSCSI-to-Fibre Channel and iSCSI-to-SCSI bridge product family offers organizations an affordable solution to connect their storage over an Ethernet network or to interconnect IP and Fibre Channel Storage Area Networks (SANs). The iPBridge makes the process of developing a SAN easier through the use of familiar Ethernet technology. The result is a low-cost storage router interface for SCSI and Fibre Channel storage devices.



2600 4U cPCI
Embeddable

Common Features:

- Near wire speed (99.5%) sustained throughput
- Access Control Lists (ACL) limit storage access to defined users
- Virtual LAN (VLAN) enhances security while lessening the effort associated with managing larger networks
- Multipathing support on iSCSI and Fibre Channel links
- 10/100 Ethernet management port for LAN-based monitoring and management
- Microsoft®, Linux, Mac® (ATTO Xtend SAN) iSCSI initiator compliance
- ExpressNAV™ web-based GUI simplifies management, monitoring and diagnostics
- Intelligent Bridging Architecture™ optimizes performance while enabling advanced features such as SpeedWrite™ and VDR
- SpeedWrite™ manages write cache to improve performance
- Virtual Drive Response (VDR) improves reliability by reducing failed and incomplete backups
- Error recovery support
- RS-232 serial port with DB9 connector for local monitoring and management (desktop/rack mount only)
- Virtual Device Architecture – OEM customizable features
- Email notification of errors
- Advanced diagnostics
- Available as an OEM embeddable board



iPBridge:

- Advanced error processing for tape devices
- Makes direct-attached Fibre Channel or SCSI storage available to multiple servers and laptop computers
- Interconnect Fibre Channel and iSCSI SANs
- Simplifies storage management through a common interface
- Consolidates storage and reduces operational costs, minimizing or delaying future capital expenditures
- Provides the ability to aggregate storage resources into storage pools that can be managed as a single collection of storage components
- Supports all SCSI and FC storage devices including RAID arrays, JBOD, hard disk drives, tape libraries, tape drives, RAID controllers, DVD, MO and CD libraries

ATTO iP Bridges		
Product Features	2700	2600
Input Connectors	4 1GbE iSCSI	4 1GbE iSCSI
Output Connectors	2 4Gb FC (SFP)	2 Ultra320 SCSI
Max. Transfer Rate	400MB/s	400MB/s
Active Initiators Supported	50	50
Form Factor - Embedded	4U cPCI	4U cPCI
Form Factor - Desktop/Rackmount	1U	1U
OEM Embedded Option	Yes	Yes
Part Number	IPBR-2700-DRO	IPBR-2600-DRO

intelligent Bridging Architecture™

ATTO's intelligent Bridging Architecture technology combines powerful hardware with an efficient software data engine delivering valuable features with the flexibility of "anything-to-anything" connectivity. ATTO bridge and controller products are engineered to effectively transfer data with minimal overhead from multiple combinations of protocols, custom applications, and specification requirements to match customer configurations.

Virtual Device Manager (VDM) is a proprietary software architecture that uses portable objects to manage data flow between different types of SAN devices. VDM is designed to minimize overhead by

creating a virtual link between initiators and targets on a per-command basis. Once this virtual link is established, VDM can burst data and take full advantage of all available hardware acceleration.

ATTO Data Routing Fabric is a topology incorporating advanced ASIC, firmware, and interface technologies that enable users to configure ATTO bridges and controllers to specific operating environments.

Combined, these technologies create ATTO's intelligent Bridging Architecture that goes beyond the standard to deliver customers' needs for a total system approach to storage connectivity and infrastructure management.

FC-to-SAS & FC-to-SCSI Bridges

FibreBridge™ Products



6500 1U Desktop/Rackmount

ATTO FibreBridge™ products are engineered with an advanced architecture which provides industry-leading performance by utilizing the latest hardware technology combined with ATTO's intelligent bridging architecture™. The FibreBridge provides increased availability

and scalability for SAS, SATA or SCSI disk or tape technologies allowing for a more efficient utilization of storage. This allows organizations to migrate to Fibre Channel technology without purchasing new storage systems.

