SwitchBlade® x3112

Access Edge Chassis Switch

The Allied Telesis SwitchBlade® x3112 is a 12-slot access edge chassis switch, primarily targeted for service provider fiber access networks, and equally at home at the enterprise network edge and the data center. The switch was designed to deliver high availability, maximum performance with wirespeed non-blocking backplane functionality and high port count.

FTTx Service Provider Applications

The AT-SBx3112 is a versatile carrier-class FTTx platform for delivering Gigabit services to residential, Multi-Dwelling Unit (MDU) and business customers in the last mile. It features redundant power supplies, controllers and WAN ports to ensure reliability standards in carrier networks are met, along with powerful sub-50 millisecond failover protection using Ethernet Protection Switched Ring (EPSRing™) for link level protection. The AT-SBx3112 is available with either AC or DC power options.

As an FTTx platform, the AT-SBx3112 can support a maximum of 400 ports per chassis using 40-port 1000Mbps CSFP-based line cards (AT-SBx31GC40). The SBx3112 can also support redundant 10G uplinks using the four SFP/ SFP+ ports on the powerful Allied Telesis CFC960s central fabric control card or using 6-port SFP+-based line card (AT-SBx31XS6) or 4-port XFP-based line card (AT-SBx31XZ4). The AT-SBx3112 can act as an aggregation hub for last mile FTTx applications using 10G line cards. It features 80 Gigabit non-blocking throughput to each slot, thus providing a maximum level of performance for FTTx services, both 1G and 10G. Coupled with ultra-fast Allied Telesis 960 Gigabits central fabric control cards, FTTx services can operate at wirespeed connectivity.

An evolution of our tried and tested iMAP™ (integrated Multiservice Access Platform) carrier-grade platform, the AT-SBx3112 delivers true IP Triple Play services such as IPTV, VoIP, tiered High-Speed Internet Access (HSIA) and other cloud-based services such as over-the-top video, remote storage and backup and cloud computing.

The raw performance, combined with high availability of the AT-SBx3112, also allows it to be deployed as both end-of-row and aggregation in data center applications, and in campus applications as the ultimate in network edge connectivity.

High-Availability Architecture

The SwitchBlade x3112 is designed to deliver 99.999% reliability, while offering high availability with sub-millisecond hitless failover for mission-critical applications where uptime is essential such as data centers, hospitality, government and financial institutions.

Dual redundant management/switch fabric modules inter-connected through redundant paths to the line cards over a passive backplane, and dual redundant power options, ensures maximum system up-time. Power is delivered via up to two AC or DC system power supplies, and two Power over Ethernet (PoE) supplies to ensure continual operation.

Power over Ethernet Plus (PoE+)

The SwitchBlade x3112 supports IEEE 802.3at PoE+ (30W) to enable customers to futureproof their networks. PoE+ provides greater power for applications such as IP surveillance cameras supporting Pan, Tilt and Zoom, IP video phones, RFID readers, Point-of-Sale (POS) or Wireless Access Points.

Secure Management

Only authorized administrators can access the management interface of the SwitchBlade x3112. Protocols such as SSH provide an encrypted interface for both local and remote connections, with out-of-band management achieved through a dedicated Gigabit port, if required.

Securing the Network Edge

To ensure the protection of the data, it is important to control access to the network. Protocols such as IEEE 802.1x 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 the network, offering guests such benefits as Internet access while ensuring the integrity of private network data.

Secure Differentiation

QoS schemes for SwitchBlade x3112 access solutions are designed to ensure that application performance and availability are not impacted with network growth. Features such as IEEE 802.1p/Q enable tiered data services for residential, business and enterprise users or prioritize real-time applications such as IP phones and IP cameras.

Environmentally Friendly

In keeping with our commitment to environmentally-friendly processes and products, the SwitchBlade x3112 is designed to reduce power consumption and minimize hazardous waste. Features include the use of high-efficiency power supplies and low-power chip sets. The switches also include an eco-friendly button on the front panel allowing conservation of additional power by turning off all diagnostic LED indicators when they are not required.

Key Features

Performance
- Dual CFC960 central fabric control cards enable load sharing, providing 960Gbps throughput.

Power over Ethernet Plus
- Power over Ethernet Plus provides standards-based IEEE 802.at class 4 for up to 80 x 10/100/1000T ports or IEEE 802.3af at class 3 for up to 155 x 10/100/1000T ports.

