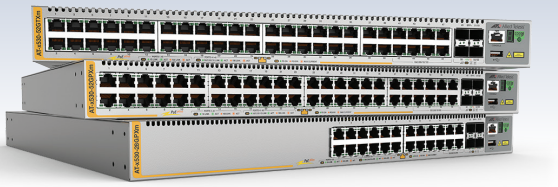
x530 Series

Stackable Multi-Gigabit Layer 3 Switches



The Allied Telesis x530 Series of stackable Multi-Gigabit Layer 3 switches feature high capacity, resiliency and easy management, making them the ideal choice for demanding distribution and high-speed connectivity applications.

Overview

Allied Telesis x530 Series switches are a high-performing and feature-rich choice for today's networks. They offer a versatile solution for enterprise applications. With 20 or 40 x 10M/100M/1Gigabit ports, 4 or 8 x 100M/1/2.5/5 Gigabit ports, and 10 Gigabit uplinks, plus the power of Allied Telesis Virtual Chassis Stacking (VCStack™), the x530 Series can connect anything from a small workgroup to a large business.

Network automation

Vista Manager™ EX bundled with Allied Telesis Autonomous Management Framework™ (AMF) meets the increasing management requirements of modern networks. While AMF allows an entire network to be securely and easily managed as a single virtual device, Vista Manager EX provides an intuitive and powerful graphical tool for monitoring and managing AMF wired and Autonomous Wave Control (AWC) wireless devices.

Device and network management

The Device GUI on the x530 Series enables graphical monitoring of key switch features to support easy management.

Integrated into the Device GUI, Vista Manager™ mini supports visibility and management of AMF wired and AWC wireless network devices, making it ideal as a one-stop solution for small to medium-sized networks.

AWC is an intelligent, easy to use Wireless LAN controller that automatically maintains optimal wireless coverage. Vista Manager mini includes AWC floor and heat maps showing wireless coverage. It also supports AWC Channel Blanket hybrid operation, providing maximum performance and seamless roaming, as well as AWC Smart Connect for simplified deployment, and a resilient Wi-Fi network solution using wireless uplink connectivity.

Resilient

Allied Telesis Ethernet Protection Switched Ring (EPSRing™) and the standards-based G.8032 Ethernet Ring Protection, ensure that distributed network segments have high-speed, resilient access to online resources and applications.

x530 Series can form a VCStack of up to eight units. In conjunction with link aggregation, VCStack provides an enhanced resiliency with no single point of failure to meet today's increasing demand for high-available networks with minimal downtime.

With Long Distance Stacking (VCStack LD), it allows stacks to be created over fibre links, making the x530 Series the perfect choice for distributed environment.

Secure

A secure network environment is guaranteed. The x530 Series offers powerful control over network traffic types, secure management options, loop guard to protect against cabling mistakes, and tri-authentication for comprehensive access control.

Future proof

The x530 Series ensures a future-proof network, with superior flexibility and the ability to stack multiple units. All x530 Series models feature 10 Gigabit uplink ports and a comprehensive IPv6 feature set, to ensure they are ready for future network traffic demands.

High-speed wireless

The x530 Series provides support for both 2.5 and 5 Gigabit connectivity, allowing high-speed wireless (802.11ac or "Wave2") to run at full capacity while avoiding the need to upgrade existing Cat5e and Cat6/6A cables.

Environmentally friendly

The x530 Series support Energy Efficient Ethernet (EEE), automatically reducing the power consumed by the switch whenever there is no traffic on a port. This sophisticated feature significantly lowers operating costs by reducing the power requirements of the switch and any associated cooling equipment.

Key Features

- Allied Telesis Autonomous Management Framework™ (AMF)
- VCStack™ up to 8 switches
- VCStack LD for long distance stacking
- Multi-Gigabit Ethernet ports for 1G/2.5G/5G
- 2.5G for high-speed wireless APs
- EPSR™ and G.8032 ERPS for resilient rings
- OpenFlow for SDN
- Active Fiber Monitoring (AFM)
- Upstream Forwarding Only (UFO)
- VLAN Translation
- Device GUI for web-based management
- AT-Vista Manager mini enables:
  - Wired and wireless network visibility
  - AWC wireless network management
  - AWC-Channel Blanket hybrid wireless
  - AWC-Smart Connect wireless uplinks

Key Features

Vista Manager mini

- Integrated into the Device GUI, Vista Manager mini provides full network visibility of AMF wired and AWC wireless devices. Manage and simplify wireless deployment with AWC-Smart Connect, and support optimal wireless performance from AWC hybrid operation with maximum throughout and a seamless Wi-Fi user experience.

Allied Telesis Autonomous Management Framework™ (AMF)

- AMF is a sophisticated suite of management tools that provide a simplified approach to zero-touch network management.
- Any x530 Series can operate as the AMF network master, storing firmware and configuration backups for other network nodes. The AMF master enables auto-provisioning and auto-upgrade by providing appropriate files to new network members. New network devices can be pre-provisioned, making installation easy because no onsite configuration is required.
- AMF Guestnode allows Allied Telesis wireless APs and other switching products, as well as third-party devices such as IP phones and security cameras, to be part of an AMF network.

AWC Wireless Management

- Optimize wireless network performance with the Autonomous Wave Controller (AWC), built-in to the x530 Series. AWC analyzes wireless traffic patterns and automatically reconfigures access points to meet demand.
- Wireless network operation in multi-channel, single-channel (Channel Blanket), and hybrid (multi-channel and Channel Blanket) modes, supports maximum data throughput and seamless roaming for the most flexible wireless solution available.
- AWC-Smart Connect (AWC-SC) enables plug-and play wireless network growth, as new APs only need a power connection, and will then automatically create resilient wireless uplink connections to other APs.

Virtual Chassis Stacking (VCStack™)

- The x530 Series supports VCStack up to 8 units with 40Gbps bandwidth for each unit. VCStack, in conjunction with link aggregation, provides a high available system where network resources are spread out across stacked units, providing excellent resiliency.

Long-Distance Stacking (VCStack LD)

- VCStack LD allows a VCStack to be created over longer distances, perfect for distributed network environments.

Ethernet Protection Switched Ring (EPSRing™)

- EPSRing and 10 Gigabit Ethernet allow several x530 Series switches to form high-speed protected rings capable of recovery within as little as 50ms. This feature is perfect for high performance and high availability in enterprise networks.
- Super-Loop Protection (SLP) enables a link between two EPSR nodes to be in separate EPSR domains, improving redundancy and network fault resiliency.
- The x530 Series switches can act as the ESPR Master, or be deployed as EPSR transit nodes, in a high-speed ring.