Common Features:

- ExpressNAV™ System Manager simplifies management, monitoring and diagnostics
- intelligent Bridging Architecture™ optimizes performance with minimal overhead
- SpeedWrite™ manages write cache to improve performance
- Virtual Drive Response (VDR) improves reliability by reducing failed and incomplete backups
- Manual and auto LUN mapping for flexible management
- Ethernet management port for remote monitoring and management
- Auto-negotiates to slower Fibre Channel speeds
- Full support for full-duplex Fibre Channel data transfers
- Error Recovery Support
- Error Checking Cache (ECC) Memory
- Virtual Device Architecture moves data quickly and efficiently
- Email notification of errors
- Persistent event log to assist troubleshooting
- Advanced diagnostics and debug tools
- RS-232 serial connector for command line interface access
- Pluggable optical SFP/SFP+ connectors included
- OEM software and hardware configuration options



FibreBridge:

- Advanced error processing for tape devices
- Share direct attached disk storage across a Fibre Channel SAN
- Simplifies storage management
- Provides the ability to aggregate storage resources into storage pools that can be managed from a single management interface
- Supports all storage devices including RAID arrays, RAID controllers, JBODs, hard disk drives, solid state drives, tape libraries, tape drives, DVD, MO and CD libraries
- Available with a broad selection of certifications and interoperability



2400 4U cPCI
Embeddable

ATTO FibreBridges		
Product Features	2400	6500
Input Connectors	2 4Gb FC (SFP)	2 8Gb FC (SFP+)
Output Connectors	2 Ultra320 SCSI	2 6Gb SAS (QSFP+)
Max. Transfer Rate	480MB/s	1200MB/s
Devices Supported	64	255
Active Initiators Supported	64	64
Event Log Protection	Battery	NVRAM
Form Factor	4U cPCI, 1U Desktop	1U Desktop
OEM Embedded Option	Yes	No*
Part Number	FCBR-2400-DRO	FCBR-6500-D00

*Call for availability

RAID Storage Controllers

FastStream™ SC Products



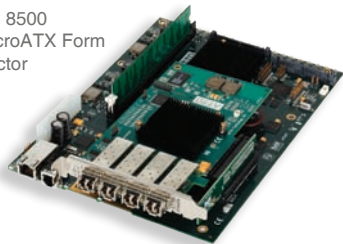
SC 8200 1U Desktop/Rackmount

ATTO's FastStream™ Storage Controllers are engineered for real-time applications which require managed latency for high-performance collaborative workflows. FastStream provides for critical storage needs including: enhancing system performance, allowing shared storage, providing data protection and providing scalability for future growth.

Simply connect a FastStream SC between your workstations or server and JBOD(s) to instantly add RAID protection while creating a storage area network without expensive Fibre Channel SAN components.

FastStream storage controllers are designed for applications that demand high-performance storage without the complexity of a traditional Fibre Channel SAN. With features like one-click installation via a web-based interface and RAID tuned to your application, FastStream is an easy-to-use storage solution. As your need for storage capacity increases, simply add another JBOD – a much more affordable solution than purchasing multiple RAID storage arrays – and all of your storage can be managed through the FastStream.

SC 8500
MicroATX Form
Factor



Common Features:

- RAID levels 0, 1, 4, 5, 6, 10, 40, 50, 60, JBOD, DVRAID™, N-way mirroring
- Dedicated and global hot spares
- Tunable rebuilds allow full application performance in degraded or rebuild mode
- Advanced Data Streaming (ADS™) Technology
- DriveAssure™ and CacheAssure™ Technology
- Data Recovery Mode
- Defective drive sector scanning and repair
- CLI, Telnet and FTP via Gig-E or RS-232
- ExpressNAV™ GUI simplifies management, monitoring and diagnostics
- “One-Click” install screen provides options for video, audio, database, general IT and customized quick setup
- Advanced and express initialization
- Supports host-based failover and load balancing (Multipathing)
- Online capacity expansion
- 8KB-1MB interleave support
- 512B-8KB variable sector size
- Advanced drive diagnostics, drive health and performance monitoring
- SCSI Enclosure Services (SES)
- Pass-through mode for non-block devices (Tape)
- OEM customizable features
- Event notification via email alerts and battery backed log file