Ethernet Protection Switched Ring (EPSRing™)
- EPSRing is a protection scheme for Ethernet networks, specifically for ring-based network topologies. EPSRing provides a sub 50 milliseconds switching time for an Ethernet-based ring network, to maintain Layer 2 redundancy in the network. EPSRing assists the multicast streams in being redirected around a faulty link in a ring network fast enough to result in an uninterrupted multicast service.

Spanning-Tree
- Supports STP, RSTP and MSTP.

Link Aggregation Group (LAG)
- The AT-SBx3112 supports a maximum of 127 LAGs configured on the system at one time. A maximum of eight member ports per LAG is supported.
- LACP functionality is also supported. With LACP, the AT-SBx3112 can exchange LACP messages with neighboring systems to allow for dynamic aggregation of links between systems.

VLAN and Tagging
- Supports 4K active VLANs.

Upstream Forwarding Only (UFO) Mode
- A VLAN can be created where all data on the VLAN from downstream ports must be forwarded only to the upstream port.

HVLAN (Port- and VLAN-based, VLAN Double Tagging)
- To help overcome the VLAN addressing limitation, an additional or outer tag can be added on top of the IEEE 802.1Q tagged or untagged frame. The use of the additional tag creates a Hierarchical VLAN (HVLAN).

IGMP Snooping
- IGMP snooping allows the product to conserve network bandwidth by limiting the Layer 2 forwarding of IP multicast packets only to the LAN segments that have expressed interest in receiving packets addressed to a multicast group.

Quality of Service (QoS)
- Classifies traffic based on user-defined flows such as voice, video or data services. Supports eight priority queues.

Access Control Lists (ACLs)
- Access Control Lists enable inspection of incoming frames and classify them based on various criteria. Specific ations 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 can also be applied to QoS.

Egress Port Rate Limiting
- Supports egress rate limiting for customer- and network-facing ports.

RADIUS/TACACS+ Authentication
- TACACS+ and RADIUS authentication operates by using an external server as a means to authenticate logins to the system.

IEEE 802.1x Port Authentication
- IEEE 802.1x provides port-based network access control for restricting access to networks based on authentication information.

Secure Shell (SSHv2)
- Provides secure remote logins into the Command-Line Interface (CLI).

Address Resolution Protocol (ARP) Filtering
- ARP filtering provides the ability to “authenticate” ARP messages to ensure that unauthorized ARP spoofing is not permitted.

Simple Network Management Protocol (SNMP)
- Supports SNMPv1 and SNMPv2c.

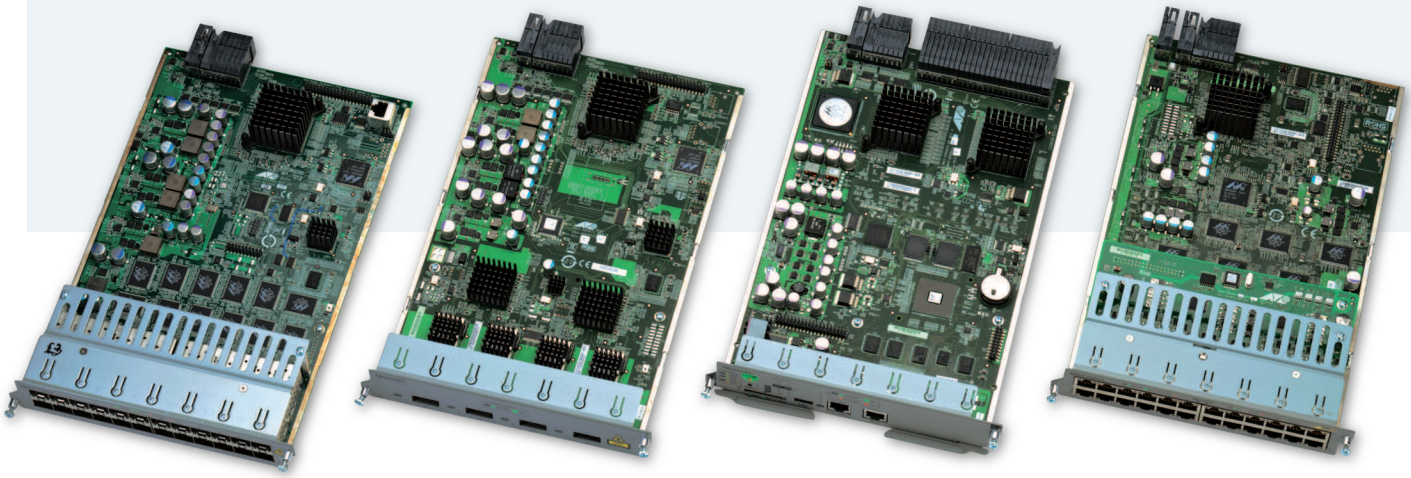
Link Layer Discovery Protocol (LLDP)
- LLDP is an application protocol that runs directly over Layer 2 in network elements to facilitate a centrally located network manager to derive the physical network topology the network elements are part of.

