

## 9000 Series Gigabit Edge Switches

The Allied Telesis 9000 Series of high performance Gigabit Ethernet switches brings advanced enterprise features to a more affordable level, improving the delivery of converged data for enterprise and embedded applications.



The AT-9000/28 28-port Gigabit managed switch features 24 fixed configuration 10/100/1000T ports and an additional 4 × 10/100/1000T-100/1000FX Gigabit-SFP combo ports.

The AT-9000/12POE is a 12-port Gigabit managed switch with 8 fixed configuration 10/100/1000T PoE+ ports, and an additional 4 × 100/1000FX SFP ports. This switch provides centralized power to support surveillance cameras and POS in small environments.

The AT-9000/28POE is a 28-port Gigabit managed switch with 24 fixed configuration 10/100/1000T PoE+ ports, and 4 × 10/100/1000T-100/1000SFP combo ports. It features two power supplies and supports Power over Ethernet Plus (PoE+), delivering up to 30W of centralized power for video surveillance and security applications to support today's business needs.

The AT-9000/28SP is a 28-port Gigabit managed switch with 24 × 100/1000 SFP ports and an additional 4 × 10/100/100T-100/1000FX Gigabit-SFP combo ports.

The AT-9000/52 52-port Gigabit managed switch offers 48 fixed configuration 10/100/1000T ports and 4 × SFP slots.

### Management Stacking

Enhanced Stacking provides CLI-based management of up to 24 switches with the same effort as for one switch. The Allied Telesis solution uses open standard Ethernet interfaces as stacking links so that many switches can be remotely managed as one IP entity across different sites.

## Key Features

### Easy, Industry Standard Management

- ▶ Industry standard CLI
- ▶ Simple, intuitive, full featured Allied Telesis Web Interface
- ▶ Secure, encrypted Web and CLI management with SSHv2 and SSL
- ▶ SNMP v1, v2C, V3

### Ideal for Classroom or Retail Environments

- ▶ 12, 28 or 52 active ports
- ▶ Lower power consumption switches
- ▶ Near silent operation

### Management Stacking

- ▶ Enhanced Stacking up to 24 units
- ▶ Single IP address stack management

### All the QoS Needed for an Open Office, Classroom or Retail Store Environment

- ▶ Eight priority queues
- ▶ IEEE 802.1p for Layer 2 QoS
- ▶ DSCP (DiffServ) for Layer 3 QoS
- ▶ IEEE 802.1p to DSCP remarking traffic ready for transport to the Layer 3 core of the network
- ▶ Layer 2 and Layer 4 Access Control List (ACL)

### Secure Management

Only authorized administrators can access the management interface of the 9000 Series. Security protocols such as SSL, SSH and SNMPv3 facilitate this protection of your network for both local or remote connections.

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### Securing the Network at its Most Vulnerable Point

- ▶ IEEE 802.1x and RADIUS network login: for advanced control for user authentication and accountability
- ▶ Guest VLAN: to ensure visitors or unauthorized users connect only to services defined by IT such as Internet services
- ▶ Dynamic VLAN
- ▶ TACACS+: for ease of management security administration
- ▶ Fiber model provides even higher security for long distance connectivity

### Access Control Lists

- ▶ Access Control Lists enable inspection of incoming frames and classify them based on various criteria. Specific actions can then be applied to these frames in order to more effectively manage the network traffic at Layer 2 through Layer 4. Typically, ACLs are used as a security mechanism, either permitting or denying entry (hence the name Access Control) for frames in a group, but ACLs can also be applied to QoS.

### Centralized Power with PoE+

- ▶ The AT-9000/12POE and /28POE support PoE+ with up to 30W per port and a high PoE budget.
- ▶ PoE supports IP security cameras, VoIP phones, Wireless Access Points, POS, access control and help points (intercoms, automatic doors, entry cards, keyless entry), and lighting controllers.

such as SSL, SSH and SNMPv3 facilitate this protection of your network for both local or remote connections.

### Environmentally Friendly Eco-Switch

In keeping with our commitment to environmentally friendly processes and products, the 9000 Series is a green range of products designed to reduce power consumption, minimize hazardous waste and even reduce

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office noise pollution. Features include the use of high efficiency power supplies and low power chipsets. We have also included an Eco-Switch button on the front panel of all 9000 Series switches. This allows you to conserve additional power by turning off the port and mode LEDs when they are not required.

### Low Power Consumption with Near Silent Operation

Specifically designed to be usable in a classroom or retail store environment, the 9000 Series uses the latest in low power technologies to minimize power consumption and operational noise.