G.8032 Ethernet Ring Protection

- G.8032 provides standards-based high-speed ring protection, that also interoperate with Allied Telesis EPSR.
- Ethernet Connectivity Fault Monitoring (CFM) proactively monitors links and VLANs, and provides alerts when a fault is detected.

Multi-Gigabit Ethernet

- The new IEEE 802.3bz standard (also known as "NBASE-T") allows traffic speeds of greater than 1 Gigabit on legacy Cat5e cable. The x530 Series supports both 2.5 and 5 Gigabit connectivity allowing high-speed wireless access points to run at full capacity without re-cabling.

Power over Ethernet Plus (PoE+)

- With PoE, a separate power connection to media endpoints such as IP phones and wireless access points is not necessary. PoE+ reduces costs and provides even greater flexibility, providing the capability to connect devices requiring more power (up to 30 Watts) such as pan, tilt and zoom security cameras.
- The x530 Series allows the configuration of the overall power budget, as well as the power limit per port.

Active Fiber Monitoring (AFM)

- AFM prevents eavesdropping on fiber communications by monitoring received optical power. If an intrusion is detected, the link can be automatically shut down, or an operator alert can be sent.

Continuous PoE

- Continuous PoE allows the switch to be restarted without affecting the supply of power to connected devices. Smart lighting, security cameras, and other PoE devices will continue to operate during a software upgrade on the switch.

Virtual Routing and Forwarding (VRF Lite)

- VRF Lite provides Layer 3 network virtualization by dividing a single switch into multiple independent virtual routing domains. With independent routing domains, IP addresses can overlap without causing conflict, allowing multiple customers to have their own secure virtual network within the same physical infrastructure. VRF Lite on the x530 Series supports both unicast and multicast traffic.

High Reliability

- The x530 Series feature front to back cooling and dual fixed internal PSUs.

sFlow

- sFlow is an industry-standard technology for real-time monitoring high-speed switched networks. It provides complete visibility into network use, enabling performance optimization, usage accounting/billing, and defense against security threats.

VLAN Mirroring (RSPAN)

- VLAN mirroring allows traffic from a port on a remote switch to be analyzed locally. Traffic being transmitted or received on the port is duplicated and sent across the network on a special VLAN.

Optical DDM

- Most modern optical SFP/SFP+/QSFP transceivers support Digital Diagnostics Monitoring (DDM). This enables real time monitoring of various parameters of the transceiver, such as optical output power, temperature, laser bias current and transceiver supply voltage. Easy access to this information simplifies diagnosing problems with optical modules and fiber connections.

Premium Software License

- By default, the x530 Series offers a comprehensive Layer 2 and basic Layer 3 feature set that includes static routing and IPv6 management features. The feature set can easily be elevated to full Layer 3 by applying the premium software license. This adds dynamic routing protocols and Layer 3 multicasting capabilities.

Dynamic Host Configuration Protocol (DHCP) Snooping

- DHCP servers allocate IP addresses to clients, and the switch keeps a record of addresses issued on each port. IP source guard checks against this DHCP snooping database to ensure only clients with specific IP and/or MAC address can access the network. DHCP snooping can be combined with other features, like dynamic ARP inspection, to increase security in Layer 2 switched environments, and also provides a traceable history, which meets the growing legal requirements placed on service providers.

Upstream Forwarding Only (UFO)

- UFO lets you manage which ports in a VLAN can communicate with each other, and which only have upstream access to services, for secure multi-user deployment.

VLAN Translation

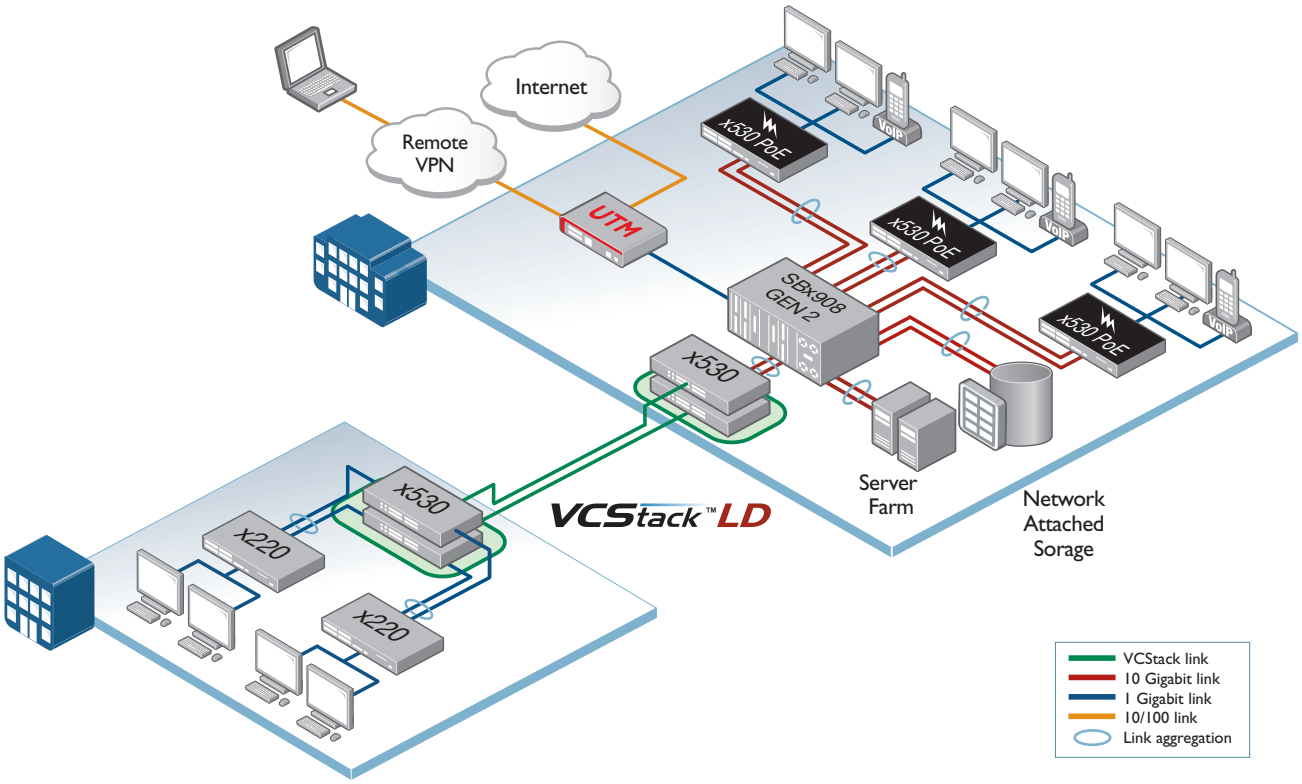
- VLAN Translation allows traffic arriving on a VLAN to be mapped to a different VLAN on the outgoing paired interface.
- It is common for a network Service Provider (SP) to give each customer their own unique VLAN, yet at the customer location give all customers the same VLAN-ID for tagged packets to use on the wire. SPs can use VLAN Translation to change the tagged packet's VLAN-ID at the customer location to the VLAN-ID for tagged packets to use within the SP's network.
- This feature is also useful in Enterprise environments where it can be used to merge two networks together, without manually reconfiguring the VLAN numbering scheme.

