



# AT-x900-24X SERIES

## Advanced Gigabit Layer 3+ Expandable Switch

### AT-x900-24XT

2 x 30Gbps expansion bays  
24 x 10/100/1000BASE-T (RJ-45) copper ports

### AT-x900-24XS

2 x 30Gbps expansion bays  
24 x 1000BASE-X SFP ports

### Unmatched Flexibility

AT- x900- 24X 시리즈는 Layer 3+ 스위치로, 2 개의 high- speed 의 30Gbps 확장베이를 갖추고 있는데, 이는 네트워크 시장에서 그러면 1RU Gigabit ethernet 스위치보다 높은 수준의 포트 유연성 및 어플리케이션 융통성을 제공합니다. 또한 확장 모듈은 광범위한 네트워킹 요구사항에 맞는 솔루션을 제공함으로써 다양한 환경에서 구성하여 사용될 수 있습니다.

10GbE 확장모듈과 hot- swappable XFPs 는 high- speed, 대용량 fiber 업링크를 제공하며, 네트워크 core 에서 10Gbps 나 20Gbps 업링크 용량을 선택할 수 있습니다. 2 개 10GbE 모듈과 MSTP(802.1s) 를 이용하여 Link 오류시 빠른 Failover 기술을 바탕으로 신속히 복구하며, 데스크탑 링크로의 Gigabit wiring closet 그룹 및 다른 네트워크 스위치로부터의 Gigabit 업링크를 통합하여 연결하는 데 적합합니다.

sub 50ms failover 에서 protected 링을 구축하기 위하여, EPSS(Ethernet Protected Switched Rings)와 10GbE 모듈을 이용함으로써, 여러 개의 AT- x900- 24X 스위치를 연결할 수 있습니다. 이러한 기능은 엔터프라이즈 core 나 프로바이더 access 네트워크에서 완벽하고 뛰어난 수행능력을 발휘할 수 있습니다.

한 개 또는 두 개의 12 포트 10/100/1000BASE- T(RJ- 45) copper 확장 모듈을 결합 시킴으로써, AT- x900- 24X 는 데스크탑으로의 Gigabit 이나 Gigabit 어플리케이션에 적합한 솔루션입니다.

12 x 1000 BASE- X(SFP) 확장모듈은 server farm 과 data center 어플리케이션에서 혼합된 copper 및 fiber 링크를 통합하기 위하여 다양한 포트 옵션을 제공합니다.

### Key Features

#### Performance

- 2 x 10/100 WAN interfaces
- Layer 2 and 3 IPv4 and IPv6 switching and routing all at wire-speed<sup>2</sup>
- Built from a 168Gbps switch fabric yielding 71.4 Million packets per second performance
- Provides up to 256K IPv4 route entries
- Supports full 4096 VLANs
- Supports 4096 Layer 3 interfaces
- VLAN double tagging
- Private VLANs, providing security and port isolation of multiple customers using the same VLAN
- Supports 9KB Jumbo frame size<sup>3</sup> for data center and server aggregation applications
- Gigabit SFP ports will support any combination of 10/100/1000BASE-T, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX or 1000BASE-ZX CWDM SFPs
- Extensive wire-speed traffic classification for ACLs and QoS
- Advanced routing protocols OSPF, BGP-4, RIP, RIPv2 and RIPv6, DVMRP, PIM-SM, PIM-DM
- Wire-speed multicasting

#### Reliability and Future Proofing

- Two 30Gbps expansion bays supporting a choice of modules, including 1x 10GbE, 12 x 1GbE (SFP), and 12 x 1GbE (RJ45) for port flexibility and application versatility
- 1RU form factor, high port density and front-to-back cooling, ideal for high density rack and wiring closet installations
- Eliminates the need for redundant power supplies by providing power supplies that are hot-swappable and load-sharing
- Full environmental monitoring of PSUs, fans, temperature and internal voltages, with SNMP traps to alert network managers in case of any failure
- Cable fault detection – total cable length and distance to fault (fixed copper ports only)

### Quality of Service

- Policy based QoS features
- Highly configurable traffic classification
- Buffered multiple packet remarking options at egress on all ports, and on each of 8 egress queues per port
- Twin-rate three-level (green, yellow, red) bandwidth metering, with burst sizes for improved TCP-IP bandwidth limiting performance and bandwidth resolution down to 1Kbps
- Low switching latency essential for Voice over IP(VoIP) and real-time streaming media applications

### Resiliency

- STP, RSTP, MSTP (802.1s)
- Port trunking (802.3ad LACP)
- VRRP
- EPSS

### Management

- Out of band 10/100/1000 Ethernet management port and asynchronous management port, both on the front panel for ease of access
- An SD memory card socket on the front panel, allowing software release files, configurations and other files to be stored for backup and distribution to other switches
- Port mirroring
- SSH, SSL, SFTP and SNMPv3 for secure management
- 802.1x support
- TACACS+, RADIUS

1 NEBS (Network Equipment Building System) is a series of safety and conformance standards applied to telecommunications equipment in North America.

