



AT-9900 SERIES

Multilayer IPv4 and IPv6 Gigabit Switches

AT-9924T

24 x 10/100/1000BASE-T copper ports and 4 x 1000BASE-X SFP combo ports

AT-9924T/4SP

24 x 10/100/1000BASE-T copper ports and 4 x 1000BASE-X SFP combo ports, high performance IPv6

AT-9924SP

24 x 1000BASE-X SFP ports

AT-9900 Industry Leading Features

The AT-9900 series delivers performance, flexibility, and reliability. Packaged in a 1RU standard rack mount chassis, all AT-9900 switches incorporate a switching core that yields wire-speed Layer 3 IPv4 routing, exceptional Quality of Service (QoS) features, and a robust hardware design with dual hot-swappable power supplies. The AT-9924T/4SP is capable of high-performance hardware-based Layer 3 IPv6 routing.

AT-9924 Policy-based Quality of Service

Comprehensive, low latency QoS features operating at wire-speed provide flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles. The AT-9924 QoS features are ideal for service providers wanting to ensure maximum availability of premium voice, video and data services, and at the same time manage customer service level agreements (SLAs). For enterprise customers, the AT-9924 QoS features protect productivity by guaranteeing performance of business-critical applications including VoIP services, and help restore and maintain responsiveness of enterprise applications in the networked workplace.

AT-9924 IPv6 Capability

The AT-9924T/4SP is one of the few switches on the market today that can provide high performance IPv6 unicast and multicast routing, and IPv6 QoS features. The AT-9924T/4SP delivers advanced IPv6 capabilities allowing IPv6 early-adopters to get a head start in the migration to next generation IPv6 networks.

AT-9924 Management Stacking

Stacking provides CLI-based management of up to 9 switches with the same effort as for one switch. The Allied Telesyn solution uses open standards interfaces as stacking links so that many switches can be stacked across different sites, which is not possible using the proprietary stacking cable solutions. Also, the use of open standards interfaces avoids the use of expensive specialized hardware with limited topologies.

AT-9924 Reliability

Dual internal hot-swappable load-sharing power supplies provide ultimate space-saving reliability and redundancy for maximum service uptime. Both 110/240V AC and 48V DC PSU versions are available. There is no requirement for an external RPS, and combined with front-to-back cooling and a 1RU height, the AT-9924 is perfect for the high-density rack environment where conditions are demanding and space is at a premium.

AT-9924 Power to Perform

The AT-9924 top-of-the-line multilayer switch is part of a series built to meet the needs of high performance network services. Together with Allied Telesyn's advanced software feature set, AlliedWare, the AT-9924 is a superior high-density gigabit switching solution, bringing true intelligence to the network.

Key Features

- 1RU form factor
- Non-blocking Layer 2 and 3 IPv4 switching and routing at wire-speed
- Hardware-based Layer 3 IPv6 routing¹
- Provides up to 256K Layer 3 IPv4 address table entries²
- Supports full 4096 VLANs
- Supports 4096 Layer 3 interfaces
- Supports VLAN double tagging
- Private VLANs, providing security and port isolation of multiple customers using the same VLAN
- 802.1x support for network security
- Supports 9KByte Jumbo frame size³
- Gigabit SFP ports will support any combination of 10/100/1000BASE-T, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX or 1000BASE-ZX CWDM SFPs
- Full environmental monitoring, with alerts to network manager in case of failure
- Extensive wire-speed traffic classification
- Comprehensive wirespeed QoS features
- Low switching latency, ideal for voice and multi-media applications
- Advanced routing protocols OSPF, BGP-4, RIP and RIPv2, DVMRP, PIM-SM, PIM-DM
- STP, RSTP, MSTP (802.1s)
- Port trunking (802.3ad LACP)
- Port mirroring
- Asynchronous management port
- SSH for secure management
- SNMPv3
- GUI

¹ On the AT-9924T/4SP when fitted with the AT-ACCO1 IPv6 accelerator card.

² For 256K Layer 3 IPv4 address table entries, either the 256 MB SDRAM or 512MB SDRAM (9924T/4SP only) must be fitted.

³ When Jumbo frame support is enabled, the MRU is 9714 bytes for ports operating at 10/100Mbps, and 10,240 bytes (10KBytes) at 1Gbps, however maximum supported frame size is 9KB.

