



A59612-SW Low Power/DataBolt 2 x 12-Port (96-Lanes) 12Gb/s SAS Switch



The Astek A59612-SW-02-SW-01 is a 1U high, 2 x 12-port (96-lanes) 12Gb/s SAS switch configured with 24 x 4 wide-port each capable of 48Gb/s with the management and SAS connectors on the front panel. The switch extends the capabilities of SAS in direct-attached storage (DAS) environments by allowing multiple servers to connect to one or more independent storage systems. Astek's A59612-SW-01 switch is designed to provide customers with an inexpensive and easy to use storage networking option for rack-mount server and storage installations in cloud computing, mega data-center and small- to medium-sized business (SMB) environments. The switch also supports DataBolt or End Device Frame Buffering (EDFB) which allows bandwidth optimization to support existing 6Gb/s SAS and SATA media.

The A59612-SW-01 has two independent 12 port (48 lanes) SAS switches that can be used separately or cascaded to form up to a 22 port switch. A typical cascaded configuration would be a 20 port (80 lanes) with a x8 inter-switch connection.

By enabling storage resources to be shared across multiple hosts, and managed effectively through SAS zoning, Astek SAS Switch products help customers to maximize storage resource utilization, eliminate islands of storage and simplify storage management, backup and upgrades. For longer distance connections up to 100 meters the A59612-SW-01 supports cable management and optical cables. The A59612-SW-01 is designed for High Availability (HA) applications with features such as Dual Redundant Externally Hot-Swappable Fans and Power Supplies.

Simple, plug-and-play integration is further enhanced by having complete SAS management available through a storage management utility. The utility is able to modify port configuration, including zoning, firmware management and viewing the topology of the SAS domain. It also offers flexibility to reconfigure without reconnecting cables or adding hardware. As the SAS physical layer supports both SAS and Serial ATA (SATA), the SAS Switch enables single switching infrastructure to address multiple classes of storage supporting a mix of SAS and SATA storage enclosures. The A59612-SW-01 can be used in a normal configuration as two independent switches, cascaded switches or configured for High Availability (HA) application where both ports of the storage are connected using redundant paths. If one of the switches fails, the second one will continue normal operation.

KEY APPLICATIONS

- Bandwidth optimization with DataBolt™ (EDFB)
- Rack mount server and storage clusters
- Cloud and Mega Data Center Environments
- High-Availability Applications
- SMB and Departmental

FEATURES

- Two independent 12-port switches
- Cascade able to form a 20-port switch
- Provides exceptional price/performance value, combining flexibility, simplicity, and enterprise-class functionality
- Simple, easy integration
- Industry-standard SAS infrastructure
- Enables direct-attached-storage to be scaled as a low-cost storage network
- 24 SAS connectors (4 SAS phys per port for 96 12Gb/s lanes)
- External Debug and Smart serial ports
- All the connectors are on the front panel
- 48Gb/s SAS ports, aggregate bandwidth of 1,152 Gb/s
- Supports cable management and optical cables
- Dual Hot-Swap Supplies
- Triple Hot-Swap Fans
- 1U high form factors
- SAS and SATA connectivity >1,000 devices per switch
- Standard zoning compliant
- Out-of-band management utility
- OS independent

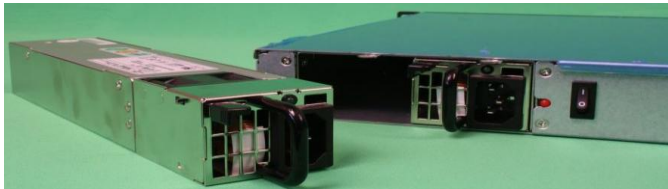

Ordering Information

A59612-SW-01	96 Lanes SAS 12Gb/s switch with hot-swap fans and dual redundant power supplies
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**A59612-SW Low Power/DataBolt
2 x 12-Port (96-Lanes) 12Gb/s SAS Switch**

Technical Specifications

SAS Compliances	SAS 3.0		
SAS Protocols	SSP,STP and SMP		
SAS Ports Configuration	96 12Gb/s lanes configured as 24 x4 Phy Wide ports		
SAS Bandwidths	Half Duplex Wide Port(4Phys)-48GB/s	Full Duplex Wide Port (4 phys) - 96Gb/s	
Storage Types	3.0, 6.0 and 12Gb/s SAS and / or SATA		
Cable Management	Passive Copper Cables up to 6 meters Active Optical Cables up to 100 meters		
Zoning	T10 Zoning		
Zone Groups & Zone Sets	Up to 192 zone groups, Up to 16 zone sets		
Management Interface	10/100 Ethernet out-of-band		
Firmware	Field Upgradeable		
Connectors	SAS 24 SFF8644 (Mini-SAS)	Ethernet 2 RJ-45 (front)	Serial 2 CLI Ports (rear)
LED Indicators	Red power failure on front and back		
Ethernet IP Address	Switch A (left) DHCP or Static IP Default Static IP 192.168.0.100	Switch B (right) DHCP or Static IP Default Static IP 192.168.0.101	
Power Consumption	80 watts nominal (no active cables); 100 watts max		
Power Supply	Dual Redundant (HA) Hot-Swap 220W 1U Supplies - 100-240 VAC @ 50/60Hz 		
Fans	Three (HA) Hot-Swap fans 		
Size	1.75" x 19" x 18.0"		
Environments	Operating 15° to 45° C 5 to 90% non-condensing Airflow: 200 LFM	Storage -10° to +85° C 5 to 90% non-condensing	