Remote Network Monitoring (RMON)
- A collection of traffic statistics over port interfaces, accrued in a specified time period.

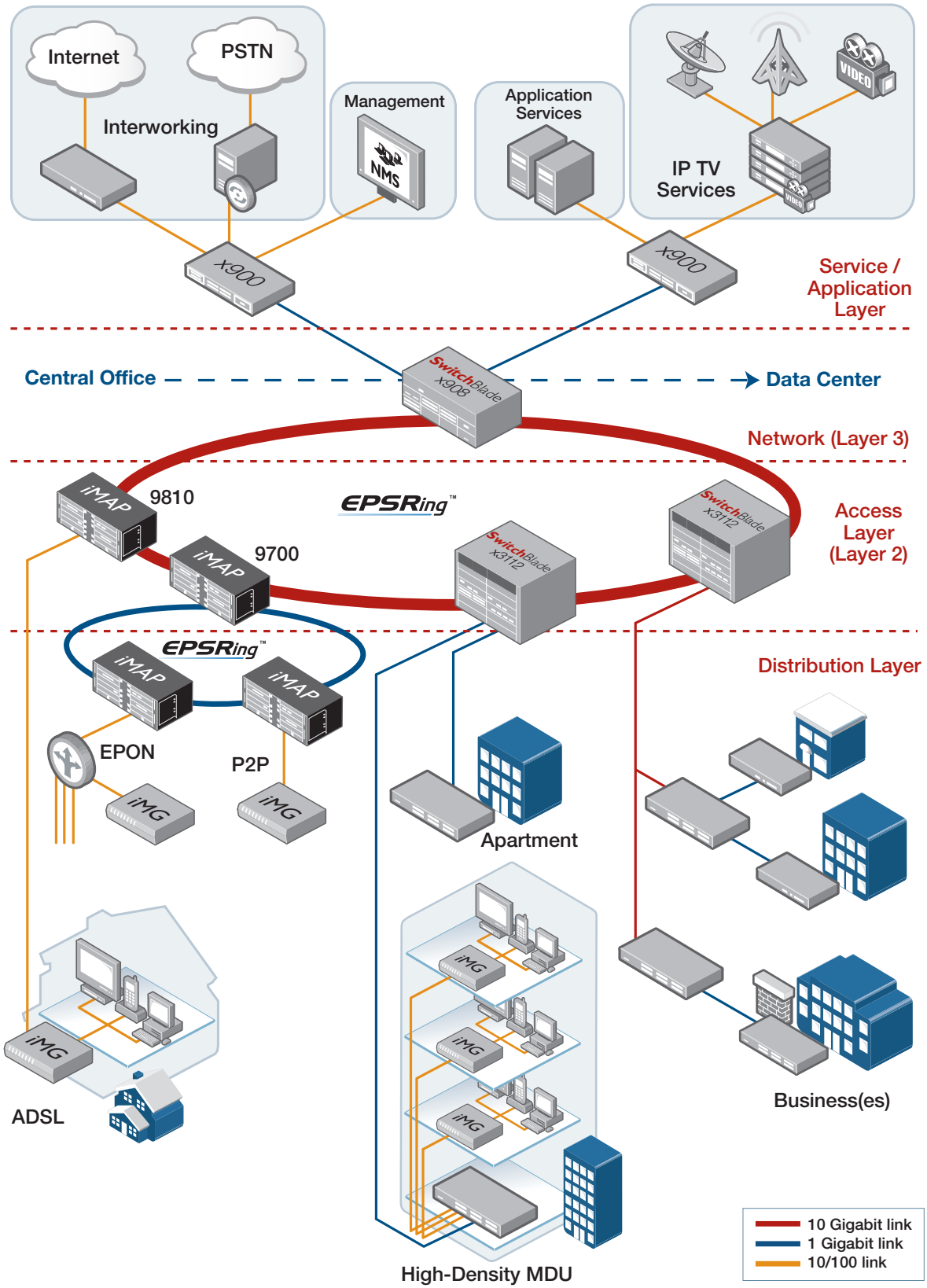
Securing the Network
- Supports three levels of security: User, Manager and Security Officer.