### Ideal Branch Office and Wiring Closet Connectivity

Powerful line rate performance makes this switch ideal for branch offices or the wiring closet of larger offices. The state-of-the-art QoS capability of this product ensures reliable delivery of advanced network services such as voice and video, while effectively controlling the continually increasing traffic needs found in today's networks.

### Easy Access Networking

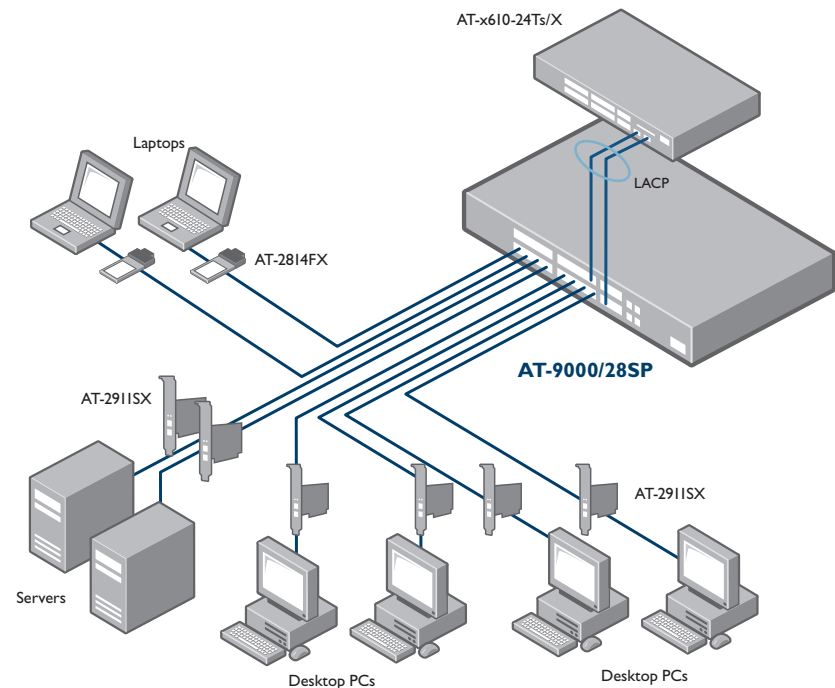
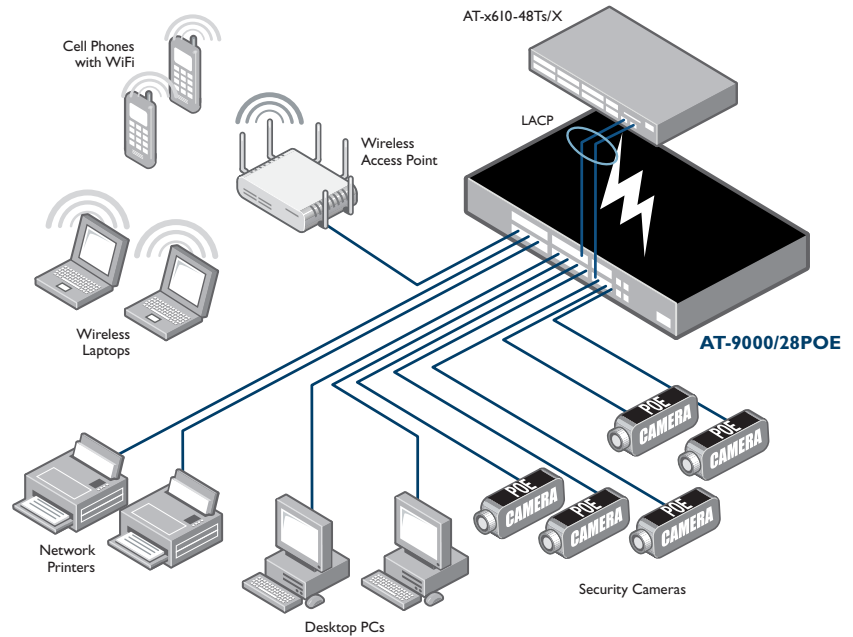
Featuring an industry standard CLI and the Allied Telesis intuitive Web interface, the advanced features of the 9000 Series are accessible to a wide range of system administrators. The well-known CLI and Web interfaces significantly reduce learning time and minimize the cost of deployment.

### Securing the Network Edge

To ensure the protection of your data, it is important to control access to your network. Protocols such as IEEE 802.1x port-based authentication guarantee that only known users are connected to the network. Unknown users who physically connect can be isolated to a pre-determined part of your network, offering guests such benefits as Internet access while ensuring the integrity of your private network data.

The switch is also fully compliant with Microsoft Network Access Protection (NAP) and Symantec Network Access Control (NAC).