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Performance

AT-9924T and AT-9924SP

- Switching Capacity 48Gbps
- Forwarding Rate 36Mpps⁴

AT-9924T/4SP

- Switching Capacity 68Gbps
- Forwarding Rate 36Mpps⁴

Up to 256K IPv4 routes
Up to 12K MAC addresses typical
4K VLANs
Up to 512MB CPU SDRAM (9924T/4SP)
Packet buffer memory:
- 9924T and 9924SP - 64MB
- 9924T/4SP - 160MB
16MB Flash Memory

Reliability

MTBF
AT-9924T and AT-9924SP
1 PSU: 130,000 hours⁵
2 PSUs: 240,000 hours⁵

AT-9924T/4SP
1 PSU: 100,000 hours⁶
2 PSUs: 200,000 hours⁶

Acoustic Noise

51.0 dB

Power Characteristics

AC:
Voltage: 100-240V AC (10% auto ranging)
Frequency: 47-63Hz

DC:
Voltage: 40-60V DC

Power Consumption

AT-9924T:
75Watts (256 BTU/hour) maximum
AT-9924SP:
75Watts (256 BTU/hour) maximum
AT-9924T/4SP-A:
90 Watts (307 BTU/hour) maximum
AT-9924T/4SP-P:
125 Watts (427 BTU/hour) maximum

Environmental Specifications

Operating Temp:
0°C to 50°C (32°F to 122°F)⁷
Storage Temp:
-25°C to 70°C (-13°F to 158°F)
Operating Humidity:
5% to 80% non-condensing
Storage Humidity:
5% to 95% non-condensing
Operating Altitude: 10,000ft

Physical Dimensions

Height: 44.5mm (1.75")⁸
Width: 440mm (16.7")
Depth: 440mm (16.7")⁹
Mounting: 19" rack mountable, 1 RU form-factor

Weight

AT-9924T: 6.8kg (15.0 lbs) or 7.7kg (17.0 lbs) packaged¹⁰
AT-9924SP: 6.8kg (15.0 lbs) or 7.7kg (17.0 lbs) packaged¹⁰
AT-9924T/4SP-A: 7.4kg (16.3 lbs) or 8.9kg (19.6 lbs) packaged¹¹
AT-9924T/4SP-P: 7.8kg (17.2 lbs) or 9.3kg (20.5 lbs) packaged¹¹
AT-PWR01 (AC or DC): 1.0 kg (2.2 lbs) or 1.8 kg (4.0 lbs) packaged
AT-FAN01: 0.6 kg (1.3 lbs) or 1.4 kg (3.1 lbs) packaged

Electrical Approvals and Compliances

EMC
EN55022 class A, FCC class A, VCCI class A, AS/NZS CISPR22 class A
Immunity: EN55024, EN61000-3-2/3, CNS 13438 Class A.

Safety

UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950-1, EN60825-1, AS/NZS 60950
Certification: UL, cUL, TUV

Country of Origin

Singapore

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- ⁴ Standard ethernet calculations give a maximum throughput of 35.7 Mpps.
⁵ MTBF is measured and calculated according to the Telcordia methodology, for data-path components only, with AC PSU(s) installed.
⁶ MTBF is measured and calculated according to the Telcordia methodology, for data-path components only, with AC PSU(s) installed, and no AT-ACC01 installed.
⁷ 0°C to 40°C (32°F to 104°F) for AT-9924T/4SP with AT-ACC01 installed.
⁸ With rubber feet height is 51 mm (2.00").
⁹ This depth measurement excludes the PSU handles.
¹⁰ One PSU.
¹¹ One PSU and one fan only module.

Standards and Protocols

Software Release 2.7.6

BGP-4

RFC 1771 Border Gateway Protocol 4
RFC 1997 BGP Communities Attribute
RFC 1998 Multi-home Routing
RFC 3065 Autonomous System Confederations for BGP
RFC 2842 Capabilities Advertisement with BGP-4
RFC 2858 Multiprotocol Extensions for BGP-4
RFC 2918 Route Refresh Capability for BGP-4
RFC 2439 BGP Route Flap Damping
RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option

Encryption

RFC 2104 HMAC
FIPS 180 SHA-1
FIPS 186 RSA
FIPS 46-3 DES
FIPS 46-3 3DES

Ethernet

RFC 894 Ethernet II Encapsulation
IEEE 802.1D MAC Bridges
IEEE 802.1Q Virtual LANs
IEEE 802.1v VLAN Classification by Protocol and Port
IEEE 802.2 Logical Link Control
IEEE 802.3ab 1000BASE-T
IEEE 802.3ac VLAN TAG
IEEE 802.3ad (LACP) Link Aggregation
IEEE 802.3u 100BASE-T
IEEE 802.3x Full Duplex Operation
IEEE 802.3z Gigabit ethernet

