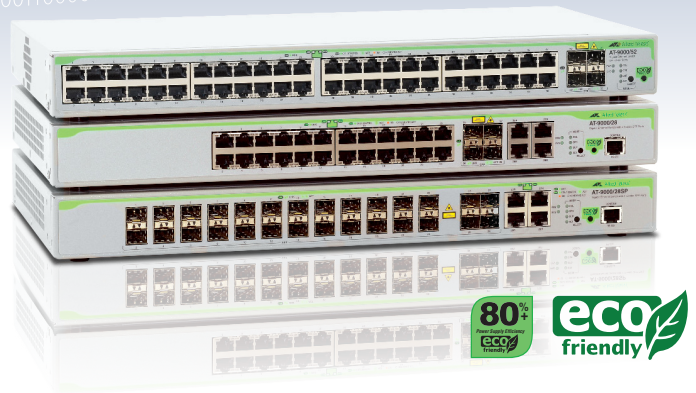


9000 Series

MANAGED LAYER 2-4 GIGABIT ETHERNET ECO-SWITCHES

The 9000 Series of high performance Layer 2-4 28- and 52-port Gigabit Ethernet switches brings advanced enterprise features to a more affordable level while supporting the changing needs of the SMB market space to improve the delivery of converged data. Support for jumbo Ethernet frames enables higher throughput of time-sensitive data.



The AT-9000/28 is a 28-port Gigabit managed switch with 24 fixed configuration 10/100/1000T ports, an additional 4 x 100/1000 SFP ports, combined with 4 x 10/100/1000T ports.

The AT-9000/28SP is a 28-port Gigabit managed switch with 24 x 100/1000 SFP ports, an additional 4 x 100/1000 SFP ports, combined with 4 x 10/100/1000T ports.

The AT-9000/52 is a 52-port Gigabit managed switch with four fixed configuration 10/100/1000 ports.

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.

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.

Key Features

Easy, Well Known Management

- » Industry standard AlliedWare Plus™ CLI
- » Simple, intuitive, full featured Allied Telesis Web Interface
- » Secure, encrypted Web and CLI management with SSHv2 and SSL
- » SNMP

Ideal for Classroom or Retail Environments

- » 28 or 52 active port
- » 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)

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

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.

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 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 AlliedWare Plus 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).

Gigabit and Fast Ethernet SFP Support

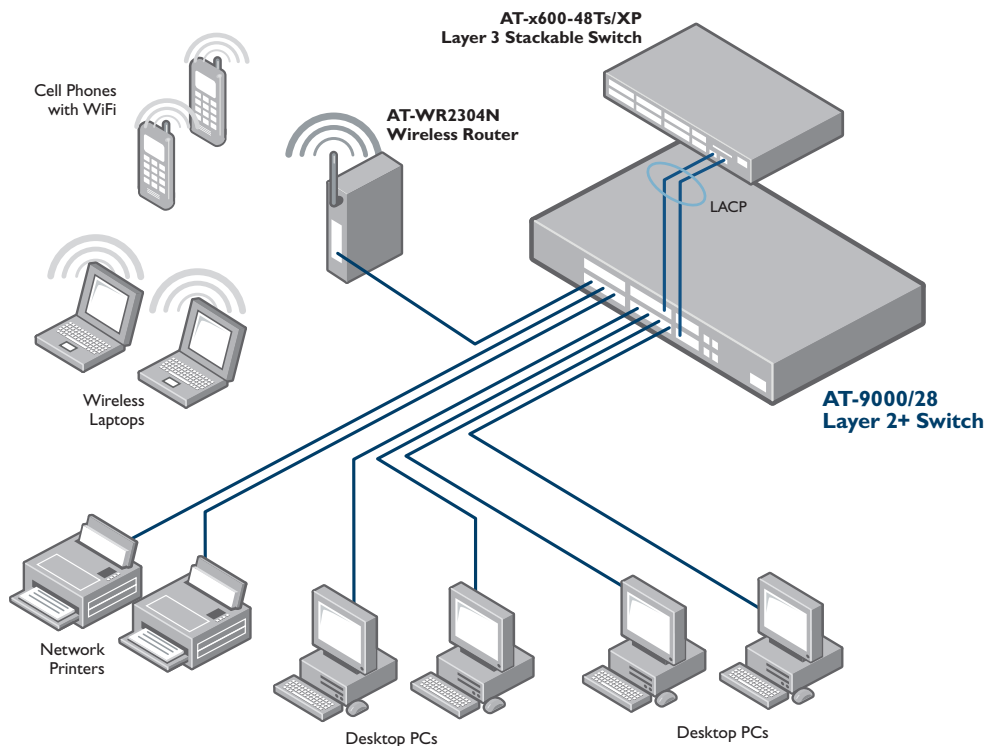
All switches in the 9000 Series support both Gigabit and Fast Ethernet Small Form-factor Pluggables (SFPs). This makes the 9000 Series an ideal family for environments where Gigabit fiber switches will be phased in over time. The 9000 Series allows for connectivity to the legacy 100FX hardware until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