FastStream:

- The FastStream SC family is engineered to be interoperable with a number of storage products allowing you to purchase one brand of storage and add others as your needs grow. There are no operating system requirements for the FastStream, just connect it and in minutes your storage will be networked and protected.
- The FastStream SC advanced storage platform incorporates the latest processor technology providing best-of-class performance. Additionally, multiple storage interfaces offer flexibility in choice of storage solutions.

ATTO FastStream SC			
Product Features	8500	8200	5500
Max. Sustained Transfer Rate	1400MB/s	1000MB/s	650MB/s
Input Connectors	4 8Gb FC	16 6Gb SAS	2 4Gb FC
Output Connectors	8 3Gb SAS/SATA	8 3Gb SAS/SATA	8 3Gb SAS/SATA
Devices Supported	128	128	64
10-Bit HD Streams Supported	6	3	3
ECC Cache Memory	1024MB	1024MB	512MB
Form Factor - MicroATX	178mm x 244mm	178mm x 244mm	178mm x 244mm
Form Factor - Desktop/Rackmount	1U	1U	1U
OEM Embedded Option	Yes	Yes	Yes
Part Number	FSSC-8500-D00	FSSC-8200-D00	FSSC-5500-D00

Use Case: Cost-Effective, Small Workgroup SAN... *see page 22*

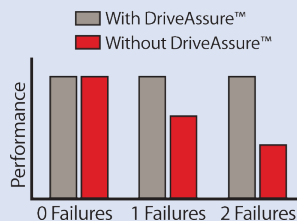
Use Case: High-Performance, Medium Workgroup SAN... *see page 23*

DriveAssure™ Technology

ATTO RAID adapters and storage controllers feature DriveAssure™ drive assessment and latency management technology. Providing bounded latency through proprietary algorithms and user controls to prevent premature drive failures and slow downs ensuring uninterrupted access to data. Through periodic drive scans, DriveAssure searches for bad sectors or slow spots and repairs them without failing the drive, preventing the loss of critical assets.

- Guaranteed latency response from RAID groups
- Media scrubbing during drive initialization
- Manual and scheduled media scans with parity verification
- On-the-fly media error handling
- Rebuilds continue when an error occurs

Drive Failure Rate

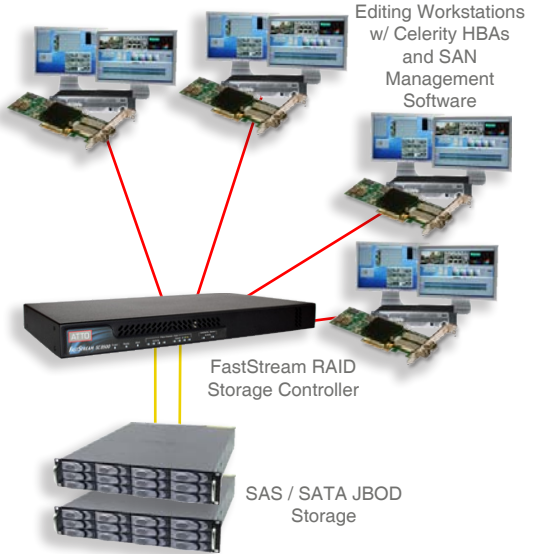


Use Case: FastStream™ SC

Cost-Effective, Extremely Efficient Small Workgroup SAN

FastStream RAID Storage Controllers are designed to sit between workstations and low-cost JBOD disk storage, providing users the ability to scale their performance and storage capacity without purchasing a RAID controller every time expansion is needed. The FastStream is well-suited for shared applications in IT and digital media infrastructures including digital film production, post-production, imaging, digital prepress, disk-to-disk backup, audio production and transaction-based environments.