Software Defined Networking (SDN)

- OpenFlow is a key technology that enables the use of SDN to build smart applications that unlock value and reduce cost.

Key Solutions

Distribution and Edge Connectivity



Resilient distributed switching

Allied Telesis x530 Series switches are ideal for distribution solutions, where resiliency and flexibility are required. In the above diagram, distribution switches utilize long distance VCStack LD to create a single virtual unit out of multiple devices. By using fiber stacking connectivity, units can be kilometers apart—perfect for a distributed environment.

When combined with link aggregation, VCStack provides a solution with no single point of failure that fully utilizes all network bandwidth.

Allied Telesis x530 Series switches support Enterprises and their use of business-critical online resources and applications, with a resilient and reliable distributed solution.

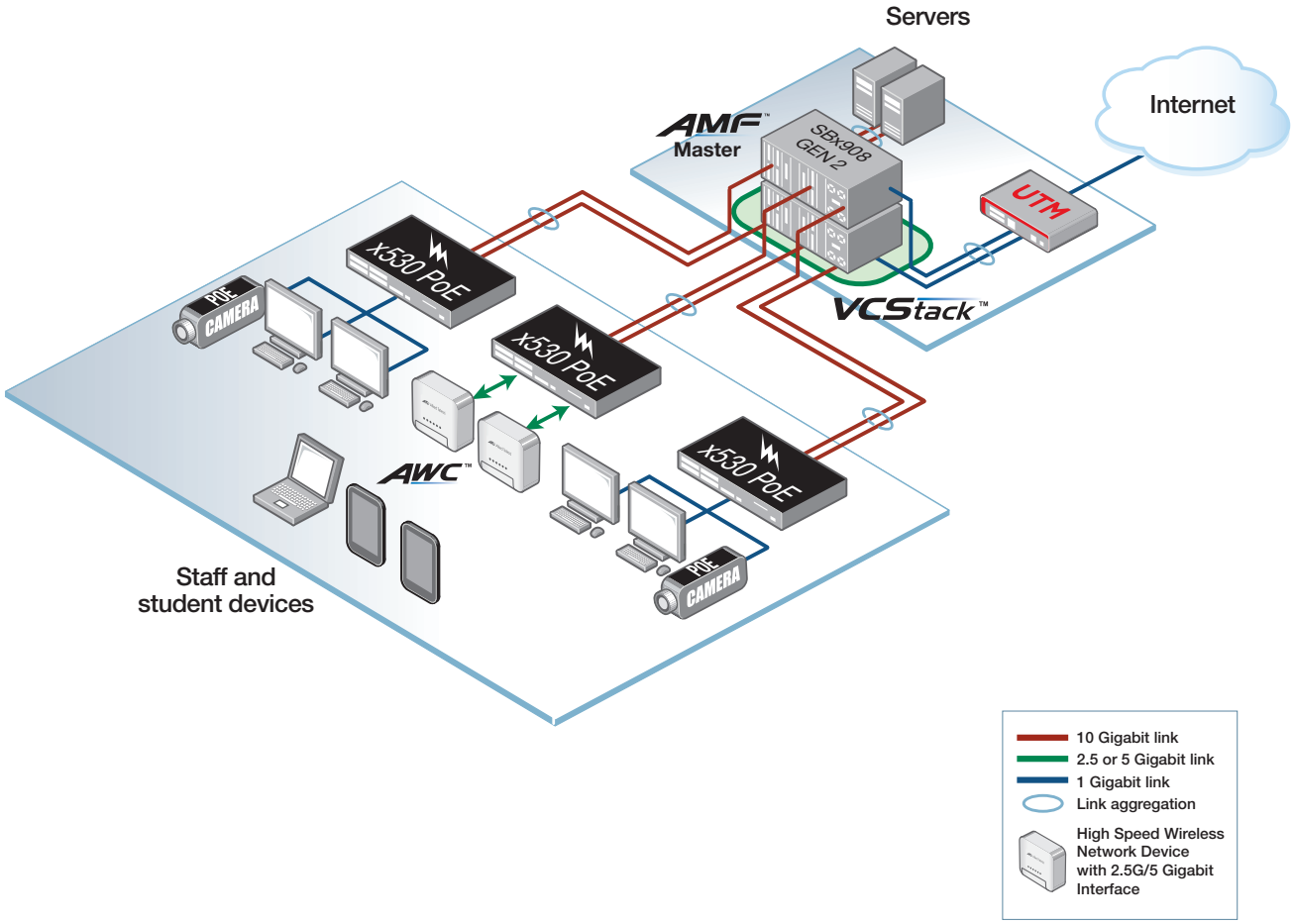
Peace of mind at the network edge

Allied Telesis x530 Series switches are the ideal choice for the network edge where security, resiliency and flexibility are required. In the above diagram, security is enforced using Network Access Control (NAC) combined with tri-authentication to prevent unauthorized users and devices from connecting to the network. Link aggregation is used to provide resiliency back to the core chassis, and to increase available bandwidth over a single link.

With 740 Watts of PoE power available, the x530 can provide the full 30 Watts of PoE+ on up to 24 ports, to connect and power a wide range of devices.