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

# AT-x900-24X Series | Advanced Gigabit Layer 3+ Expandable Switch

AT- x900- 24X L3+ 스위치는 Compact 1RU chassis 에서 최대 Gigabit ethernet 포트를 제공하고, 이러한 유연성은 변화하는 네트워크 인프라 구조, 포트들의 Topology, 물리적인 링크 요구사항에 적합한 솔루션이므로, 장기적인 투자 효과를 가져다 줄 것입니다.

## Reliability

1RU Rack mount 스위치에 포함되어 있는 Dual hot- swappable AC 또는 - 48V DC load- sharing power supply 는 공간절약, 신뢰성, 무중단 서비스를 제공합니다. 이러한 기능과 Front to back 냉각 방식이 혼합된 AT- x900- 24X 시리즈는 공간이 제한적인 환경에서도 완벽하게 작동 합니다.

## Policy-Based Quality of Service

Wirespeed 로 동작되는 통합 Low latency QoS 기능은 분류, 우선 순위화, 트래픽 shaping, 최대 및 최소 대역기능을 flow- based 트래픽을 관리합니다. AT- x900- 24X QoS 기능은 음성, 비디오, 데이터 서비스를 제공하고, 고객의 요구에 맞는 SLA(Service Level Agreement)로 관리합니다. 또한, 이러한 QoS 기능이 사업상 중요한 어플리케이션 (VoIP 서비스 포함)의 수행능력을 보장함으로써 생산성을 향상시키고, 근무환경에서 엔터프라이즈 어플리케이션을 재건하고 유지하는 것을 돕기 때문에, 기업 고객에게도 아주 적합한 제품입니다.

## Performance

AT- x900- 24X 시리즈는 168Gbps 스위칭 fabric 을 갖춘 강력한 Layer 3+ 스위치로써, 110.1Mpps 전송률로 wire-speed IPv4, IPv6 스위칭, 라우팅 성능을 완벽하게 수행합니다. 고성능 네트워크 어플리케이션의 높은 수행능력을 위하여 2 개의 wire- speed 10GbE 포트까지 지원 할 수 있습니다.

## Performance

Switching Fabric 168Gbps  
Forwarding Rate 110.1Mpps<sup>5</sup>  
Up to 256K IPv4 routes  
12K MAC addresses typical  
Up to 4K layer 2 multicast groups  
Up to 1K layer 3 IPv4 multicast groups  
4K VLANs  
512MB CPU SDRAM  
128MB Packet buffer memory  
32MB Flash Memory

## Reliability

MTBF  
x900-24X with 1 PSU and 1 fan module:  
93,700 hours  
x900-24X with 2 PSUs:  
249,400 hours  
(calculated using Telcordia SR-332 (Issue 1, May 2001) at 25oC ambient operating temperature)

## Power Characteristics

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

DC  
Voltage: 36 to 72V

## Power Consumption

x900-24X with 1 PSU and 1 fan module:  
110 Watts / 375 BTU  
x900-24X with 2 PSUs and 2 XEM-1XP modules:  
191 Watts / 652 BTU

## Power Characteristics

Operating Temperature Range:  
0°C to 40°C (32°F to 104°F)  
Derated by 1°C per 305 Meters (1000ft)

Storage Temperature Range:  
-25°C to 70°C (-13°F to 158°F)

Operating Relative Humidity Range:  
5% to 80% non-condensing

Storage Relative Humidity Range:  
5% to 95% non-condensing

Altitude:  
3,050 Meters maximum (10,000ft)

## Physical Dimensions

Height: 44.5mm (1.75")  
Width: 440mm (16.7")  
Depth: 440mm (16.7")<sup>6</sup>  
Mounting: 19" rack mountable, 1RU form-factor

## Weight

x900-24X with 1 PSU and 1 fan module:  
7.3kg (16.1lbs), and 8.8kg (19.4lbs) packaged

x900-24X with 2 PSUs and 2 XEM-1XP modules:  
9.3kg (20.5lbs), and 10.8kg (23.8lbs) packaged