## Key Solutions



### Gigabit and Fast Ethernet SFP Support

All switches in the 9000 Series support

both Gigabit and Fast Ethernet Small Form-factor Pluggables (SFPs). This makes the 9000 Series an ideal family for environments where Gigabit fiber switches will be phased in over time. The 9000 Series allows for connectivity to the legacy 100FX hardware until it is upgraded to Gigabit.

### VLAN Double Tagging (Q-in-Q)

VLAN double-tagging can be useful for customers such as Internet Service Providers (ISPs), allowing them to use VLANs internally while mixing traffic from clients that are already VLAN tagged. The first VLAN tag is used by the ISP to route traffic across its own network, while the second VLAN tag is that of the end-user customer. This feature allows end-users to have physically distributed networks, which they can manage themselves, carried over an independent infrastructure.

### sFlow

sFlow is an industry-standard technology for monitoring high-speed switched networks. It gives complete visibility into the use of networks enabling performance optimization, accounting and billing for usage, and defense against security threats. Sampled packets sent to a collector ensure sFlow always maintains a real-time view of network traffic.

## Specifications

### System Capacity

128MB RAM
16MB flash memory
8,192 MAC addresses
4094 VLANs
Packet buffer memory:
AT-9000/12POE 1MB
AT-9000/28 512KB
AT-9000/28POE 512KB
AT-9000/28SP 1MB
AT-9000/52 512KB

### Maximum Bandwidth

Non-blocking for all packet sizes	
Throughput:	
AT-9000/12POE 35.7Mpps	
AT-9000/28 41.6Mpps	
AT-9000/28POE 41.6Mpps	
AT-9000/28SP 41.6Mpps	
AT-9000/52 77.35Mpps	

Switching capacity:	
AT-9000/12POE 24Gbps	
AT-9000/28 56Gbps	
AT-9000/28POE 56Gbps	
AT-9000/28SP 56Gbps	
AT-9000/52 104Gbps	

Supports 9216 bytes jumbo packets

### Wirespeed Switching on all Ethernet Ports

14,880pps for 10Mbps Ethernet  
148,800pps for 100Mbps Ethernet  
1,488,000pps for 1000Mbps Ethernet

### Environmental Specifications

Operating temperature: 0°C to 40°C (32°F to 104°F)  
Storage temperature: -25°C to 70°C (-13°F to 158°F)  
Operating humidity: 5% to 90% non-condensing  
Storage humidity: 5% to 95% non-condensing  
Operating altitude range, up to 3,000 meters (9,843 feet)

### Port Configuration

Auto-negotiation, duplex, MDI/MDI-X, IEEE 802.3x flow control/back pressure  
Head of Line (HOL) blocking prevention  
Broadcast storm control  
Broadcast, multicast, unknown unicast rate limiting  
Port mirroring  
Ethernet statistics  
Redundant master/slave management

### Ethernet Specifications

RFC 894 Ethernet II encapsulation  
IEEE 802.1D MAC bridges  
IEEE 802.1Q Virtual LANs  
IEEE 802.2 logical link control  
IEEE 802.3ab 1000T  
IEEE 802.3ad (LACP) link aggregation  
IEEE 802.3u 100TX  
IEEE 802.3x full-duplex operation  
IEEE 802.3z Gigabit Ethernet

### Quality of Service (QoS)

IEEE 802.1p QoS  
Eight priority queues  
Strict priority and weighted round robin  
DSCP  
Rate limiting  
Voice VLAN

### Spanning-Tree Protocol

IEEE 802.1D Spanning-Tree Protocol  
IEEE 802.1w Rapid Spanning-Tree Protocol  
BPDU guard  
Loop guard

### Management

Web-based GUI  
Industry standard command line interface (CLI)  
Enhanced Stacking  
RFC 854 Telnet client  
Telnet server  
NTP  
RFC 2616 HTTP  
RFC 1350 TFTP download/upload  
Zmodem download/upload  
RFC 1157 SNMPv1/v2c  
RFC 2570 SNMPv3  
RFC 1215 SNMP traps  
RFC 1757 RMON 4 Groups: Stats, History, Alarms, Events  
Event log  
RFC 3176 sFlow

### MIB Support

Allied Telesis private MIB  
RFC 1155 MIB  
RFC 1213 MIB-II  
RFC 1493 Bridge MIB  
RFC 1643 Ethernet MIB  
RFC 2096 IP forwarding table MIB  
RFC 2790 Host MIB  
RFC 2863 The Interfaces Group MIB  
RFC 3176 sFlow MIB