Key Solutions

Multi-Gigabit Connectivity



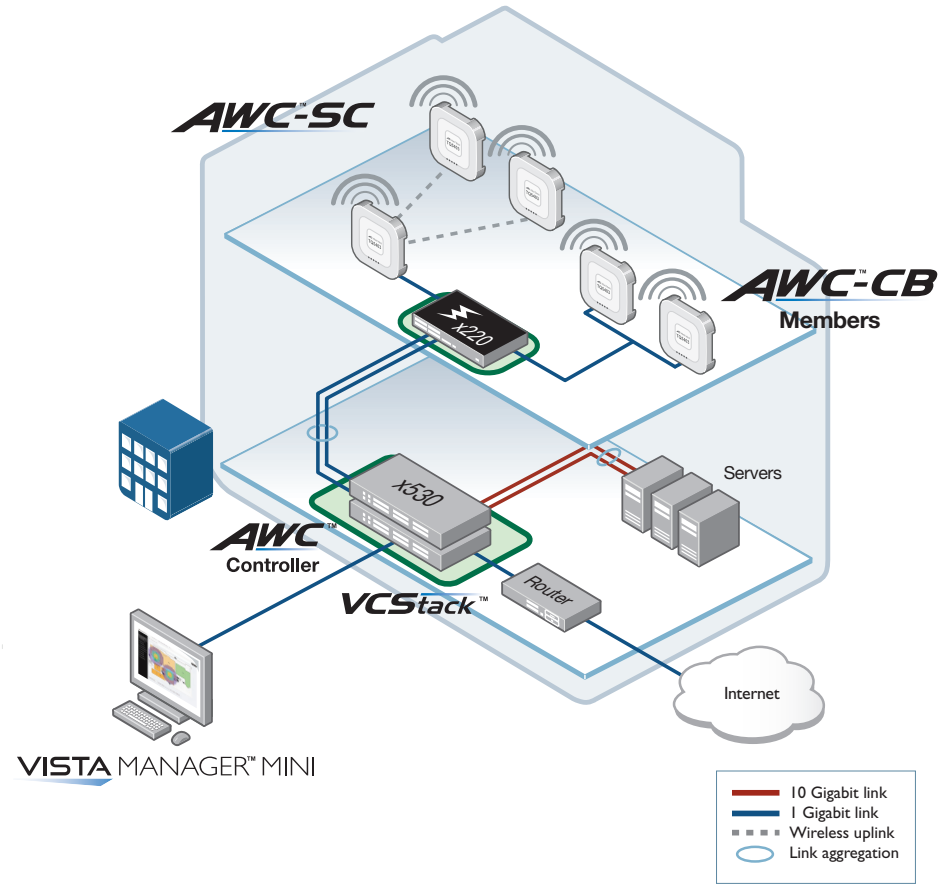
2.5/5G Multi-Gigabit connectivity

The x530 Series feature 4 or 8 Multi-Gigabit ports which enable higher speed connectivity at 2.5 or 5Gbps.

This supports new applications such as Wave 2 wireless access points to maximize data throughout and remove bottlenecks, increasing the effectiveness of the WiFi network. It also enables network backbone upgrades from 1 to 5 Gbps without the need to replace existing Cat5e and Cat6/6A cables.

Key Solutions

Integrated wireless LAN management



Allied Telesis Autonomous Wave Controller (AWC) offers solutions for two of the most common problems with Wireless LANs: initial setup complexity and on-going performance degradation. Initial WLAN set-up usually requires a site survey to achieve the best coverage; and performance of WLANs can often change over time as external sources of radio interference reduce coverage and bandwidth. These issues can be time-consuming to identify and resolve.

AWC features an intelligent process that automatically re-calibrates the signal strength and radio channel of each Access Point (AP) for optimal WLAN performance.

AWC Smart Connect (AWC-SC) uses wireless uplink connections between APs, so deployment is as easy as plugging in and powering on the new APs, which automatically extend the Wi-Fi network, creating a resilient solution.

Vista Manager mini is integrated into the Device GUI of the x530 Series and provides an ideal solution for modern enterprise networks, enabling management of both the wired (with AMF) and wireless (with AWC) networks to be automated. This reduces both the time and cost of network administration, as well as maximizing network performance for a superior user experience.

Up to 5 TQ Series wireless APs can be managed for free, and up to a further 40 APs (max 45) with feature licenses, available separately.

On some AP models, hybrid channel blanket enables multi-channel and single-channel WiFi operation simultaneously. This supports seamless roaming and maximum throughput. Channel Blanket licenses are available for up to 40 APs. For plug-and-play wireless deployment AWC-SC licenses are available for up to 40 APs.

Specifications

PRODUCT	10/100/1000T (RJ-45) COPPER PORTS	100M/1/2.5/5 GIGABIT PORTS	1/10 GIGABIT SFP+ PORTS	STACKING PORTS	POE+ ENABLED PORTS	SWITCHING FABRIC	FORWARDING RATE
x530-28GTXm	20	4	4	2*	-	160Gbps	119 Mpps
x530-28GPXm	20	4	4	2*	24	160Gbps	119 Mpps
x530-52GTXm	40	8	4	2*	-	240Gbps	179Mpps
x530-52GPXm	40	8	4	2*	48	240Gbps	179Mpps

* Stacking ports can be configured as additional 1G/10G Ethernet ports when the switch is not stacked

Performance
- 40Gbps of stacking bandwidth using front panel 10G SFP+ ports
- Supports 10KB jumbo frames
- 4094 configurable VLANs
- Up to 16K MAC addresses
- Up to 128 Link Aggregation Groups (LAGS) - any combination of static and dynamic (LACP)
- 1GB DDR3 SDRAM, 256MB NAND flash memory
- Packet buffer memory: 1.5MB

Reliability
- Modular AlliedWare Plus operating system
- Internal dual fixed PSUs, providing uninterrupted power and extra reliability
- Full environmental monitoring of PSUs, fans, temperature and internal voltages. SNMP traps alert network managers in case of any failure

Expandability
- Stack up to eight units in a VCStack
- Versatile licensing options for additional features

Flexibility and Compatibility
- 10G SFP+ ports will support any combination of Allied Telesis 1000Mbps SFP and 10GbE SFP+ modules and direct attach cables listed in this document under Ordering Information
- Port speed and duplex configuration can be set manually or by auto-negotiation
- Front-panel SFP+ stacking ports can be configured as 1G/10G Ethernet ports