AT-PWR01 (AC or DC): 1.0kg, and packaged 1.8kg (3.9lbs) (AC) or 1.5kg (3.3lbs) (DC)

AT-FAN01: 0.6kg (1.3lbs), and 1.4kg (3.1lbs) packaged

## Electrical Approvals and Compliances

EMC: EN55022 class A, FCC class A, VCCI class A  
Immunity: EN55024, EN61000-3-levels 2 (Harmonics), and 3 (Flicker) – AC models only  
NEBS: GR63, GR1089 level 3 – x900-24XT-N, XEM-1XT, XEM-12S, and XEM-12T-N only

## Safety

Standards: UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950-1, EN60825-1, AS/NZS 60950

Certification: UL, cUL, TUV

## Restrictions on Hazardous Substances (RoHS) Compliance

EU RoHS Compliant

## Physical Dimensions

Singapore

3 With two 12 x 1GbE expansion modules (SFP or RJ45) installed.  
4 This depth measurement excludes the PSU handles.

## Standards and Protocols

Software Release 3.2.1

### Authentication

IEEE 802.1x Port Based Network Access Control  
 RFC 1510 Network Authentication Service (Kerberos V5)  
 RFC 2082 RIP-2 MD5 Authentication

### BGP-4

RFC 1771 Border Gateway Protocol 4  
 RFC 1966 BGP Route Reflection - An Alternative to Full Mesh IBGP  
 RFC 1997 BGP Communities Attribute  
 RFC 1998 Multi-home Routing  
 RFC 2385 Protection of BGP Sessions via the TCP MD5

Signature Option

RFC 2439 BGP Route Flap Damping  
 RFC 2858 Multiprotocol Extensions for BGP-4  
 RFC 2918 Route Refresh Capability for BGP-4  
 RFC 3065 Autonomous System Confederations for BGP  
 RFC 3392 Capabilities Advertisement with BGP-4

### Discovery Protocols

CDP over WAN Forward Cisco Discovery Protocol packets over a WAN connection

### Encryption

Diffie-Hellman key-exchange algorithm  
 FIPS 180 Secure Hash Signature Standard. This Standard specifies four secure hash algorithms - SHA-1, SHA-256, SHA-384, and SHA-512  
 FIPS 186 Digital Signature Standard. (RSA)  
 FIPS 46-3 Data Encryption Standard (DES & 3DES)  
 RFC 1321 The MD5 Message-Digest Algorithm  
 RFC 2104 HMAC - Keyed-Hashing for Message Authentication

### Ethernet

GARP Generic Attribute Registration Protocol  
 GVRP Generic VLAN Registration Protocol  
 IEEE 802.2 Logical Link Control  
 IEEE 802.3 Ethernet CSMA/CD  
 IEEE 802.3ab 1000BASE-T  
 IEEE 802.3ad Link Aggregation Control Protocol (LACP)  
 IEEE 802.3ad Link Aggregation (Port Trunking)  
 IEEE 802.3ae 10 Gigabit Ethernet  
 IEEE 802.3u 100BASE-T  
 IEEE 802.3x Flow Control - Full Duplex Operation  
 IEEE 802.3z Gigabit Ethernet

### General Routing

ECMP Equal Cost Multi Path routing  
 RFC 768 User Datagram Protocol (UDP)  
 RFC 791 Internet Protocol (IP)  
 RFC 792 Internet Control Message Protocol (ICMP)  
 RFC 793 Transmission Control Protocol (TCP)  
 RFC 826 Address Resolution Protocol (ARP)  
 RFC 894 Standard for the transmission of IP datagrams over Ethernet networks