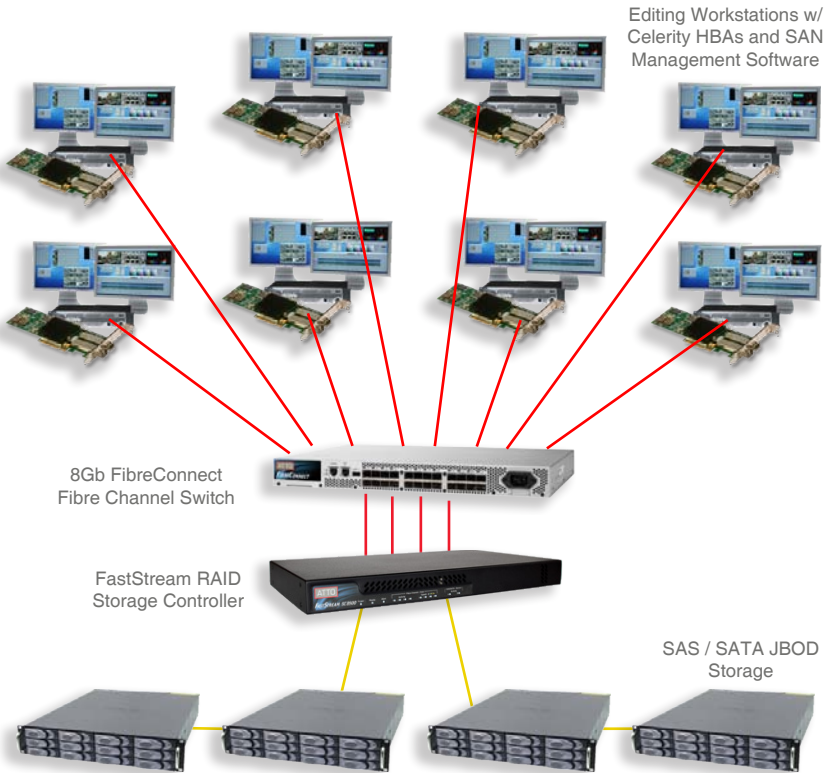
By combining FastStream and SAN management software with low cost JBOD storage, video/audio production studios can create a shared collaborative workgroup environment that enables the rapid development and completion of projects within budget and time constraints.



Feature	Benefit
High bandwidth/throughput	<ul style="list-style-type: none"> ADSTM Technology manages latency for real-time high-performance streaming applications such as video editing and data backup as well as heavy access database applications
RAID-protected data	<ul style="list-style-type: none"> Instantly add parity protection to storage and ensure your data is protected without compromising performance In the event of drive failure, ATTO's RAID ensures full performance and continued operation during a drive rebuild.
Drive utilities	<ul style="list-style-type: none"> DriveAssure performs predictive and corrective actions that enable your storage to run longer, faster and smoother and provides continued operation of marginal drives for uninterrupted access to data Media Scan provides drive initialization and verification for advanced notification of drive errors or performance issues
'On-the-fly' capacity expansion	<ul style="list-style-type: none"> New drive(s) can be appended to existing storage groups at any time to allow capacity expansion
SAN connectivity	<ul style="list-style-type: none"> Create a small workgroup SAN without an expensive switch Fibre Channel host interfaces also make FastStream ideal for larger SAN installations that require a switch
Advanced configuration and management tools	<ul style="list-style-type: none"> Simple 'One Click' configuration takes the guesswork out of setup and installation and automatically optimizes for most application environments Simplifies administration while providing seamless integration into an existing storage management process

Use Case: FastStream™ SC

High Performance, Low Latency Medium Workgroup SAN



The FastStream Storage Controller has the ability to scale upward in both storage capacity and workstation connectivity. Have peace of mind in knowing that the FastStream will scale as you grow to meet your current and future needs. Start small with three to four workstations and scale

up to 16 workstations and eight 16-bay JBOD storage enclosures. With its class-leading performance and free firmware updates, FastStream will also provide you with new features as they are developed, all while helping improve your workflow.