Secure Digital (SD) Card
- SD is used for file and log activities after the system has initialized.

Easy Setup
- A simple embedded web server allows commissioning of a system via an HTTP browser over the MGMT Ethernet port. Advanced configuration can then be easily performed using Allied Telesis AlliedView™ NMS.



Key Solutions



Specifications

System Capacity

AT-SBx31CFC (central fabric control card)
512MB DDR2 SDRAM
512KB NVRAM
128MB flash memory
32K MAC address
4K active VLANs
16Mbit packet buffer memory

AT-SBx31CFC960 (central fabric control card)
1GB DDR2 SDRAM
512KB NVRAM
128MB flash memory
32K MAC address
4K active VLANs
16Mbit packet buffer memory

AT-SBx31GP24 (24 x 10/100/1000T PoE+ line card)
128MB DDR2 SDRAM
16MB flash memory
16K MAC address
4K active VLANs
12Mbit packet buffer memory

AT-SBx31XZ4 (4 x 10Gbps (XFP) line card)
128MB DDR2 SDRAM
16MB flash memory
32K MAC address
4K active VLANs
16Mbit packet buffer memory

AT-SBx31XS6 (6 x 10G (SFP+) line card)
128MB DDR2 SDRAM
16MB flash memory
32K MAC address
4K active VLANs
16Mbit packet buffer memory

AT-SBx31GS24 (24 x 100/1000 SFP line card)
128MB DDR2 SDRAM
16MB flash memory
32K MAC address
4K active VLANs
16Mbit packet buffer memory

AT-SBx31GC40 (40 x 1G line card)
128MB DDR2 SDRAM
16MB flash memory
32K MAC address
4K active VLANs
16Mbit packet buffer memory

Maximum Bandwidth

Non-blocking for all packet sizes
Throughput: 595Mpps
Switch fabric: 800Gbps
Supports 10Kbytes jumbo packets

Wirespeed Switching on all Ethernet Ports

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

Latency

AT-SBx31GP24	**Latency (64 byte)**
1000Mbit	3060 ns
AT-SBx31XZ4	**Latency (64 byte)**
10Gbit	1880 ns
AT-SBx31XS6	**Latency (64 byte)**
10Gbit	2405 ns
AT-SBx31GS24	**Latency (64 byte)**
1000Mbit	2620 ns
AT-SBx31GC40	**Latency**
1000Mbit	2020 ns

Port Configurations

Auto-negotiation, duplex, MDI/MDI-X, IEEE 802.3x flow control/back pressure
Head of Line (HOL) blocking prevention

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 802.3ac VLAN TAG
IEEE 802.3u 100TX
IEEE 802.3x full-duplex operation
IEEE 802.3z Gigabit Ethernet
IEEE 802.3af Power over Ethernet class 3
IEEE 802.3at Power over Ethernet class 4
Jumbo frames (10Kbytes)

Spanning-Tree Protocol

IEEE 802.1D Spanning-Tree Protocol
IEEE 802.1w Rapid Spanning-Tree Protocol
IEEE 802.1s Multiple Spanning-Tree Protocol
BPDU cop

Resiliency

EPSR
EPSR SuperLoop
Bi-directional forwarding detection
Static Link Aggregation Groups (LAG)
Link Aggregation Control Protocol (LACP)
Layer 2 control plane prioritization
Hot-standby controller redundancy
System power redundancy
PoE+ power redundancy*

Multicast

RFC 1112 IGMP snooping v1
RFC 2236 IGMP snooping v2
Dynamic multicast router detection
Set-top box mobility control
Configurable unknown multicast flooding

Security

RADIUS client
TACACS+
User account management
SSHv2
BPDU protection
DHCP snooping
RFC 3042 DHCP relay
DHCP option 82 insertion
Auto IP filtering
ARP filtering
Local ARP discard
Access Control Lists (ACLs)
Password recovery