Preliminary



SAS Domain Manager Software

The screenshot shows the SAS Domain Manager GUI with the 'Domain' tab selected. The main window displays domain-specific information:

Domain Specific Information	
Overlay Name	Domain
Domain Id	1
Domain Access Point	SAS616x (500062b10002f87f)
Root Expander	500062b10002f87f
Number of Expander	2
Number of End Devices	17
Active Zone Set	None
Devices Requiring Attention	500062b10002f87f 50012be0000375bf

Below this is the 'SDM Specific Information' section:

SDM Specific Information	
GUI Version	5.0.7.0
Server Version	5.0.7.0
Server Host Name	192.168.1.100
Login Mode	Administrator

An environmental information window for the switch 500062b10002f87f is open, showing the following details:

500062b10002f87f	
Overall Status	OK
Temperature Sensors	OK
TempSense01	OK, 59°C (138.2°F)
TempSense02	OK, 62°C (143.6°F)
Cooling Elements	OK
CAT_A_FAN2_J83	OK, 4560 rpm
CAT_B_FAN1_J80	OK, 4560 rpm
Enclosures	OK
EnclosureElement01	OK
Connectors	OK

SAS Domain Manager Summary Tab and Switch Environmental Information.

The screenshot shows the 'Properties' tab for a device. The left pane shows a tree view of the domain structure:

- Domain (legend)
 - 500062b10002f87f
 - 5000650b003877fa0
 - 50012be0000375bf (selected)
 - 5000c50017909276
 - 5000c50031c34ff2
 - 5000c50031c394b2
 - 5000c50031c340ca
 - 5000c50031c395ea
 - 5000c500178f3e1e
 - 5000c500178f3d96
 - 5000c50031c17dda
 - 5000c50031c1bf16
 - 5000c500178f45a6
 - 5000c50031c367ba
 - 5000c500178d3a16
 - 5000c50031c1abfa
 - 5000c500178f47a2
 - 5000c50031c36bea
 - 5000c50031c36d62

The right pane shows the properties for the selected device:

Properties		Environmental		Attached Devices		Phys		Operations	
SAS Address	50012be0000375bf	Company Name	Astek Corporation						
IEEE ID	00 12 be	Device Type	Edge Expander						
Number of Physical PHYs	36	Number of Virtual PHYs	2						
Zoning Expander	Yes	Zoning Enabled	No						
Vendor Id	AstekCor	Product Id	Snowcat-Brann						
Product Revision Level	0100	Firmware Version	3.1.0.0						
Component Vendor Id	LSI	Component Id	547						
Component Revision Id	4	Table-to-Table Supported	Yes						
Device Phys	32-33-34-35	Parent SAS Address	500062b10002f87f						
Parent Phys	36-37-38-39	Vendor Specific (hex)	00 00 00 00 00 00 00						
Vendor Specific (ASCII)	□□□□□□□□								

SAS Phy Device Information



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SAS is a connection-oriented, point-to-point technology. When a host (initiator) issues a request to read or write data, the switch automatically determines how to route the connection request from the initiator to the correct data storage device (target). By default, any SAS initiator or target connected to the Astek A59612-SW-02 switch can access any other connected initiator or target in the SAS domain, without restrictions. However, because the SAS domain grows to include multiple hosts and multiple storage volumes, you can segregate one host from another host, or restrict one host from accessing storage owned by another host. SAS zoning partitions the SAS topology to isolate selected hosts from each other or to permit selected hosts to access only selected storage volumes. The Astek A59612-SW-02 switch supports the full SAS 2.0 T10 zoning model.

Zoning provides several benefits:

- **Security** – Zoning prevents users from accessing information that is not available to them.
- **Manageability** – Zoning reflects operational categories, such as marketing or engineering. Zoning also can partition hosts that run different operating systems to minimize conflicts.
- **Performance** – Zoning enables faster boot time because the host must discover only the storage within its zone or zones.

SAS Phy Configuration Table.

Enabled	Reset	Phy Id	Port Id	Link Speed/ Status	Attached Device	Attached Phy Id	Attached Device Type
<input checked="" type="checkbox"/>	<input type="checkbox"/>	0		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4	0	6.0 Gb/s	5000c50017909276	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5	1	6.0 Gb/s	5000c50031c34ff2	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6	2	6.0 Gb/s	5000c50031c394b2	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7	3	6.0 Gb/s	5000c50031c340ca	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8	4	6.0 Gb/s	5000c50031c395ea	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9	5	6.0 Gb/s	5000c500178f3e1e	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10	6	6.0 Gb/s	5000c500178f3d96	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11	7	6.0 Gb/s	5000c50031c17dda	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12	8	6.0 Gb/s	5000c50031c1bf16	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13	9	6.0 Gb/s	5000c500178f45a6	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14	10	6.0 Gb/s	5000c50031c367ba	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15	11	6.0 Gb/s	5000c500178d3a16	01	SAS Target
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19		Unknown			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20		Unknown			

About Astek Corporation

Astek manufactures storage products for embedded markets including medical, telecommunications and military applications. In addition to Host Bus Adapters, Astek also supplies Serial Attached SCSI solutions including edge and fan-out expanders.

For more information please visit the Astek web site at: www.astekcorp.com

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