SC 8500 1U Desktop/Rackmount

Host Adapters

RAID Adapters

Switches

ATTO Solutions

Bridges

RAID Controllers

Software

Cables / Accessories

ExpressNAV™ Storage Manager

Monitoring, Management and Notification Utility for FastStream Products

The FastStream is designed with sophisticated, user-friendly features to help manage your storage, making setup, monitoring and management simple and easy-to-use.

Quick Setup

The ExpressNAV remote management interface will have you up and running in only five minutes with just a few clicks—no need for specialized IT personnel. FastStream setup features include:

- “One-Click” setup wizards for video, audio, database and general IT environments
- QuickNAV™ device discovery to manage other networked ATTO products from one GUI
- Naming feature to easily identify your storage remotely
- Custom setup option for advanced performance tuning
- OEM customization available

ATTO
ATTO Technology, Inc.

ATTO FASTSTREAM SC

INITIAL SETUP

FastStream SC Management

- Initialize and Verify Drives
- System Configuration

RAID Group Setup

- Digital Video
- Audio
- General IT
- Database
- Custom Setup

Description : Initialize and Verify Drives writes a pattern to the drives and reads it back to identify serious failures and "soft" errors on your drives.

It is recommended that you initialize and verify all drives at initial setup and when new drives are added to minimize disk errors during normal operation.

Click [Next>>](#) button at bottom of screen to continue.

EXPRESS NAV

Next >>

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Managing your storage has never been easier.

RAID SETUP WIZARD

Step 14: Verify the setup

RAID Group			
Name	Level	# Drives	Capacity
raid5set	RAID5	3	149.08 GB

RAID Group Options						
Initialization	Interleave	Sector Size	SpeedRead	Prefetch	Auto-Rebuild	Rebuild Priority
Express	64.0KB	512B	Auto	0	disabled	Equal

RAID Group Partitions		
Partition #	Size	Port 1 LUN
0	149.08 GB	auto

Easy-to-Use Management & Monitoring

Spent less time managing your storage and more time accessing your data. Storage environments can haphazardly build up with disparate storage groups making it necessary to tend to several management interfaces. With the FastStream Storage Controller, you can manage your complete storage infrastructure via a single product.

Key monitoring features include:

- Disk health utility
- Online performance monitoring
- SES (SCSI Enclosure Services) management and monitoring
- Temperature monitoring
- Command Line Interface

SES MONITOR

Enclosure 0

Vendor ID: AIC Product ID: EM12-53C-01A1
 Product Rev. Number: 114F Address: 50015b2160000079 0

Serial Number:

Power 1 OK	Power 2 OK	Temp 1 OK	Alarm OK	Fan 1 OK	Fan 2 OK	Fan 3 OK
Drive 1 Slot 1 OK	Drive 2 Slot 2 Not Installed	Drive 3 Slot 3 OK	Drive 4 Slot 4 Not Installed	Drive 5 Slot 5 Not Installed	Drive 6 Slot 6 OK	Drive 7 Slot 7 Not Installed
Drive 8 Slot 8 OK	Drive 9 Slot 9 OK	Drive 10 Slot 10 Not Installed	Drive 11 Slot 11 Not Installed	Drive 12 Slot 12 Not Installed		

HEALTH AND STATUS MONITOR

RAID Group Status RAID Group Name Status raid5set ONLINE raid1set ONLINE Hot Spares Available: 0 Number Spent Hot Spares: 0 <input type="button" value="Details >>"/>		Interface Status Ethernet Management Port 1: Link: Up Fibre Channel Port 1: Link: Down Speed: auto Mode: loop Fibre Channel Port 2: Link: Down Speed: auto Mode: loop Fibre Channel Port 3: Link: Down Speed: auto Mode: loop Fibre Channel Port 4: Link: Down	
Environmental Status Temperature: 30 C (0 C - 70 C)			
Enclosure Status Index ID / Address Status 0 50015b2160000079 0 OK <input type="button" value="Details >>"/>			

Immediate Notification

Keep track of your storage remotely and receive email warnings or critical problem notifications for 24-hour storage monitoring:

- Phone-home email alerts
- Battery-backed event log for troubleshooting

FastStream allows you to streamline your storage management and provides the tools you need to confidently and efficiently manage your storage infrastructure.