General Routing

RFC 768 UDP
RFC 791 IP
RFC 792 ICMP
RFC 1256 ICMP Router Discovery Messages
RFC 793 TCP
RFC 2822 Internet Message Format
RFC 826 ARP
RFC 903 Reverse ARP
RFC 925 Multi-LAN ARP
RFC 950 Subnetting, ICMP
RFC 1812 Router Requirements
RFC 1027 Proxy ARP
RFC 1122 Internet Host Requirements
RFC 1288 Finger
RFC 2390 Inverse Address Resolution Protocol
RFC 2131 DHCP
RFC 3046 DHCP Relay Agent Information Option
RFC 3993 Subscriber-ID Sub-option for DHCP Relay Agent Option
RFC 1542 BootP
RFC 2132 DHCP Options and BOOTP Vendor Extensions
RFC 1918 IP Addressing
RFC 3232 Assigned Numbers
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
RFC 1570 PPP LCP Extensions
RFC 1661 The Point-to-Point Protocol (PPP)
RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)
RFC 1762 The PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
RFC 1962 The PPP Compression Control Protocol (CCP)
RFC 1968 The PPP Encryption Control Protocol (ECP)

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RFC 1974 PPP Stac LZS Compression Protocol
RFC 1978 PPP Predictor Compression Protocol
RFC 1990 The PPP Multilink Protocol (MP)
RFC 2125 The PPP Bandwidth Allocation Protocol (BAP)
/ The PPP Bandwidth Allocation Control Protocol (BACP)
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 2661 L2TP

IP Multicasting

RFC 1075 DVMRP
RFC 1112 Host Extensions
RFC 1812 Router Requirements
RFC 2236 IGMPv2
RFC 2362 PIM-SM
RFC 3973 PIM-DM
RFC 2715 Interoperability Rules for Multicast Routing Protocols
draft-ietf-idmr-dvmrp-v3-9 DVMRP
draft-ietf-magma-snoop-02 IGMP and MLD snooping switches

IPv6

RFC 3596 DNS Extensions to support IPv6
RFC 1981 Path MTU Discovery for IPv6
RFC 2080 RIPng for IPv6
RFC 3513 IPv6 Addressing Architecture
RFC 2375 IPv6 Multicast Address Assignments
RFC 2460 IPv6
RFC 2461 Neighbour Discovery for IPv6
RFC 2462 IPv6 Stateless Address Autoconfiguration
RFC 2463 ICMPv6
RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
RFC 2472 IPv6 over PPP
RFC 2526 Reserved IPv6 Subnet Anycast Addresses
RFC 3484 Default Address Selection for IPv6
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
RFC 2711 IPv6 Router Alert Option
RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3315 DHCPv6
RFC 3587 IPv6 Global Unicast Address Format
RFC 2365 Administratively Scoped IP Multicast
RFC 3307 Allocation Guidelines for IPv6 Multicast Addresses
RFC 2465 Allocation Guidelines for IPv6 Multicast Addresses
Management Information Base for IP Version 6: Textual Conventions and General Group
RFC 2466 Management Information Base for IP Version 6: ICMPv6 Group
RFC 2851 Textual Conventions for Internet Network Addresses

Management

RFC 1155 MIB
RFC 1157 SNMP
RFC 1212 Concise MIB definitions
RFC 1213 MIB-II
RFC 1643 Ethernet MIB
RFC 1493 Bridge MIB
RFC 2790 Host MIB
RFC 1515 Definitions of Managed Objects for IEEE 802.3 MAUs
RFC 1573 Evolution of the Interfaces Group of MIB-II
RFC 1657 Definitions of Managed Objects for BGP-4 using SMIv2
RFC 1757 RMON (groups 1,2,3 and 9)
RFC 2011 SNMPv2 MIB for IP using SMIv2