Convergence

Eight QoS queues per port
Policy-based QoS
DSCP - based (Layer 3) QoS
Configurable user priority-to-queue mapping
Egress port rate limiting
Egress queue rate limiting
Priority tagging (IEEE 802.1p for ingress)
Remarking
Strict priority queue servicing
IEEE 802.1ab Link Layer Discovery Protocol (LLDP)

Network Manageability

CLI interface
Command line help
RFC 854 Telnet server
Telnet client
Out-of-band Ethernet / IP management interface
In-band Ethernet / IP management interface
Login banner
RFC 1350 TFTP client
FTP client
RFC 1157 SNMPv1
RFC 1902-1904 SNMPv2c
Command scripting
Command aliases
Time and daylight savings time management
RFC 2030 SNTP client
Syslog
Log streaming
Log filtering
DNS client
Management interface ICMP support

MIB Support

RFC 1213 MIB-II
RFC 1573 MIB-II
RFC 2819 RMON MIB

Performance and Fault Management

RFC 1757 RMON groups 1,2,3,9
RMON threshold crossing alerts
User-defined packet counters
CPU utilization statistics
Alarm management
Configurable alarm security
Port outage alarm threshold
Thermal monitoring
Power-up diagnostics

Equipment Management

Profile management
Auto-provisioning
Pre-provisioning
PoE management

Layer 2 Switching and Control

FDB management
Configurable MAC removal modes
Port-based VLAN double tagging (Q-in-Q)
TPID editing
MAC address learning limits
Protocol tracing
Jumbo frames (Layer 2 forwarding)

VLAN

4K VLANs (IEEE 802.1Q)
VLAN management
Configurable VLAN ingress check
VLAN-based double tagging (Q-in-Q)
VLAN translation
Upstream Forwarding Only (UFO) VLANs
UFO Control Protocol (UCP)

System Administration

Software load management
Network booting
File management
Binary database backup / restore
Text config file backup / restore

Hardware

Redundant controller / fabric card
SD removable media supported only on AT-SBx31CFC
Redundant 1200W system power supply units
Load-sharing 1200W PoE power supply units
Fan tray

RoHS Standards

Compliant with European and China RoHS standards

Package Description

AT-SBx3112 chassis
Management cable (RJ-45 to DB-9)
Hardware kit accessories
Installation guide and CLI user's guide available at alliedtelesis.com/support/software

Physical Specifications

Product	Dimensions (W x D x H)
AT-SBx3112 chassis	48.03 cm x 38.79 cm x 31.01 cm (18.9 in x 15.27 in x 12.21 in)
AT-SBxPWRSYS1 AC system power supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBxPWRSYS2 AC system power supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBxPWRPOE1 AC PoE power supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBxPWRSYS1 DC system power supply	10.16 cm x 34.2 cm x 4.34 cm (4.00 in x 13.46 in x 1.71 in)
AT-SBxFAN12 tray module	2.74 cm x 33.35 cm x 26.04 cm (1.08 in x 13.13 in x 10.25 in)
All cards: AT-SBx31GT24 line card AT-SBx31GT40 line card AT-SBx31GP24 PoE line card AT-SBx31GS24 SFP line card AT-SBx31GC40 line card AT-SBx31XZ4 XFP line card AT-SBx31XS6 SFP+ line card AT-SBx31CFC960 controller fabric card	20.67 x 31.32 cm x 4.06 cm (8.14 in x 12.33 in x 1.6 in)

Product Weight

Product	Weight (kg / lbs)
AT-SBx3112 chassis	17.77 kg (39.10 lb)
AT-SBx31CFC central fabric control card	1.09 kg (2.40 lb)
AT-SBx31CFC960 central fabric control card	1.31 kg (2.50 lb)
AT-SBx31GP24 PoE line card	1.06 kg (2.34 lb)
AT-SBx31XS6	1.06 kg (2.34 lb)
AT-SBx31XZ4 XFP line card	1.06 kg (2.34 lb)
AT-SBx31GC40 line card	1.11 kg (2.45 lb)
AT-SBx31GS24 SFP line card	1.06 kg (2.34 lb)
AT-SBxPWRSYS1 system power supply	2.75 kg (6.05 lb)
AT-SBxPWRPOE1 power supply	2.73 kg (6.00 lb)
AT-SBxPWRSYS1-80 DC system power supply	1.9 kg (4.2 lb)
AT-SBx31FAN tray	1.82 kg (4.00 lb)

