



# 16Gb/s Fibre Channel Switches

## FibreConnect™ 1600 series

Scalable SAN connectivity provides enterprise-level features keeping with demanding data growth for small to mid-range SANs

### Superior Workflow Performance

FibreConnect™ switches provide high-performance connectivity with all ports operating at 2, 4, 8 or 16Gb/s enabling up to 768Gb/s (full duplex) of uncongested throughput. ATTO's exclusive latency management features ensure smooth and reliable data transfer for Storage Area Networks (SANs), a critical requirement for high-bandwidth applications such as streaming media, digital content creation, scientific research, medical imaging and non-linear editing. FibreConnect switches allow users to share media resources in a collaborative workflow, increasing overall project performance and productivity.

### Increased Efficiency

FibreConnect switches combine auto-sensing 2, 4, 8 and 16Gb/s throughput with features that significantly increase performance, functionality and workflow efficiency for SANs. A dual power supply option enables continuous SAN access ensuring uninterrupted workflow. This entry-level SAN switch enables organizations to consolidate and simplify resources, resulting in improved storage utilization and faster LAN-free backup.

### Advanced Scalability

The FibreConnect family of switches integrate innovative hardware and software features making it easy to manage and deploy a wide range of large block data streaming and high IOPs environments. With powerful and flexible Ports-On-Demand scalability from 12 or 24 ports in 12-port increments, FibreConnect allows organizations to grow their SAN in a non-disruptive manner.

### Simplified Management

FibreConnect switches combined with the Web Tool interface makes for easy deployment and management of a SAN. Diagnostic ports enable administrators to quickly identify optic and cable issues minimizing downtime. They provide self-configuring ports that match device speeds, allow for non-disruptive firmware updates and offer Forward Error Correction (FEC) to enhance transmission reliability and performance.

### Technical Highlights

- Delivers full 16Gb/s high-performance for up to 24 ports in a 1U form factor
- Ports-On-Demand ("pay-as-you-grow") scalability from 12 to 24 ports
- Simplifies deployment and troubleshooting, with easy to use Web Tools and advanced diagnostic features.
- Reduce SAN downtime with non-disruptive software upgrades and optional redundant power supply.
- Energy efficient solution with low power consumption
- Dual functionality as a full-fabric SAN switch or as an NPIV-enabled gateway
- Protects existing investments with auto-sensing 2, 4, 8 and 16Gb/s capabilities
- Extensive ATTO and Brocade interoperability with leading video and IT infrastructure vendors
- Complete Fibre Channel SAN connectivity solution when combined with ATTO's Celerity 16Gb/s Fibre Channel HBAs
- Includes one SFP for each active port, ear mount kit and 1-year standard product warranty

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FibreConnect™ 1600 series

Tech Sheet

## Technical Specifications

### Applications

FibreConnect switches easily deploy and integrate into both new and existing SANs while delivering exceptional performance and functionality. They allow organizations to manage the ever-increasing digital footprint seen in such applications as streaming media, oil and gas exploration, scientific research, medical imaging, and complex databases. The FibreConnect family permits multiple users to share media resources simultaneously, creating a productive and efficient workflow.

### System Architecture

#### Fibre Channel Standards

- FC-PH, FC-PH-2, FC-PH-3, FC-GS-2, FC-FLA, FC-FG, FC-SW3

#### Certified Maximum

- Single FOS fabric: 56 domains, 19 hops

#### Fibre Channel Ports

- 24 ports in 12-port increments through Ports-on-Demand licenses at 12 and 24 universal (E, F, M, EX, D or N) ports

#### Performance

- Auto-sensing of 2, 4, 8 and 16Gb/s port speed

#### ISL Trunking

- Frame-based trunking with up to 128Gb/s per ISL trunk (8 ports x 16Gb/s (line rate)) - License required
- Exchange-based load balancing across ISLs with DPS included in Fabric OS - Standard

#### Aggregate Bandwidth

- 768Gb/s: 24 ports x 16Gb/s (line rate) x 2 (full duplex)

#### Maximum Fabric Latency

- 700ns for locally switched ports
- Forward Error Correction (FEC) adds 400ns between E-Ports (enabled by default)