Power Center Software

Acceleration Software for Windows® and Mac®

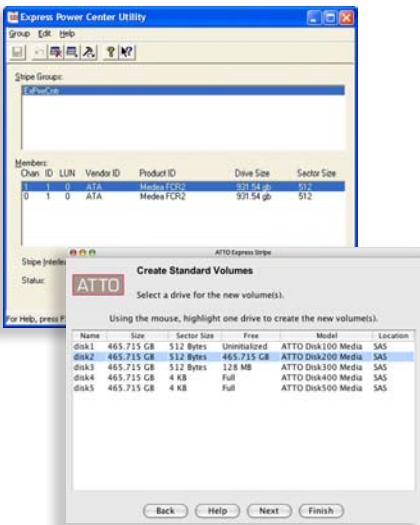
Intense computer applications such as digital video/audio creation and editing require the fastest speeds. ATTO's affordably priced acceleration software used with ATTO host adapters provides the highest performance from your attached SCSI, SAS, SATA and Fibre Channel storage. And, the easy-to-use wizard-style interface guides you through the steps to configure and optimize storage.



Power Center Software

RAID Software Features:

- Powerful acceleration software that works tightly with the OS to accelerate storage transfer and reduce latency
- Software RAID level 0 support for all ATTO host adapters
- Easy-to-use GUI interface
- User selectable interleave sizes
- Supports media with up to a 4KB sector size



For Windows®

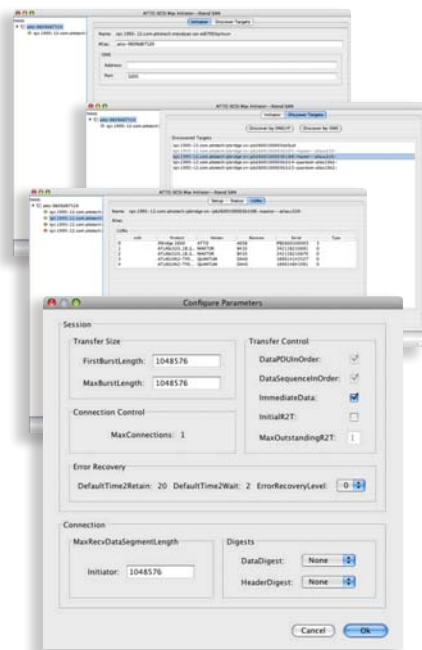
- Exclusive Smooth Data Optimization (SDO™) for increased productivity
- Seamless portability of stripe groups between systems
- Support for Windows 7, Vista, XP, Server 2008, 2003, 2000
- Part Number: EPCI-PWRC-000

For Mac®

- Benchmark the drive's peak, average and minimum read transfer rates
- Initialize disks and delete volumes
- Journaling support
- Create multiple volumes of various sizes simultaneously with support of up to 8 Exabytes
- Support for Mac OS X with OS 9 compatibility
- Part Number: EPCI-ESTR-000

Xtend SAN Software

iSCSI Initiator Application for Mac® OS X



Xtend SAN for Mac® OS X

- Uses standard Ethernet infrastructure to create a complete IP SAN
- Header/Data digest support
- Easy-to-use GUI simplifies set-up, configuration and management
- High-performance for demanding applications
- Support for up to 1024 targets
- Header and data digest support with class 1 error recovery
- iSCSI error handling and recovery
- SNS client support Login redirect function
- CHAP iSCSI security support
- iSNS client support
- Advanced CLI for addressing iSCSI targets
- Compatible with Mac® OS X
- Part Number: INIT-MAC0-XXX

With Xtend SAN iSCSI Initiator for Mac® software, you can make Direct Attached Storage available to multiple servers across long distances using the Ethernet technology built into your workstation. This enables you to take advantage of networked storage while avoiding the cost and complexity of a Fibre Channel SAN. With iSCSI, small businesses and workgroups can take full advantage of a SAN environment, even with limited IT budgets and resources.