Diagnostic Tools
- Connectivity Fault Management (CFM) - Continuity Check Protocol (CCP) for use with G.8032 ERPS
- Built-In Self Test (BIST)
- Ping polling and TraceRoute for IPv4 and IPv6
- Optical Digital Diagnostic Monitoring (DDM)
- Find-me device locator
- Automatic link flap detection and port shutdown
- Cable fault locator (TDR)
- Uni-Directional Link Detection (UDLD)
- Active Fiber Monitoring detects tampering on optical links
- Port and VLAN mirroring (RSPAN)

IPv4 Features
- Equal Cost Multi Path (ECMP) routing
- Static unicast and multicast routing for IPv4
- UDP broadcast helper (IP helper)
- Directed broadcast forwarding
- Black hole routing
- DNS relay
- Policy-based routing
- Route redistribution (OSPF, RIP, and BGP)
- Virtual Routing and Forwarding Lite (VRF-Lite) up to 64 domains

IPv6 Features
- Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
- IPv4 and IPv6 dual stack
- IPv6 over IPv4 tunneling (manual configuration only)
- Log to IPv6 hosts with Syslog v6
- NTPv6 client and server
- DNSv6 client, DNSv6 relay
- DHCPv6 relay and client
- Static IPv6 unicast and multicast routing
- IPv6 aware storm protection and QoS
- IPv6 hardware ACLs

Management
- Industry-standard CLI with context-sensitive help
- Built-in text editor and powerful CLI scripting engine
- Comprehensive SNMP MIB support for standards-based device management
- Console management port on the front panel for ease of access
- Event-based triggers allow user-defined scripts to be executed upon selected system events
- Eco-friendly mode allows ports and LEDs to be disabled to save power
- USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices
- Front panel 7-segment LED provides at-a-glance status and fault information
- Autonomous Management Framework (AMF) enables powerful centralized management and zero-touch device installation and recovery. Try AMF for free with the built-in Starter license
- Web-based Graphical User Interface (GUI)

Quality of Service
- IP precedence and DiffServ marking based on Layer 2, 3 and 4 headers
- Queue scheduling options for strict priority, weighted round robin or mixed scheduling
- Taildrop for queue congestion control
- Extensive remarking capabilities
- Policy-based QoS based on VLAN, port, MAC and general packet classifiers
- Limit bandwidth per port or per traffic class down to 64kbps
- 8 priority queues with a hierarchy of high priority queues for real time traffic, and mixed scheduling, for each switch port
- Policy-based storm protection
- Wirespeed traffic classification with low latency essential for VoIP and real-time streaming media applications

Resiliency Features
- EPSRing (Ethernet Protection Switched Rings) with SuperLoop Protection (SLP) and enhanced recovery
- EPSR Master or transit node deployment
- STP root guard
- Loop protection: thrash limiting and loop detection
- Dynamic link failover (host attach)
- Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
- PVST+ compatibility mode
- VCStack fast failover minimizes network disruption
- SFP+ stacking ports can be configured as 10G Ethernet ports
- Long-Distance VCStack with 10G SFP+ modules (VCStack-LD)
- BPDU forwarding

Security Features
- MAC address filtering and MAC address lock-down
- Port-based learn limits (intrusion detection)
- Access Control Lists (ACLs) based on layer 3 and 4 headers
- Private VLANs provide security and port isolation for multiple customers using the same VLAN
- Secure Copy (SCP)
- BPDU protection
- Network Access and Control (NAC) features manage endpoint security
- Dynamic VLAN assignment
- Tri-authentication: MAC-based, web-based and IEEE 802.1x
- DoS attack blocking and virus throttling
- DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)
- Strong password security and encryption
- Auth fail and guest VLANs
- Secure File Transfer Protocol (SFTP) client
- Authentication, Authorisation and Accounting (AAA)
- Bootloader can be password protected for device security
- Configurable ACLs for management traffic
- RADIUS group selection per VLAN or port
- RADIUS Proxy

Environmental Specifications

- Operating temperature range: 0°C to 50°C (32°F to 122°F)
- Storage temperature range: -25°C to 70°C (-13°F to 158°F)
- Operating relative humidity range: 5% to 90% non-condensing
- Storage relative humidity range: 5% to 95% non-condensing
- Operating altitude: 3,048 meters maximum (10,000 ft)

Software Defined Networking (SDN)

- OpenFlow v1.3 with support for encryption, connection interruption and inactivity probe

Electrical Approvals and Compliances

- EMC: EN55032 class A, FCC class A, VCCI class A, ICES-003 class A
- Immunity: EN55024, EN61000-3-levels 2 (Harmonics), and 3 (Flicker) – AC models only

Safety

- Standards: UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN60950-1, EN60825-1, AS/NZS 60950.1
- Certification: UL, cUL

Restrictions on Hazardous Substances (RoHS) Compliance

- EU RoHS compliant
- China RoHS compliant

Physical Specifications

PRODUCT	WIDTH X DEPTH X HEIGHT	MOUNTING	WEIGHT		PACKAGED DIMENSIONS
			UNPACKAGED	PACKAGED	
x530-28GTXm	441 x 323 x 44 mm (17.36 x 12.72 x 1.73 in)	Rack-mount	4.8 kg (10.58 lb)	6.8 kg (14.99 lb)	563 x 534 x 128 mm (22.16 x 21.02 x 5.04 in)
x530-28GPXm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.3 kg (13.90 lb)	8.3 kg (18.29 lb)	563 x 534 x 128 mm (22.16 x 21.02 x 5.04 in)
x530-52GTXm	441 x 323 x 44 mm (17.36 x 12.72 x 1.73 in)	Rack-mount	5.3 kg (11.60 lb)	7.3 kg (16.00lb)	563 x 534 x 128 mm (22.16 x 21.02 x 5.04 in)
x530-52GPXm	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.9 kg(15.20 lb)	8.9 kg(19.60 lb)	563 x 632 x 128 mm (22.16 x 24.88 x 5.04 in)

Power and Noise Characteristics

PRODUCT	NO POE LOAD			FULL POE+ LOAD			MAX POE POWER (W)	POE SOURCING PORTS		
	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/H)	NOISE (DBA)	MAX POWER CONSUMPTION (W)	MAX HEAT DISSIPATION (BTU/H)	NOISE (DBA)		POE (7.5W)	POE (15.4W)	POE (30W)
x530-28GTXm	55	188	42	-	-	-	-	-	-	-
x530-28GPXm	77	264	44	900	614	44	740	24	24	24
x530-52GTXm	85	290	TBD	-	-	-	-	-	-	-
x530-52GPXm	88	300	TBD	970	661	TBD	740	48	48	24