Power Specifications

AC voltage / frequency requirements	100-240V AC, 50/60 Hz
AT-SBxPWRSYS1	16A maximum @ 100V
AT-SBxPWRPOE1	16A maximum @ 100V
AT-SBxPWRSYS1-80	25A maximum @ -40vDC to -60vDC

Maximum power consumption

AT-SBx31GT24	34.4W
AT-SBx31CFC	48.3W
AT-SBx31CFC960	75W
AT-SBx31GP24	34.4W
AT-SBx31XZ4	48.3W
AT-SBx31XS6	54.8W
AT-SBx31GS24	56.3W
AT-SBx31GC40	64.0W

Heat dissipation

Line Card	BTU/hr
AT-SBx31GT24	146.72
AT-SBx31GP24	146.72
AT-SBx31GS24	240.13
AT-SBx31XZ4	206.01
AT-SBx31XS6	233.73
AT-SBx31CFC	206.01
AT-SBx31GC40	272.80
AT-SBx31CFC960	225.91

PSU heat dissipation

Line card	BTU/hr
AT-SBxPWRSYS1* (AC system PSU)	5118.21
AT-SBxPWR-POE* (PoE PSU)	5118.21
AT-SBxPWRSYS1-80* (DC system PSU)	4095

Power over Ethernet Specifications

Available Power over Ethernet	1200W @ 56vDC (using one PoE PSU)
IEEE 802.3at class 4 (30W/port)	Max 40 ports
IEEE 802.3af class 3 (15.4W/port)	Max 77 ports
IEEE 802.3af class 2 (7.0W/port)	Max 171 ports
IEEE 802.3af class 1 (4.0W/port)	Max 240 ports
Available Power over Ethernet	2400W @ 56vDC (using two PoE PSU)
IEEE 802.3at class 4 (30W/port)	Max 80 ports
IEEE 802.3af class 3 (15.4W/port)	Max 155 ports
IEEE 802.3af class 2 (7.0W/port)	Max 240 ports
IEEE 802.3af class 1 (4.0W/port)	Max 240 ports

IEEE 802.3at / IEEE 802.3af mode ► Alternative A (MDI)

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 m (9,843 ft)

Acoustic Noise

Acoustic noise: 75.7dB

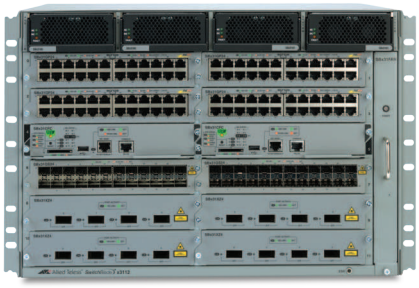
Acoustic noise measured at 40°C using the following products:

Product	Quantity
AT-SBx3112 chassis	1
AT-SBx31CFC central fabric control card	2
AT-SBx31GP24 PoE line card	5
AT-SBx31XZ4 XFP line card	5
AT-SBxPWRSYS1 system power supply	2
AT-SBxPWRPOE1 PoE power supply	2
AT-SBx31FAN tray	1

Safety and Electromagnetic Emissions Certifications

EMI/RFI	FCC Class A, EN55022 Class A, CISPR Class A, ICES 003 Class A
Immunity	EN55024
Electrical safety	EN60950-1 (TUV), UL60950-1 (CULUS), EN60825
Safety agency approvals	CULUS, TUV, C-TICK, CE

* Depends on PoE loading



Ordering Information

AT-SBx3112-96POE+
96-port chassis bundle
- 1 x AT-SBx3112 chassis
- 1 x AT-SBx31CFC fabric control card
- 4 x AT-SBx31GP24 PoE line card
- 1 x AT-SBxPWRSYS1 system power supply
- 1 x AT-SBxPWRPOE1 PoE power supply
- 1 x AT-SBx31FAN tray

AT-SBx3112-8XR
8 x 10G port, redundant starter bundle
- 1 x AT-SBx3112 chassis
- 2 x AT-SBx31CFC fabric control card
- 2 x AT-SBx31XZ4 XFP Ethernet line card
- 2 x AT-SBxPWRSYS1 system power supply
- 1 x AT-SBx31FAN tray