Xtend SAN further lessens the effort associated with the implementation of an iSCSI SAN by providing ease-of-use setup and management features designed to parallel the elegance and simplicity Mac OS X users have come to expect.



Xtend SAN

Host Adapters

RAID Adapters

Switches

ATTO Solutions

Bridges

RAID Controllers

Software

Cables / Accessories

Cables & Accessories

You're working in a high-performance environment with state-of-the-art computer components — you need to trust that your cables are reliable. ATTO's engineering team rigorously tests and qualifies our cables to ensure the best quality available. Other lesser quality cables, terminators or other accessories can cause data integrity and performance problems. ATTO cables and accessories are premium-quality, professional-grade products.



SAS Cable, External SFF-8088 to SFF-8470

Cable Selection Chart		
Cable Type	Length	For Use with ATTO Products...
SCSI Cable, External HD68 to HD68 Part Number: CBL-HD68-R01	1 Meter	ExpressPCI SCSI Host Adapters
SCSI Cable, External VHDCI to HD68 Part Number: CBL-V68E-R3X	1 Meter	ExpressPCI SCSI Host Adapters, iPBridges, FibreBridges
SCSI Cable, External VHDCI to VHDCI Part Number: CBL-VHDC-R03	3 Meter	ExpressPCI SCSI Host Adapters, iPBridges, FibreBridges
Serial Cable, External DB9 to RJ11 Part Number: CBL-0911-R01	3 Meter	FastStream SC, iPBridges
Fibre Channel Cable, SC to SC Part Number: CBL-FCFI-R5X	5 Meter	FibreBridges
Fibre Channel Cable, LC to LC Part Number: CBL-LCLC-R03	3 Meter	Celerity Host Adapters, iPBridges, FibreBridges, FastStream SC
Fibre Channel Cable, LC to LC Part Number: CBL-LCLC-R10	10 Meter	Celerity Host Adapters, iPBridges, FibreBridges, FastStream SC
SAS Cable, Internal SFF-8087 to SFF-8087 Part Number: CBL-8087-INT	.5 Meter	ExpressSAS Host and RAID Adapters
SAS Cable, Internal SFF-8087 to SFF-8484 Part Number: CBL-8484-INT	.5 Meter	ExpressSAS Host and RAID Adapters, FastStream SC
SAS Cable, Internal SFF-8087 to (4) x1 SATA Part Number: CBL-SATA-INT	.5 Meter	ExpressSAS Host and RAID Adapters
SAS Cable, External SFF-8088 to SFF-8088 Part Number: CBL-8088-EX3	3 Meter	ExpressSAS Host and RAID Adapters
SAS Cable, External SFF-8088 to SFF-8470 Part Number: CBL-8470-EX3	3 Meter	ExpressSAS Host and RAID Adapters
Accessory Type		For Use with ATTO Products...
SCSI Terminator, LVD TERM-V68E-R02	-	ExpressPCI SCSI Host Adapters
SFP LC SW Optical SFP4-0000-R00	-	Celerity Host Adapters
SFP+ LC SW Optical SFP8-0000-R00	-	Celerity Host Adapters

How to Purchase ATTO Products

Purchase ATTO Products	
Direct Purchase	www.attostore.com
OEM Customers	Contact ATTO Sales: 716.691.1999 x241
System Integrators Value-Added Resellers	Worldwide distribution partners www.attotech.com/howtobuy
For product specifications, solutions and technology information	www.attotech.com



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