RFC 2012 SNMPv2 MIB for TCP using SMIv2
RFC 2096 IP Forwarding Table MIB
RFC 3768 VRRP
RFC 2576 Coexistence between V1, V2, and V3 of the Internet-standard Network Management Framework
RFC 2578 Structure of Management Information Version 2 (SMIv2)
RFC 2579 Textual Conventions for SMIv2
RFC 2580 Conformance Statements for SMIv2
RFC 2665 Definitions of Managed Objects for the Ethernet-like Interface Types
RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering and Virtual LAN Extensions (VLAN)
RFC 2856 Textual Conventions for Additional High Capacity Data Types
RFC 3164 Syslog Protocol
RFC 3410 Introduction and Applicability Statements for Internet-Standard Management Framework
RFC 3411 An Architecture for Describing SNMP Management Frameworks
RFC 3412 Message Processing and Dispatching for the SNMP
RFC 3413 SNMP Applications
RFC 3414 User-based Security Model (USM) for SNMPv3
RFC 3415 View-based Access Control Model (VACM) for the SNMP
RFC 3416 Version 2 of the Protocol Operations for SNMP
RFC 3417 Transport Mappings for the SNMP
RFC 3418 MIB for SNMP
draft-ietf-bridge-8021x-00.txt Port Access Control MIB

OSPF

RFC 1245 OSPF protocol analysis
RFC 1246 Experience with the OSPF protocol
RFC 1587 The OSPF NSSA Option
RFC 2328

QoS

RFC 1349 Type of Service in the IP Suite
RFC 2205 Reservation Protocol
RFC 2211 Controlled-Load
RFC 2475 An Architecture for Differentiated Services
IEEE 802.1p Priority Tagging
RFC 2697 A Single Rate Three Color Marker
RFC 2698 A Two Rate Three Color Marker

RIP

RFC 1058 RIPv1
RFC 1723 RIPv2

Security

RFC 1492 TACACS
RFC 1779 X.500 String Representation of Distinguished Names
RFC 1858 Fragmentation
RFC 2865 RADIUS
RFC 2866 RADIUS Accounting
RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 3580 IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines
RFC 2459 X.509 Certificate and CRL profile
RFC 2510 PKI X.509 Certificate Management Protocols
RFC 2511 X.509 Certificate Request Message Format
RFC 2559 PKI X.509 LDAPv2
RFC 2585 PKI X.509 Operational Protocols
RFC 2587 PKI X.509 LDAPv2 Schema
draft-grant-tacacs-02.txt TACACS+
draft-IETF-PKIX-CMP-Transport-Protocols-01 Transport Protocols for CMP
draft-ylonen-ssh-protocol-00.txt SSH Remote Login Protocol

IEEE 802.1x Port Based Network Access Control
PKCS #10 Certificate Request Syntax Standard

Services

RFC 2821 SMTP
RFC 854 Telnet Protocol Specification
RFC 855 Telnet Option Specifications
RFC 856 Telnet Binary Transmission
RFC 857 Telnet Echo Option
RFC 858 Telnet Suppress Go Ahead Option
RFC 932 Subnetwork addressing scheme
RFC 1305 NTPv3
RFC 1091 Telnet terminal-type option
RFC 1179 Line printer daemon protocol
RFC 1350 TFTP
RFC 1510 Network Authentication
RFC 2049 MIME
RFC 1985 SMTP Service Extension
RFC 2156 MIXER
RFC 1945 HTTP/1.0

SSL

RFC 2246 The TLS Protocol Version 1.0
draft-freier-ssl-version3-02.txt SSLv3

STP / RSTP / MSTP

IEEE 802.1Q - 2003 MSTP (802.1s)
IEEE 802.1t - 2001 802.1D maintenance
IEEE 802.1w - 2001 RSTP

About Allied Telesyn

Allied Telesyn was founded in 1987 and now has offices around the globe, more than 2,800 employees and over \$500M of worldwide annual revenue. The attributes which have led Allied Telesyn to achieve its leading position in the enterprise, operator and connectivity business segments can be summarised by four key elements: its business focus on networking technology for professional markets, where Allied Telesyn has proved to be the only company capable of providing a total end-to-end solution at a high price/performance ratio; the ability to handle every aspect of its own products from design to marketing; the development of components and solutions which accommodate flexible, efficient and reliable network construction; and support from sound warranty terms and quality services. Allied Telesyn connects the IP world efficiently thanks to affordable and highly reliable network solutions. For more information see: www.alliedtelesyn.com

Service & Support

Allied Telesyn provides value-added support services for its customers under its Net.CoverSM programs. For more information on Net.CoverSM support programs available in your area, contact your Allied Telesyn sales representative or visit our website. www.alliedtelesyn.com

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Ordering Information

AT-9924T-xx

24 x 10/100/1000BASE-T and 4 x 1000BASE-X SFP combo ports and 256MB of SDRAM factory fitted.
Order number: 990-12692-xx

AT-9924SP-xx

24 x 1000BASE-X SFP ports and 256MB of SDRAM factory fitted.
Order number: 990-12693-xx