RFC 903 Reverse ARP  
 RFC 919 Broadcasting Internet Datagrams  
 RFC 922 Broadcasting Internet datagrams in the presence of subnets  
 RFC 925 Multi-LAN ARP  
 RFC 950 Internet Standard Subnetting Procedure  
 RFC 1027 Proxy ARP  
 RFC 1035 DNS Client  
 RFC 1042 Standard for the transmission of IP datagrams over IEEE 802 networks  
 RFC 1071 Computing the Internet checksum  
 RFC 1122 Internet Host Requirements  
 RFC 1191 Path MTU discovery  
 RFC 1256 ICMP Router Discovery Messages  
 RFC 1288 Finger  
 RFC 1518 An Architecture for IP Address Allocation with CIDR  
 RFC 1519 Classless Inter-Domain Routing CIDR  
 RFC 1541 DHCPv4 Client & Server  
 RFC 1542 BootP  
 RFC 1700 Assigned Numbers  
 RFC 1812 Requirements for IP Version 4 Routers  
 RFC 1918 IP Addressing  
 RFC 2131 DHCP  
 RFC 2132 DHCP Options and BOOTP Vendor Extensions.  
 RFC 2390 Inverse Address Resolution Protocol  
 RFC 2581 TCP Congestion Control  
 RFC 2822 Internet Message Format  
 RFC 3046 DHCP Relay Agent Information Option  
 RFC 3232 Assigned Numbers  
 RFC 3993 Subscriber-ID Suboption for DHCP Relay Agent Option

### IPv6 Features

draft-arkko-manual-icmpv6-sas-01 Manual SA Configuration for IPv6 Link Local Messages  
 draft-ietf-ngtrans-hometun-01 IPv6 over IPv4 tunnels for home to Internet access  
 draft-ietf-ngtrans-introduction-to-ipv6-transition-06 Overview to the introduction of IPv6 in the internet  
 RFC 1886 DNS Extensions to support IP version 6  
 RFC 1981 Path MTU Discovery for IPv6  
 RFC 2365 Administratively Scoped IP Multicast  
 RFC 2375 IPv6 Multicast Address Assignments  
 RFC 2460 IPv6 specification  
 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 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels  
 RFC 2711 IPv6 Router Alert Option  
 RFC 2851 Textual Conventions for Internet Network Addresses  
 RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers  
 RFC 3056 Connection of IPv6 Domains via IPv4 Clouds  
 RFC 3307 Allocation Guidelines for IPv6 Multicast Addresses  
 RFC 3315 DHCPv6  
 RFC 3484 Default Address Selection for IPv6  
 RFC 3513 IPv6 Addressing Architecture  
 RFC 3587 IPv6 Global Unicast Address Format  
 RFC 3596 DNS Extensions to support IPv6

## Management

RFC 1155 Structure and Identification of Management Information for TCP/IP-based Internets  
 RFC 1157 A Simple Network Management Protocol(SNMP)  
 RFC 1212 Concise MIB definitions  
 RFC 1213 Management Information Base for Network Management of TCP/IP-based internets: MIB-II  
 RFC 1215 Convention for defining traps for use with the SNMP  
 RFC 1239 Standard MIB  
 RFC 1493 Bridge MIB  
 RFC 1623 Ethernet MIB  
 RFC 1657 Definitions of Managed Objects for BGP-4 using SMIv2  
 RFC 2011 SNMPv2 MIB for IP using SMIv2  
 RFC 2012 SNMPv2 MIB for TCP using SMIv2  
 RFC 2096 IP Forwarding Table MIB  
 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 2790 Host MIB  
 RFC 2819 RMON MIB  
 RFC 2856 Textual Conventions for Additional High Capacity Data Types  
 RFC 2863 The Interfaces Group MIB  
 RFC 3164 Syslog Protocol  
 RFC 3289 Management Information Base for the Differentiated Services Architecture  
 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 SNMP  
 RFC 3413 SNMP Applications  
 RFC 3414 User-based Security Model (USM) for SNMPv3  
 RFC 3415 View-based Access Control Model (VACM) for SNMP  
 RFC 3416 Version 2 of the Protocol Operations for SNMP  
 RFC 3417 Transport Mappings for the SNMP  
 RFC 3418 MIB for SNMP  
 RFC 3635 Definitions of Managed Objects for the Ethernetlike Interface Types  
 RFC 3636 Definitions of Managed Objects for IEEE 802.3 Medium Attachments Units (MAUs)  
 RFC 4188 Definitions of Managed Objects for Bridges  
 RFC 4273 Definitions of Managed Objects for BGP-4  
 draft-ietf-bridge-802.1x-00.txt  
 IEEE 802.1x Port Access Control MIB

## Multicast Support

RFC 1075 DVMRP  
RFC 1112 Host extensions for IP multicasting  
RFC 2236 Internet Group Management Protocol (IGMP), Version 2  
RFC 2363 Protocol Independent Multicast Sparse-Mode (PIMSM)  
RFC 2710 Multicast Listener Discovery (MLDv2) for IPv6  
RFC 2715 Interoperability Rules for Multicast Routing Protocols  
RFC 2973 PIM-DM  
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6  
draft-ietf-idmr-dvmrp-v3-10 DVMRPv3  
draft-ietf-magma-snoop-02 IGMP and MLD snooping switches  
draft-ietf-pim-sm-v2-new-12.txt Protocol Independent  
Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised)  
draft-vida-ml-d-v2 Multicast Listener Discovery (MLDv2) for IPv6  
IGMP Proxy draft-ietf-magma-igmp-proxy-05  
IGMP Snooping Internet Group Management Protocol Snooping