### VLAN

Supports up to 4094 VLAN IDs  
Support for 255 active VLANs  
IEEE 802.1Q VLAN tag  
Port-based and MAC-based VLANs  
Port protected VLANs  
IEEE 802.1P GVRP  
Double VLAN tagging (Q-in-Q)

### Link Aggregation

Static trunking  
IEEE 802.3ad Link Aggregation Control Protocol (LACP)  
Support for 12 groups per device and trunk can support up to eight members per group

### Link Discovery

IEEE 802.1ab Link Layer Discovery Protocol (LLDP)  
Link Layer Discovery Protocol-Media Endpoint (LLDP-MED)

### General Protocols

RFC 768 UDP  
RFC 791 IP  
RFC 792 ICMP  
RFC 793 TCP  
RFC 826 ARP  
RFC 951 BootP  
RFC 1122 Internet host requirements

### IP Multicast

Layer 2 multicast forwarding and filtering up to 256 groups  
RFC 1112 IGMPv1 snooping  
RFC 2236 IGMPv2 snooping  
RFC 3376 IGMPv3 snooping

## 9000 Series | Gigabit Edge Switches

### Security / IEEE 802.1x

Layer 2/3 permit/deny/mirror ACLs  
 SSHv2  
 SSLv3  
 RFC 2865 Radius  
 RFC 1492 TACACS+  
 Port security (limited/dynamic)  
 IEEE 802.1x port base  
 IEEE 802.1x multiple host mode  
 IEEE 802.1x supplicant  
 IEEE 802.1x authenticator  
 IEEE 802.1x MD-5  
 IEEE 802.1x LEAP  
 IEEE 802.1x PEAP  
 IEEE 802.1x EAP-TLS  
 IEEE 802.1x TTLS  
 IEEE 802.1x dynamic VLANs  
 IEEE 802.1x guest VLANs  
 IEEE 802.1x secure VLANs  
 IEEE 802.1x multiple supplicant mode  
 IEEE 802.1x piggy-back mode  
 IEEE 802.1s MSTP  
 Per-port MAC address limiting  
 Per-port MAC address filtering  
 Per-port MAC address lockdown  
 Microsoft NAP compliant  
 Symantec NAC support

### IPv6

IPv6 host

### Compliance Standards

IEEE 802.3 – 10T  
 IEEE 802.3u – 100TX with auto-negotiation  
 IEEE 802.3ab – 1000T Gigabit Ethernet  
 100FX SFP support  
 1000X SFP support

### Safety and Electromagnetic Emissions Certifications

EMI: FCC class A, CISPR 22 class A, EN55022 class A, C-TICK, VCCI  
 Immunity: EN55024, EN61000-3-2 and EN61000-3-3  
 Safety: UL 60950 (cULus), EN60950-1 (TUV)  
 Quality and reliability: MTBF – 340,000 hours

### RoHS Standards

Compliant with European and China RoHS standards

### Package Description

AT-9000/xx switch  
 AC power cord  
 Management cable (RJ-45 to DB-9)  
 Rubber feet for desktop installation and 19" rack mountable hardware kit accessories

### Country of Origin

Singapore

### Physical Specifications

	Dimensions (W x D x H)
AT-9000/12POE	33 x 20.3 x 4.4 cm 13 x 8 x 1.73 in
AT-9000/28	44 x 25.6 x 4.4 cm 17.33 x 10.08 x 1.73 in
AT-9000/28POE	44 x 32.1 x 4.4 cm 17.33 x 12.66 x 1.73 in
AT-9000/28SP	44 x 25.6 x 4.4 cm 17.33 x 10.08 x 1.73 in
AT-9000/52	44 x 25.6 x 4.4 cm 17.33 x 10.08 x 1.73 in

### Product Weight

	Weight (kg/lbs)
AT-9000/12POE	2.40 kg / 5.3 lb
AT-9000/28	3.62 kg / 8 lb
AT-9000/28POE	4.05 kg / 8.92 lb
AT-9000/28SP	4.01 kg / 8.85 lb
AT-9000/52	4.06 kg / 8.95 lb

### Acoustic Noise

AT-9000/12POE	51.3dB
AT-9000/28	37.4dB
AT-9000/28POE	57.9dB
AT-9000/28SP	41.7dB
AT-9000/52	44.3dB

### Power Characteristics

Voltage: 100-240V AC, 1A  
 Frequency: 50/60Hz

### PoE Budget

AT-9000/12POE	123.2W
AT-9000/28POE	370W

### Maximum Power Supply Efficiency

AT-9000/12POE Standard product with single AC power supply	83%
AT-9000/28 Standard product with single AC power supply	83%
AT-9000/28POE Standard product with dual AC power supply	83%
AT-9000/28SP Standard product with single AC power supply	85%
AT-9000/52 Standard product with single AC power supply	83%