Noise: tested to ISO7779; front bystander position

Latency (microseconds)

PRODUCT	PORT SPEED		
	100MBPS	1GBPS	10GBPS
x530-28GTXm	7.38µs	4.05µs	1.63µs
x530-28GPXm	7.38µs	4.05µs	1.63µs
x530-52GTXm	7.42µs	4.10µs	1.68µs
x530-52GPXm	7.42µs	4.10µs	1.68µs

Standards and Protocols

AlliedWare Plus Operating System

Version 5.5.0

Authentication

RFC 1321 MD5 Message-Digest algorithm
RFC 1828 IP authentication using keyed MD5

Border Gateway Protocol (BGP)

BGP dynamic capability
BGP outbound route filtering
RFC 1772 Application of the Border Gateway Protocol (BGP) in the Internet
RFC 1997 BGP communities attribute
RFC 2385 Protection of BGP sessions via the TCP MD5 signature option
RFC 2439 BGP route flap damping
RFC 2545 Use of BGP-4 multiprotocol extensions for IPv6 inter-domain routing
RFC 2858 Multiprotocol extensions for BGP-4
RFC 2918 Route refresh capability for BGP-4
RFC 3392 Capabilities advertisement with BGP-4
RFC 3882 Configuring BGP to block Denial-of-Service (DoS) attacks
RFC 4271 Border Gateway Protocol 4 (BGP-4)
RFC 4360 BGP extended communities
RFC 4456 BGP route reflection - an alternative to full mesh iBGP
RFC 4724 BGP graceful restart
RFC 4893 BGP support for four-octet AS number space
RFC 5065 Autonomous system confederations for BGP

Cryptographic Algorithms

FIPS Approved Algorithms

Encryption (Block Ciphers):

- AES (ECB, CBC, CFB and OFB Modes)
- 3DES (ECB, CBC, CFB and OFB Modes)

Block Cipher Modes:

- CCM
- CMAC
- GCM
- XTS

Digital Signatures & Asymmetric Key Generation:

- DSA
- ECDSA
- RSA

Secure Hashing:

- SHA-1
- SHA-2 (SHA-224, SHA-256, SHA-384. SHA-512)

Message Authentication:

- HMAC (SHA-1, SHA-2(224, 256, 384, 512)

Random Number Generation:

- DRBG (Hash, HMAC and Counter)

Non FIPS Approved Algorithms

RNG (AES128/192/256)
DES
MD5

Encryption (management traffic only)

FIPS 180-1 Secure Hash standard (SHA-1)
FIPS 186 Digital signature standard (RSA)
FIPS 46-3 Data Encryption Standard (DES and 3DES)

Ethernet Standards

IEEE 802.2 Logical Link Control (LLC)
IEEE 802.3 Ethernet
IEEE 802.3ab1000BASE-T
IEEE 802.3ae10 Gigabit Ethernet
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet up to 30W (PoE+)
IEEE 802.3azEnergy Efficient Ethernet (EEE)
IEEE 802.3bz2.5GBASE-T and 5GBASE-T ("multi-gigabit")
IEEE 802.3u 100BASE-X
IEEE 802.3x Flow control - full-duplex operation
IEEE 802.3z 1000BASE-X

IPv4 Features

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 919 Broadcasting Internet datagrams
RFC 922 Broadcasting Internet datagrams in the presence of subnets
RFC 932 Subnetwork addressing scheme
RFC 950 Internet standard subnetting procedure
RFC 951 Bootstrap Protocol (BootP)
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 1518 An architecture for IP address allocation with CIDR
RFC 1519 Classless Inter-Domain Routing (CIDR)
RFC 1542 Clarifications and extensions for BootP
RFC 1591 Domain Name System (DNS)
RFC 1812 Requirements for IPv4 routers
RFC 1918 IP addressing
RFC 2581 TCP congestion control

IPv6 Features

RFC 1981 Path MTU discovery for IPv6
RFC 2460 IPv6 specification
RFC 2464 Transmission of IPv6 packets over Ethernet networks
RFC 2711 IPv6 router alert option
RFC 3484 Default address selection for IPv6
RFC 3587 IPv6 global unicast address format
RFC 3596 DNS extensions to support IPv6
RFC 4007 IPv6 scoped address architecture
RFC 4193 Unique local IPv6 unicast addresses
RFC 4213 Transition mechanisms for IPv6 hosts and routers
RFC 4291 IPv6 addressing architecture
RFC 4443 Internet Control Message Protocol (ICMPv6)
RFC 4861 Neighbor discovery for IPv6
RFC 4862 IPv6 Stateless Address Auto-Configuration (SLAAC)
RFC 5014 IPv6 socket API for source address selection
RFC 5095 Deprecation of type 0 routing headers in IPv6
RFC 5175 IPv6 Router Advertisement (RA) flags option
RFC 6105 IPv6 Router Advertisement (RA) guard

Management

AT Enterprise MIB including AMF MIB and SNMP traps
Optical DDM MIB
SNMPv1, v2c and v3
IEEE 802.1ABLink Layer Discovery Protocol (LLDP)
RFC 1155 Structure and identification of management information for TCP/IP-based Internets
RFC 1157 Simple Network Management Protocol (SNMP)
RFC 1212 Concise MIB definitions
RFC 1213 MIB for network management of TCP/IP-based Internets: MIB-II
RFC 1215 Convention for defining traps for use with the SNMP
RFC 1227 SNMP MUX protocol and MIB
RFC 1239 Standard MIB
RFC 1724 RIPv2 MIB extension
RFC 2578 Structure of Management Information v2 (SMIv2)
RFC 2579 Textual conventions for SMIv2
RFC 2580 Conformance statements for SMIv2
RFC 2674 Definitions of managed objects for bridges with traffic classes, multicast filtering and VLAN extensions
RFC 2741 Agent extensibility (AgentX) protocol
RFC 2787 Definitions of managed objects for VRRP
RFC 2819 RMON MIB (groups 1,2,3 and 9)
RFC 2863 Interfaces group MIB
RFC 3176 sFlow: a method for monitoring traffic in switched and routed networks
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 SNMP
RFC 3416 Version 2 of the protocol operations for the SNMP
RFC 3417 Transport mappings for the SNMP
RFC 3418 MIB for SNMP
RFC 3621 Power over Ethernet (PoE) MIB
RFC 3635 Definitions of managed objects for the Ethernet-like interface types
RFC 3636 IEEE 802.3 MAU MIB
RFC 4022 MIB for the Transmission Control Protocol (TCP)
RFC 4113 MIB for the User Datagram Protocol (UDP)
RFC 4188 Definitions of managed objects for bridges
RFC 4292 IP forwarding table MIB
RFC 4293 MIB for the Internet Protocol (IP)
RFC 4318 Definitions of managed objects for bridges with RSTP
RFC 4502 RMON 2
RFC 4560 Definitions of managed objects for remote ping, traceroute and lookup operations
RFC 5424 The Syslog protocol
RFC 6527 Definitions of managed objects for VRRPv3