## OSPF

RFC 1245 OSPF protocol analysis  
RFC 1246 Experience with the OSPF protocol  
RFC 2328 OSPFv2  
RFC 3101 The OSPF Not-So-Stubby Area (NSSA) Option

## PKI Support

RFC 1779 X.509 String Representation of Distinguished Names.  
RFC 2510 PKI X.509 Certificate Management Protocols  
RFC 2511 X.509 Certificate Request Message Format  
RFC 2527 Internet X.509 Public Key Infrastructure Certificate Policy and Certification Practices Framework  
RFC 2559 PKI X.509 LDAPv2  
RFC 2585 PKI X.509 Operational Protocols  
RFC 2587 PKI X.509 LDAPv2 Schema  
RFC 3279 Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile.  
RFC 3280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile.  
Draft-IETF-PKIX-CMP-Transport-Protocols-01 Transport Protocols for CMP  
PKCS #10 Certification Request Syntax Standard

## Quality of Service

RFC 2205 Reservation Protocol (RSVP)  
RFC 2211 Specification of the Controlled-Load Network Element Service  
RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers  
RFC 2475 An Architecture for Differentiated Services  
RFC 2597 Assured Forwarding PHB Group  
RFC 2697 A Single Rate Three Color Marker  
RFC 2698 A Two Rate Three Color Marker

RFC 3246 An Expedited Forwarding PHB (Per-Hop Behavior) Combined strict priority & WRR queuing Combined strict priority queuing and weighted round robin queuing DiffServ Differentiated Services  
IEEE 802.1p Priority Tagging

## Redundancy

EPSR Ethernet Protection Switched Rings  
RFC 3768 VRRP  
IEEE 802.1D STP - Spanning Tree Protocol (MAC Bridges)  
IEEE 802.1s MSTP - Multiple overlapping spanning trees  
IEEE 802.1t - 2001802.1D maintenance  
IEEE 802.1w - 2001 RSTP

## Routing Protocols

RFC 1058 Routing Information Protocol (RIP)  
RFC 2080 RIPng for IPv6  
RFC 2081 RIPng Protocol Applicability Statement  
RFC 2453 RIP Version 2

## Security Features

RFC 1492 TACACS  
RFC 1858 Fragmentation  
RFC 2246 The TLS Protocol Version 1.0  
RFC 2865 RADIUS  
RFC 2866 RADIUS Accounting  
RFC 2868 RADIUS Attributes for Tunnel Protocol Support  
RFC 4251 The Secure Shell (SSH) Protocol Architecture  
SSHv1.5 Secure Shell server v1.5 SSLv2  
[http://wp.netscape.com/eng/security/ssl\\_2.html](http://wp.netscape.com/eng/security/ssl_2.html)  
SSLv3  
<http://wp.netscape.com/eng/ssl3/draft302.txt>  
draft-freier-ssl-version3-02.txt SSLv3  
draft-grant-tacacs-02.txt TACACS+  
draft-ylonen-ssh-protocol-00.txt SSH Remote Login Protocol

## Services

RFC 854 Telnet Protocol Specification  
RFC 855 Telnet Option Specifications  
RFC 857 Telnet Echo Option  
RFC 858 Telnet Suppress Go Ahead Option  
RFC 932 Subnetwork addressing scheme  
RFC 1091 Telnet terminal-type option  
RFC 1305 Network Time Protocol (NTPv3)  
RFC 1350 Trivial File Transfer Protocol (TFTP)  
RFC 1413 IDP  
RFC 1945 HTTP/1.0  
RFC 1985 SMTP Service Extension  
RFC 2049 MIME  
RFC 2068 HTTP/1.1  
RFC 2217 Telnet Com Port Control Option  
RFC 2616 Hypertext Transfer Protocol - HTTP/1.1  
RFC 2821 SMTP  
RFC 2822 Internet Message Format SCP Secure Copy

## VLAN Support

IEEE 802.1ad VLAN double tagging  
IEEE 802.1Q Virtual LANS  
IEEE 802.1v VLAN classification by protocol & port  
IEEE 802.3ac VLAN tagging