AT-9924T/4SP-P-xx

24 x 10/100/1000BASE-T and 4 x 1000BASE-X SFP combo ports. IPv6 hardware version with 512MB of SDRAM and an IPv6 accelerator card factory fitted.
Order number: 990-12631-xx

AT-9924T/4SP-A-xx

24 x 10/100/1000BASE-T and 4 x 1000BASE-X SFP combo ports. IPv4 hardware version with 256MB of SDRAM and support for AT-ACC01 IPv6 accelerator card for future upgrade to high speed IPv6 capability.
Order number: 990-12630-xx

Where xx = 10 for U.S. power cord
20 for no power cord
30 of U.K. power cord
40 for Asia/Pacific power cord
50 for European power cord
80 for 48V DC power supply

All AT-9900 series switches include a single PSU module.

The AT-9924T/4SP also includes a fan only module (this is a blanking module containing cooling fans that occupies the spare PSU position. It must be fitted when a second PSU is not present in the 9924T/4SP).

IPv6 Accelerator Card

AT-ACC01 IPv6 accelerator card. (A minimum of 512MB of SDRAM is required if this card is to be fitted)

NB: Specifying the AT-9924T/4SP-P-xx will ensure that the IPv6 accelerator card will be factory fitted. Ordering this card separately will require it to be retro-fitted to an AT-9924T/4SP-A-xx, which must be performed by a qualified service technician.
Order number: 990-97705-00

SDRAM

AT-SD128A-00

128MB SDRAM (Not applicable for 9924T/4SP)
Order number: 990-12213-00

AT-SD256A-00

256MB SDRAM
Order number: 990-12214-00

AT-SD512A-00

512MB SDRAM (Only applicable for 9924T/4SP)
Order number: 990-12211-00

The AT-9924T, AT-9924SP and the AT-9924T/4SP-A are shipped with 256MB of SDRAM, which provides capacity up to 256K IPv4 routes. The AT-9924T/4SP-P is shipped with 512MB of SDRAM that provides capacity for up to 256K IPv4 routes and 64K IPv6 routes.

Compact Flash

Please check for availability

SFP modules

AT-SPTX

10/100/1000T 100m Copper
Order number: 990-000262-00

AT-SPSX

GbE multi-mode 850nm fiber
Order number: 990-00028-00

AT-SPLX10

GbE single-mode 1310nm fiber up to 10km
Order number: 990-00029-00

AT-SPLX40

GbE single-mode 1310nm fiber up to 40km
Order number: 990-00161-00

AT-SPLX40/1550

GbE single-mode 1550nm fiber up to 40km
Order number: 990-00160-00

AT-SPZX80

GbE single-mode 1550nm fiber up to 80km
Order number: 990-00031-00

AT-SPZX80/wwwww

GbE single-mode CWDM fiber up to 80km
Order number: 990-000xx-00

Where wwwww=	Where xx=	CWDM Wavelength
1610	32	1610NM
1590	33	1590NM
1570	34	1570NM
1550	35	1550NM
1530	36	1530NM
1510	37	1510NM
1490	38	1490NM
1470	39	1470NM

Power Supply Units

AT-PWR01-xx

Power supply module
Spare hot-swappable load-sharing power supply modules for the AT-9924 series of switches
Order number: 990-10204-xx

Where xx = 10 for U.S. power cord
20 for no power cord
30 of U.K. power cord
40 for Asia/Pacific power cord
50 for European power cord
80 for 48V DC power supply

Fan module

AT-FAN01-00

Spare Fan only module (FOM) for the 9924T/4SP
Order number: 990-10205-00

Software Options

AT-9900FL3UPGRD

AT-9924 full Layer 3 upgrade:

- RSVP
- DVMRP
- VRRP
- PIM SM
- PIM DM

Order number: 980-000001-yyy

AT-9900ADVL3UPGRD

AT-9924 series advanced Layer 3 upgrade:

- IPv6
- BGP-4

Order number: 980-000009-yyy

AT-AR-VLANDTAG

AT-9924 VLAN double tagging (Q-in-Q / Nested VLANs) upgrade:
Order number: 980-10041-yyy

AT-AR-3DES (for SSL and SSH)

AT-9924 3DES upgrade:
Order number: 980-10000-yyy

Where yyy= 00 for 1 shot
001 for 1 licence
005 for 5 licences
010 for 10 licences
025 for 25 licences
050 for 50 licences
100 for 100 licences
250 for 250 licences

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