Multicast Support

Bootstrap Router (BSR) mechanism for PIM-SM
IGMP query solicitation
IGMP snooping (IGMPv1, v2 and v3)
IGMP snooping fast-leave
IGMP/MLD multicast forwarding (IGMP/MLD proxy)
MLD snooping (MLDv1 and v2)
PIM and PIM SSM for IPv6
RFC 1112 Host extensions for IP multicasting (IGMPv1)
RFC 2236 Internet Group Management Protocol v2 (IGMPv2)
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2715 Interoperability rules for multicast routing protocols
RFC 3306 Unicast-prefix-based IPv6 multicast addresses
RFC 3376 IGMPv3
RFC 3810 Multicast Listener Discovery v2 (MLDv2) for IPv6
RFC 3956 Embedding the Rendezvous Point (RP) address in an IPv6 multicast address
RFC 3973 PIM Dense Mode (DM)
RFC 4541 IGMP and MLD snooping switches
RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM): protocol specification (revised)
RFC 4604 Using IGMPv3 and MLDv2 for source-specific multicast
RFC 4607 Source-specific multicast for IP

Open Shortest Path First (OSPF)

OSPF link-local signaling
OSPF MD5 authentication
Out-of-band LSDB resync
RFC 1245 OSPF protocol analysis
RFC 1246 Experience with the OSPF protocol
RFC 1370 Applicability statement for OSPF
RFC 1765 OSPF database overflow
RFC 2328 OSPFv2
RFC 2370 OSPF opaque LSA option
RFC 2740 OSPFv3 for IPv6
RFC 3101 OSPF Not-So-Stubby Area (NSSA) option
RFC 3509 Alternative implementations of OSPF area border routers
RFC 3623 Graceful OSPF restart
RFC 3630 Traffic engineering extensions to OSPF
RFC 4552 Authentication/confidentiality for OSPFv3
RFC 5329 Traffic engineering extensions to OSPFv3
RFC 5340 OSPFv3 for IPv6 (partial support)

Quality of Service (QoS)

IEEE 802.1p Priority tagging
RFC 2211 Specification of the controlled-load network element service
RFC 2474 DiffServ precedence for eight queues/port
RFC 2475 DiffServ architecture
RFC 2597 DiffServ Assured Forwarding (AF)
RFC 2697 A single-rate three-color marker
RFC 2698 A two-rate three-color marker
RFC 3246 DiffServ Expedited Forwarding (EF)

Resiliency Features

ITU-T G.8023 / Y.1344 Ethernet Ring Protection Switching (ERPS)
IEEE 802.1ag CFM Continuity Check Protocol (CCP)
IEEE 802.1AXLink aggregation (static and LACP)
IEEE 802.1D MAC bridges
IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
IEEE 802.3adStatic and dynamic link aggregation
RFC 5798 Virtual Router Redundancy Protocol version 3 (VRRPv3) for IPv4 and IPv6

Routing Information Protocol (RIP)

RFC 1058 Routing Information Protocol (RIP)
RFC 2080 RIPng for IPv6
RFC 2081 RIPng protocol applicability statement
RFC 2082 RIP-2 MD5 authentication
RFC 2453 RIPv2

Security Features

SSH remote login
SSLv2 and SSLv3
TACACS+ accounting, authentication and authorisation (AAA)
IEEE 802.1X authentication protocols (TLS, TTLS, PEAP and MD5)
IEEE 802.1X multi-supplicant authentication
IEEE 802.1X port-based network access control
RFC 2560 X.509 Online Certificate Status Protocol (OCSP)
RFC 2818 HTTP over TLS ("HTTPS")
RFC 2865 RADIUS authentication
RFC 2866 RADIUS accounting
RFC 2868 RADIUS attributes for tunnel protocol support
RFC 2986 PKCS #10: certification request syntax specification v1.7
RFC 3546 Transport Layer Security (TLS) extensions
RFC 3579 RADIUS support for Extensible Authentication Protocol (EAP)
RFC 3580 IEEE 802.1x RADIUS usage guidelines
RFC 3748 PPP Extensible Authentication Protocol (EAP)
RFC 4251 Secure Shell (SSHv2) protocol architecture
RFC 4252 Secure Shell (SSHv2) authentication protocol
RFC 4253 Secure Shell (SSHv2) transport layer protocol
RFC 4254 Secure Shell (SSHv2) connection protocol
RFC 5246 Transport Layer Security (TLS) v1.2
RFC 5280 X.509 certificate and Certificate Revocation List (CRL) profile
RFC 5425 Transport Layer Security (TLS) transport mapping for Syslog
RFC 5656 Elliptic curve algorithm integration for SSH
RFC 6125 Domain-based application service identity within PKI using X.509 certificates with TLS
RFC 6614 Transport Layer Security (TLS) encryption for RADIUS
RFC 6668 SHA-2 data integrity verification for SSH

Services

RFC 854 Telnet protocol specification
RFC 855 Telnet option specifications
RFC 857 Telnet echo option
RFC 858 Telnet suppress go ahead option
RFC 1091 Telnet terminal-type option
RFC 1350 Trivial File Transfer Protocol (TFTP)
RFC 1985 SMTP service extension
RFC 2049 MIME
RFC 2131 DHCPv4 (server, relay and client)
RFC 2132 DHCP options and BootP vendor extensions

RFC 2616 Hypertext Transfer Protocol - HTTP/1.1
RFC 2821 Simple Mail Transfer Protocol (SMTP)
RFC 2822 Internet message format
RFC 3046 DHCP relay agent information option (DHCP option 82)
RFC 3315 DHCPv6 (server, relay and client)
RFC 3633 IPv6 prefix options for DHCPv6
RFC 3646 DNS configuration options for DHCPv6
RFC 3993 Subscriber-ID suboption for DHCP relay agent option
RFC 4330 Simple Network Time Protocol (SNTP) version 4
RFC 5905 Network Time Protocol (NTP) version 4