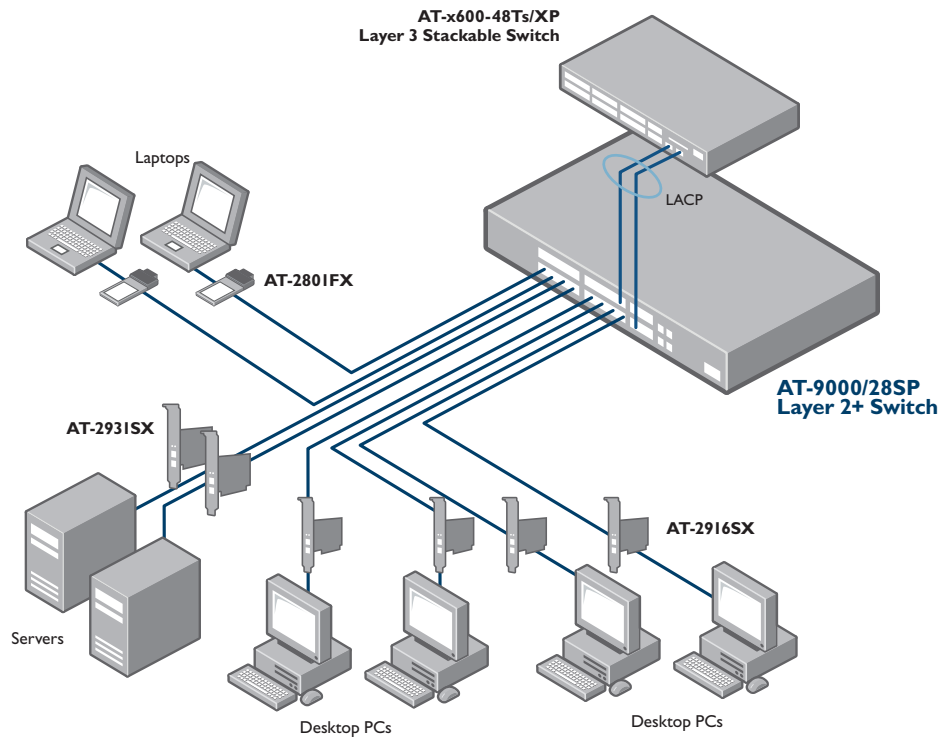
VLAN Double Tagging (Q-in-Q)

VLAN double-tagging can be useful for customers such as Internet Service Providers (ISP), 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 their own network, while the second VLAN tag is that of the end-user customer. The use of 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.





System Capacity

128MB RAM
 16MB flash memory
 8,192 MAC addresses
 4094 VLANs
 Packet buffer memory:

| | |
|--------------|-------|
| AT-9000/28 | 512KB |
| AT-9000/28SP | 1MB |
| AT-9000/52 | 512KB |

Maximum Bandwidth

Non-blocking for all packet sizes
 Throughput:

| | |
|--------------|-----------|
| AT-9000/28 | 41.6Mpps |
| AT-9000/28SP | 41.6Mpps |
| AT-9000/52 | 77.35Mpps |

Switching capacity:

| | |
|--------------|---------|
| AT-9000/28 | 56Gbps |
| AT-9000/28SP | 56Gbps |
| AT-9000/52 | 104Gbps |

Switch fabric speed:

| | |
|--------------|---------|
| AT-9000/28 | 62Gbps |
| AT-9000/28SP | 62Gbps |
| AT-9000/52 | 125Gbps |

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
 Bad cable detection
 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 AlliedWare Plus
 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

Security / IEEE 802.1x

Layer 2/3/4 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
Install guide and CLI users guide on CD

Physical Specifications

| | Dimensions (WxDxH) |
|--------------|---|
| AT-9000/28 | 44 x 25.6 x 4.4 cm 17.33 x 10.08 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-9000/28 | 3.62 kg / 8 lb |
| AT-9000/28SP | 4.01 kg / 8.85 lb |
| AT-9000/52 | 4.06 kg / 8.95 lb |

Acoustic Noise

| | |
|--------------|--------|
| AT-9000/28 | 37.4dB |
| AT-9000/28SP | 41.7dB |
| AT-9000/52 | 44.3dB |

Power Characteristics

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

Maximum power supply efficiency:

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

Heat dissipation (BTU/hr):

| | |
|--|--------|
| AT-9000/28 | 104.09 |
| Standard product with single AC power supply | |
| AT-9000/28SP | 127.76 |
| Standard product with single AC power supply | |
| AT-9000/52 | 153.30 |
| Standard product with single AC power supply | |

Power Consumption

Typical in eco-friendly mode:

| | |
|--|--------|
| AT-9000/28 | 29.58W |
| Standard product with single AC power supply | |
| AT-9000/28SP | 35.65W |
| Standard product with single AC power supply | |
| AT-9000/52 | 44.92W |
| Standard product with single AC power supply | |

Maximum power consumption:

| | |
|--|--------|
| AT-9000/28 | 30.74W |
| Standard product with single AC power supply | |
| AT-9000/28SP | 37.42W |
| Standard product with single AC power supply | |
| AT-9000/52 | 46.13W |
| Standard product with single AC power supply | |

Latency

| | 10Mbit | 100Mbit | 1000Mbit |
|--------------|---------|---------|----------|
| AT-9000/28 | 78.77µs | 11.25µs | 3.79µs |
| AT-9000/28SP | 78.77µs | 25.22µs | 3.84µs |
| AT-9000/52 | 76.86µs | 11.43µs | 4.18µs |



Ordering Information

Stackable Gigabit Ethernet Switches

AT-9000/28-xx

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

AT-9000/28SP-xx

24 x 100/1000 SFP ports
4 combo ports (4 x 10/100/1000T RJ-45 ports or
4 x 100/1000 SFP ports)
Internal single AC power supplies

AT-9000/52-xx

48 x 10/100/1000T RJ-45 ports
4 x 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
- 51 for European power cord with extended firmware

Country of Origin

Singapore

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, 10/100/1000T, 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