AT-SBx3112-12XS-80
Redundant controller DC power chassis bundle
- 1 x AT-SBx3112 chassis (empty chassis including fan)
- 2 x AT-SBx31CFC fabric control card (+ NSP firmware)
- 2 x AT-SBxPWRSYS1-80 DC system power supply (1200W)
- 2 x AT-SBx31XS6 line card (6-port 10G SFP+)

AT-SBx3112
Rack-mount 12-slot chassis with fan tray

AT-SBx31CFC
Central fabric control card

AT-SBx31CFC960
Central fabric control card

AT-SBx31GP24
24-port 10/100/1000T PoE Ethernet line card

AT-SBx31XZ4
4-port 10GE XFP Ethernet line card

AT-SBx31XS6
6-port 10GE SFP+ Ethernet line card

AT-SBx31GS24
24-port SFP Ethernet line card

AT-SBx31GC40
40-port CSFP Ethernet line card

AT-SBxPWRSYS1-xx
1200W AC system power supply

AT-SBxPWRSYS1-80
1200W DC system power supply

AT-SBxPWRPOE1-xx
1200W AC PoE power supply

AT-SBx31FAN
Contains four fans, temperature sensors and controller board

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

Power cords are only shipped with AT-SBxPWRSYS1-xx or AT-SBxPWRPOE1-xx power supplies.

Accessories

Small Form Pluggable Optics	Supported Platforms
AT-XPSR XFP, MMF, 10Gbps, 300 m, 850 nm, LC	AT-SBx31XZ4
AT-XPLR XFP, SMF, 10Gbps, 10 km, 1310 nm, LC	AT-SBx31XZ4
AT-XPER40 XFP, SMF, 10Gbps, 40 km, 1550 nm, LC	AT-SBx31XZ4
AT-XPER80 XFP, SMF, 10Gbps, 80 km, 1550 nm, LC	AT-SBx31XZ4
AT-SPSX SFP, MMF, 1000Mbps, 220 / 500 m, 850 nm, LC	AT-SBx31GS24
AT-SPEX SFP, MMF, 1000Mbps, 2 km, 1310 nm, LC	AT-SBx31GS24
AT-SPLX10 SFP, SMF, 1000Mbps, 10 km, 1310 nm, LC	AT-SBx31GS24
AT-SPLX40 SFP, SMF, 1000Mbps, 40 km, 1310 nm, LC	AT-SBx31GS24
AT-SPZX80 SFP, SMF, 1000Mbps, 80 km, 1550 nm, LC	AT-SBx31GS24
AT-SPBD10-13 SFP, SMF, 1000Mbps, 10 km, 1310/1490 nm, LC-BiDi	AT-SBx31GS24
AT-SPBD10-14 SFP, SMF, 1000Mbps, 10 km, 1490/1310 nm, LC-BiDi	AT-SBx31GS24
AT-SPBD20Dual-14 CSFP, SMF, 1000Mbps dual BiDi, 20 km, Tx1490/Rx1310, 2 x LC	AT-SBx31GC40
AT-SPBD40Dual-14 CSFP, SMF, 1000Mbps dual BiDi, 40km, Tx1490/Rx1310, 2 x LC	AT-SBx31GC40
AT-SPFX/2 SFP, MMF, 100Mbps, 2 km, 1310 nm, LC	AT-SBx31GS24
AT-SPFXBD-LC-13 SFP, SMF, 100Mbps, 10 km, 1310/1510 nm, LC-BiDi	AT-SBx31GS24
AT-SPFXBD-LC-15 SFP, SMF, 100Mbps, 10 km, 1510/1310 nm, LC-BiDi	AT-SBx31GS24
AT-SPFX/15 SFP, SMF, 100Mbps, 15 km, 1310 nm, LC	AT-SBx31GS24
AT-SP10SR SFP+ 10G, 300M, 850 nm, C temp	AT-SBx31XS6
AT-SP10LR SFP+ 10G, 10Km, 1310 nm, C temp	AT-SBx31XS6
AT-SP10TW1 SFP+ Twinax, 10G, 1 meter, copper C temp	AT-SBx31XS6
AT-SP10TW-3 SFP+ Twinax, 10G, 3 meter, copper, C temp	AT-SBx31XS6
AT-SP10TW-7 SFP+ Twinax, 10G, 7 meter, copper, C temp	AT-SBx31XS6

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