### Heat Dissipation (BTU/hr)

	No PoE Load	Max PoE Load
AT-9000/12POE Standard product with single AC power supply	80.6	125
AT-9000/28 Standard product with single AC power supply	132.94	—
AT-9000/28POE Standard product with dual AC power supply	132.94	224
AT-9000/28SP Standard product with single AC power supply	132.94	—
AT-9000/52 Standard product with single AC power supply	153.30	—

### Power Consumption

Typical in eco-friendly mode:

AT-9000/12POE Standard product with single AC power supply	23.62W
AT-9000/28 Standard product with single AC power supply	29.58W
AT-9000/28POE Standard product with dual AC power supply	32.4W
AT-9000/28SP Standard product with single AC power supply	35.65W
AT-9000/52 Standard product with single AC power supply	44.92W

Maximum power consumption:

AT-9000/12POE Standard product with single AC power supply	158.6W
AT-9000/28 Standard product with single AC power supply	30.74W
AT-9000/28POE Standard product with dual AC power supply	401.8W
AT-9000/28SP Standard product with single AC power supply	37.42W
AT-9000/52 Standard product with single AC power supply	46.13W

### Latency

(at 64 byte)

	10Mbit	100Mbit	1000Mbit
AT-9000/12POE	81.92µs	11.56µs	3.82µs
AT-9000/28	78.77µs	11.25µs	3.79µs
AT-9000/28POE	81.92µs	11.56µs	3.82µs
AT-9000/28SP	78.77µs	25.22µs	3.84µs
AT-9000/52	76.86µs	11.43µs	4.18µs

MODEL	PoE POWER AVAILABLE	MAXIMUM SUPPORTED PoE PORTS		
		IEEE 802.3AF CLASS 2	IEEE 802.3AF CLASS 3	IEEE 802.3AT CLASS 4
AT-9000/12POE	123.2W	8	8	4
AT-9000/28POE	370W	24	24	12



### Ordering Information

#### Gigabit Ethernet Switches

##### AT-9000/12POE-xx

8 × 10/100/1000T RJ-45 ports  
4 SFP ports (4 × 100/1000FX ports)  
Internal single AC power supply

##### AT-9000/28-xx

24 × 10/100/1000T RJ-45 ports  
4 Gigabit-SFP combo ports (4 × 10/100/1000T-100/1000FX ports)  
Internal single AC power supply

##### AT-9000/28POE-xx

24 × 10/100/1000T RJ-45 ports, PoE+  
4 Gigabit-SFP combo ports (4 × 10/100/1000T-100/1000FX ports)  
Internal dual AC power supply

##### AT-9000/28SP-xx

24 × 100/1000 SFP ports  
4 Gigabit-SFP combo ports (4 × 10/100/1000T-100/1000FX ports)  
Internal single AC power supplies

##### AT-9000/52-xx

48 × 10/100/1000T RJ-45 ports  
4 × 100/1000 SFP ports  
Internal single AC power supplies

Where xx =

- 10 for US power cord
- 20 for no power cord
- 30 for UK power cord
- 40 for Australian power cord
- 50 for European power cord

#### Small Form Pluggable Optics Modules

##### AT-SPSX

SFP, MMF, 1000Mbps, 220 / 500 m, 850 nm, LC

##### AT-SPEX

SFP, MMF, 1000Mbps, 2 km, 1310 nm, LC

##### AT-SPLX10

SFP, SMF, 1000Mbps, 10 km, 1310 nm, LC

##### AT-SPLX40

SFP, SMF, 1000Mbps, 40 km, 1310 nm, LC

##### AT-SPZX80

SFP, SMF, 1000Mbps, 80 km, 1550 nm, LC

##### AT-SPBD10-13

SFP, SMF, 1000Mbps, 10 km, 1310/1490 nm, LC-BiDi

##### AT-SPBD10-14

SFP, SMF, 1000Mbps, 10 km, 1490/1310 nm, LC-BiDi

##### AT-SPTX

SFP, 1000T, 100 m, RJ-45

##### AT-SPFX/2

SFP, MMF, 100Mbps, 2 km, 1310 nm, LC

##### AT-SPFXBD-LC-13

SFP, SMF, 100Mbps, 10 km, 1310/1510 nm, LC-BiDi

##### AT-SPFXBD-LC-15

SFP, SMF, 100Mbps, 10 km, 1510/1310 nm, LC-BiDi

##### AT-SPFX/15

SFP, SMF, 100Mbps, 15 km, 1310 nm, LC