#### Maximum Frame Size

- 2,112-byte payload

#### Frame Buffers

- 700 dynamically allocated, 484 maximum per port

#### Classes of Service

- Class 2, Class 3, Class F (Interswitch Frames)

#### Media Types

- Requires FibreConnect hot-pluggable SFP+, LC connector; Short-Wavelength Laser (SWL); distance depends on fiber-optic cable and port speed

#### Data Traffic Types

- Fabric switches supporting unicast

### Port Types

- D\_Port (Diagnostic Port), F\_Port, M\_Port (Mirror Port), E\_Port and EX\_Port; self-discovery based on switch type (U\_Port)
- Access Gateway mode: F-Port and N\_Port

### Fabric Services

- Simple Name Server (SNS); Server Application Optimization (SAO); NTPv3; Reliable Commit Service (RCS); Dynamic Path Selection (DPS); Dynamic Fabric Provisioning (DFP); NPIV; ISL Trunking; FDMI; Management Server; FSPF; IPoFC, Frame Redirection; Port Fencing; BB credit recovery

### Connectivity Management

#### Interface

- Telnet, HTTP, SNMPv1/v3 (FE MIB, FC Management MIB); Auditing, Syslog, SSH, Change Management tracking; Web Tools; SMI-S compliant, SMI-S scripting toolkit

#### Management Access

- 10/100 Ethernet (RJ-45), in-band over Fibre Channel; serial port (RJ-45)

#### Security

- SSL, SSH v2, SFTP, HTTPS, LDAP with IPv6, RADIUS, Role-Based Access Control (RBAC), DHCPAP (between switches and end devices), FCAP switch authentication; FIPS 140-2 LC-compliant, Port Binding, Switch Binding, Secure RPC, Secure Copy (SCP), Trusted Switch, IPsec, IP Filtering

#### Diagnostics

- D-Port offline diagnostics, including electrical/optical loopback, link traffic/latency/distance; including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart, port mirroring, optics health monitoring, power monitoring, RAstrace logging, and Rolling Reboot Detection (RRD)

### Physical Specifications

#### Enclosure

- Back-to-front airflow (port-side exhaust); 1U; power from back
- Includes fixed rack mount rail kit
- Optional dual power supply

#### Dimensions

- Width: 437.64 mm (17.23 in), Height: 43.18 mm (1.7 in), Depth: 443.23 mm (17.45 in)
- System Weight: 7.82 kg (17.25 lb), with single power supply without SFP+; 9.16kg (20.19 lb), with dual power supply without SFP+

### Environmental Specifications

#### Temperature

- Operating: 0°-40°C (32°-104°F)
- Non-operating: -25°-70°C (-13°-158°F)

#### Relative Humidity

- Operating: 10% to 85% non-condensing
- Non-operational and storage (non-condensing): 10% to 95% non-condensing

#### Altitude (meters/feet)

- Operating: Up to 3,000 meters (9,842 feet)
- Storage: Up to 12 kilometers (39,370 feet)

#### Shock

- Operating: 20 G, 6 ms, half-sine
- Non-operating: Half-sine, 33 G, 11 ms, 3/eg Axis

#### Vibration

- Operating: 0.5 G sine, 0.4 grms random, 5 to 500 Hz
- Non-operating: 2.0 G sine, 1.1 grms random, 5 to 500 Hz

#### Heat Dissipation

- Maximum 24 ports: 338 BTU/hr

#### Input Voltage

- 85 to 264 V ~5 A to 2.5 A

#### Frequency

- 47 to 63 Hz

#### Power Consumption

- 80 watts with 24 ports at 16 Gbps SWL optics
- 60 watts for empty chassis, no optics

### Warranty

- Ships with 1 year return to factory support
- Optional 1 or 2 year extended support

ATTO FibreConnect 1600 Series		
Ports	12	24
Max. Transfer Rate Per Port	16Gb/s	16Gb/s
Aggregate Bandwidth (full duplex)	384Gb/s	768Gb/s
Part Number (Single Power)	FCSW-1612-D00	FCSW-1612-D00 FCSW-U012-000
Part Number (Dual Power)	FCSW-1612-D02	FCSW-1612-D02 FCSW-U012-000



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