## Ordering Information

### AT-x900-24XT

Enhanced Gigabit Layer 3+ Expandable Switch  
2 x 30 Gigabit Expansion Bays + 24 x 10/100/1000BASE-T (RJ-45) ports

1 PSU and fan only module  
Order number: 990-000996-xx

2 PSUs  
Order number: 990-001145-zz

### AT-x900-24XT-N

NEBS Compliant Enhanced Gigabit Layer 3+ Expandable Switch  
2 x 30 Gigabit Expansion Bays + 24 x 10/100/1000BASE-T (RJ-45) ports

1 PSU and fan only module  
Order number: 990-001297-85

2 PSUs  
Order number: 990-001150-85

### AT-x900-24XS

Enhanced Gigabit Layer 3+ Expandable Switch  
2 x 30 Gigabit Expansion bays + 24 x 1000BASE-X SFP ports

1 PSU and fan only module  
Order number: 990-001000-xx

2 PSUs  
Order number: 990-001146-zz

Where xx = 00 for all power cords  
20 for no power cord  
80 for 48V DC power supply  
Where zz = 10 for U.S. power cord  
20 for no power cord  
30 for U.K. power cord  
40 for Asia/Pacific power cord  
50 for European power cord  
80 for 48V DC power supply

## Expansion Modules

### AT-XEM-1XP NEBS compliant

1 x 10GbE (XFP)  
Order number: 990-000997-00

### AT-XEM-12S NEBS compliant

12 x 1000BASE-X SFP ports  
Order number: 990-000998-00

### AT-XEM-12T

12 x 10/100/1000BASE-T (RJ-45) ports  
Order number: 990-000999-00



## SFP Modules<sup>5</sup>

### AT-SPFX/2

100BASE-FX 1310nm fiber up to 2km  
Order number: 990-001198-00

### AT-SPFX/15

100BASE-FX 1310nm fiber up to 15km  
Order number: 990-001199-00

### AT-SPFX/40

100BASE-FX 1310nm fiber up to 40km  
Order number: 990-001200-00

### AT-SPTX

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

### AT-SPSX

1000BASE-SX  
GbE multi-mode 850nm fiber  
Order number: 990-00028-00

### AT-SPLX10

1000BASE-LX  
GbE single-mode 1310nm fiber up to 10km  
Order number: 990-00029-00

### AT-SPLX40

1000BASE-LX  
GbE single-mode 1310nm fiber up to 40km  
Order number: 990-00161-00

### AT-SPLX40/1550

1000BASE-LX  
GbE single-mode 1550nm fiber up to 40km  
Order number: 990-00160-00

### AT-SPZX80

1000BASE-LX  
GbE single-mode 1550nm fiber up to 80km  
Order number: 990-00031-00

### AT-SPZX80/wwwww

1000BASE-LX  
GbE single-mode CWDM fiber up to 80km  
Order number: 990-000xx-00

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

<sup>5</sup> Please check with your sales representative, for ROHS compliance on SFP modules.

## 10GbE XFP Modules for use with XEM-IXP

### AT-XPSR

10GBASE-SR  
850nm Short-haul, 300m with MMF  
Order number: 990-000387-00

### AT-XPLR

10GBASE-LR  
1310nm Medium-haul, 10km with SMF  
Order number: 990-00086-00

### AT-XPER40

10GBASE-ER  
1550nm Long-haul, 40km with SMF  
Order number: 990-000584-00

## Power Supply and fan module

### AT-PWR01

Hot-swappable load-sharing power supply  
Order number: 990-001084-zz

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

### AT-FAN01

Fan only module  
Order number: 990-001085-00

## Feature licenses

### AT-9900FL3UPGRD

x900-24 Full Layer 3 upgrade:  
• RSVP  
• DVMRP  
• VRRP  
• PIM SM  
• PIM DM  
Order number: 980-000001-00

### AT-9900ADVL3UPGRD

x900-24 Advanced Layer 3 upgrade:  
• IPv6  
• BGP-4  
Order number: 980-000009-00

### AT-AR-VLANDTAG

VLAN double tagging upgrade  
Order number: 980-10041-00

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

3DES upgrade  
Order number: 980-10000-yyy

Where yyy = 00 for 1 temporary license  
01 for 1 license  
05 for 5 licenses  
10 for 10 licenses  
25 for 25 licenses  
50 for 50 licenses  
100 for 100 licenses  
250 for 250 licenses