VLAN Support

Generic VLAN Registration Protocol (GVRP)
IEEE 802.1ad Provider bridges (VLAN stacking, Q-in-Q)
IEEE 802.1Q Virtual LAN (VLAN) bridges
IEEE 802.1v VLAN classification by protocol and port
IEEE 802.3ac VLAN tagging

Voice over IP (VoIP)

LLDP-MED ANSI/TIA-1057
Voice VLAN

Feature Licenses

NAME	DESCRIPTION	INCLUD	STACK LICENSING
AT-FL-x530-01	x530 premium license	▶ OSPFv2 (12,000 routes) ▶ BGP4/4+ (5,000 routes) ▶ PIMv4-SM, DM and SSM v4 ▶ VLAN double tagging (Q-in-Q) ▶ VLAN translation ▶ RIPng (5,000 routes) ▶ OSPFv3 (6,000 routes) ▶ MLDv1/v2 ▶ PIM-SMv6/SSMv6 ▶ RADIUS-Full ▶ VRF-Lite (64 domains) ▶ UDLD	▶ One license per stack member
AT-FL-x530-AM20-1YR	AMF Master license	▶ AMF Master 20 nodes for 1 year	▶ One license per stack
AT-FL-x530-AM20-5YR	AMF Master license	▶ AMF Master 20 nodes for 5 years	▶ One license per stack
AT-FL-x530-AM40-1YR	AMF Master license	▶ AMF Master 40 nodes for 1 year	▶ One license per stack
AT-FL-x530-AM40-5YR	AMF Master license	▶ AMF Master 40 nodes for 5 years	▶ One license per stack
AT-FL-x530-8032	ITU-T G.8032 license	▶ G.8032 ring protection ▶ Ethernet CFM	▶ One license per stack member
AT-FL-x530-CPOE	Continuous PoE license	▶ Continuous PoE power for GPX models	▶ One license per stack member
AT-FL-x530-MSTK	Mixed stacking license	▶ Stack x530 with x530L switches	▶ One license per stack member
AT-FL-x530-OF13-1YR	OpenFlow license	▶ OpenFlow v1.3 for 1 year	▶ Not supported on a stack
AT-FL-x530-OF13-5YR	OpenFlow license	▶ OpenFlow v1.3 for 5 years	▶ Not supported on a stack
AT-FL-x530-AWC40-1YR[1]	AWC license	▶ Autonomous Wave Controller (AWC) license for up to 40 access points for 1 year	▶ One license per stack
AT-FL-x530-AWC40-5YR[1]	AWC license	▶ Autonomous Wave Controller (AWC) license for up to 40 access points for 5 years	▶ One license per stack
AT-FL-x530-CB40-1YR[2]	AWC-CB license	▶ AWC-Channel Blanket license for up to 40 access points for 1 year	▶ One license per stack
AT-FL-x530-CB40-5YR[2]	AWC-CB license	▶ AWC-Channel Blanket license for up to 40 access points for 5 years	▶ One license per stack
AT-FL-x530-SC40-1YR[3]	AWC-SC license	▶ AWC-Smart Connect license for up to 40 access points for 1 year	▶ One license per stack
AT-FL-x530-SC40-5YR[3]	AWC-SC license	▶ AWC-Smart Connect license for up to 40 access points for 5 years	▶ One license per stack

[1] 5 APs can be managed for free. Add an additional 40 APs with an AWC license
[2] Channel Blanket is not available as a free service. Both an AWC-CB license and an AWC license are required for Channel Blanket to operate. This features is supported on TQ5403 and TQ5403e access points
[3] Smart Connect is not available as a free service. Both an AWC-SC license and an AWC license are required for Smart Connect to operate. This feature is supported on TQ5403, TQ5403e and TQm5403 access points

Ordering Information

Switches

19 inch rack-mount brackets included

AT-x530-28GTXm-xx
20-port 10/100/1000T and 4-port 100M/1/2.5/5G stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530-28GPXm-xx
20-port 10/100/1000T and 4-port 100M/1/2.5/5G PoE+ stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530-52GTXm-xx
40-port 10/100/1000T and 8-port 100M/1/2.5/5G stackable switch with 4 SFP+ ports and 2 fixed power supplies

AT-x530-52GPXm-xx
40-port 10/100/1000T and 8-port 100M/1/2.5/5G PoE+ stackable switch with 4 SFP+ ports and 2 fixed 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

10G SFP+ Modules

Any 10G SFP+ module or cable can be used for stacking with the front panel 10G ports

AT-SP10SR
10GSR 850 nm short-haul, 300 m with MMF

AT-SP10SR/I
10GSR 850 nm short-haul, 300 m with MMF industrial temperature

AT-SP10LRM
10GLRM 1310 nm short-haul, 220 m with MMF

AT-SP10LR
10GLR 1310 nm medium-haul, 10 km with SMF

AT-SP10LR/I
10GLR 1310 nm medium-haul, 10 km with SMF industrial temperature

AT-SP10LR20/I
10GER 1310nm long-haul, 20 km with SMF industrial temperature

AT-SP10ER40/I
10GER 1310nm long-haul, 40 km with SMF industrial temperature

AT-SP10ZR80/I
10GER 1550nm long-haul, 80 km with SMF industrial temperature

AT-SP10T [4, 5]
10GBase-T 20 m copper

AT-SP10TW1
1 meter SFP+ direct attach cable

AT-SP10TW3
3 meter SFP+ direct attach cable

1000Mbps SFP Modules

AT-SPSX
1000SX GbE multi-mode 850 nm fiber up to 550 m

AT-SPEX
1000X GbE multi-mode 1310 nm fiber up to 2 km

AT-SPSX/I
1000SX GbE multi-mode 850 nm fiber up to 550 m industrial temperature

AT-SPLX10
1000LX GbE single-mode 1310 nm fiber up to 10 km

AT-SPLX10/I
1000LX GbE single-mode 1310 nm fiber up to 10 km, industrial temperature

AT-SPBD10-13
1000LX GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

AT-SPBD10-14
1000LX GbE Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 10 km

AT-SPLX40
1000LX GbE single-mode 1310 nm fiber up to 40 km

[4] Using Cat 6a/7 cabling
[5] Up to 100 m running at 1G

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