Allied Telesis™

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.

PoE *plus*   AlliedWare Plus™ OPERATING SYSTEM   IP6 READY

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 x 10M/100M/1Gigabit ports, 4 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.

Powerful network management

Allied Telesis Autonomous Management Framework™ (AMF) automates many everyday tasks including configuration management, easing the workload of modern networks. The entire network can be managed as a single virtual device with powerful centralized features. Growing the network can be accomplished with plug-and-play simplicity, and network node recovery is fully zero-touch.

AMF secure mode increases network security with management traffic encryption, authorization, and monitoring. AMF Guestnode allows third party devices, such as IP phones and security cameras, to be part of an AMF network.

Network resiliency

Today's converging online services means there is increasing demand for highly-available networks with minimal downtime. VCStack™, in conjunction with link aggregation, provides a network with no single point of failure and application resiliency.

x530 Series switches can form a VCStack of up to four units for enhanced resiliency and simplified device management. Long Distance Stacking (VCStack LD), which

enables stacks to be created over long distance fiber links, makes the x530 Series the perfect choice for distributed environments too.

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.

Reliable

The x530 Series was designed with reliability in mind, and guarantees continual delivery of essential services. With dual built-in power supplies and near-hitless online stack reconfiguration, maintenance may be performed without affecting network uptime.

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 spread of high-speed wireless (802.11ac or "Wave2") can be problematic for network infrastructure. Unless infrastructure is upgraded to cope with increased speeds, a bottleneck occurs which negatively impacts the effectiveness of the wireless network. However, increasing speeds from 1 Gigabit has traditionally meant

moving to 10 Gigabit, which requires expensive new cabling. The x530 series solves this issue, because it provides support for both 2.5 and 5 Gigabit. At these speeds, the wireless network runs at full capacity, and there is no need to upgrade existing Cat5e and Cat6/6A cables.

eco friendly

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

▶ Autonomous Management Framework™ (AMF)

▶ VCStack™ up to 4 switches

▶ Stack over long distances for distributed resilient backbones

▶ Multi-Gigabit Ethernet ports for 1G/2.5G/5G

▶ 2.5G for high-speed wireless APs

▶ EPSR™ and G.8032 ERPS for resilient rings

▶ Power over Ethernet (PoE+)

▶ Continuous PoE

▶ Active Fiber Monitoring (AFM)

▶ Upstream Forwarding Only (UFO)

▶ VLAN Translation

Key Features

Allied Telesis Autonomous Management Framework™ (AMF)

▶ Allied Telesis Autonomous Management Framework (AMF) is a sophisticated suite of management tools that provide a simplified approach to network management. Powerful features like centralized management, auto-backup, auto-upgrade, auto-provisioning and auto-recovery enable plug-and-play networking and zero-touch management.

▶ Any x530 Series switch 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.

Virtual Chassis Stacking (VCStack™)

▶ Create a VCStack of up to 4 units with 40 Gbps of stacking bandwidth for each unit. Stacking links are connected in a ring so each device has dual connections to further improve resiliency. VCStack provides a highly-available system where network resources are spread out across stacked units, reducing the impact if one of the units fails. Aggregating switch ports on different units across the stack provides excellent network 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 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.

G.8032 Ethernet Ring Protection

▶ G.8032 provides standards-based high-speed ring protection, that can be deployed as stand-alone, or 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. Speeds of 2.5 Gigabit and 5 Gigabit are supported so you can take full advantage of new applications such as Wave2 access points, or upgrade your existing network, 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 supports both unicast and multicast traffic.

High Reliability

▶ The x530 series switches feature front to back cooling and dual fixed internal PSUs.

sFlow

▶ sFlow is an industry-standard technology for monitoring high-speed switched networks. It provides complete visibility into network use, enabling performance optimization, usage accounting/billing, and defense against security threats. Sampled packets sent to a collector ensure a real-time view of network traffic.

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.

Tri-authentication

▶ Authentication options on the x530 Series also include alternatives to IEEE 802.1x port-based authentication, such as web authentication to enable guest access and MAC authentication for endpoints that do not have an IEEE 802.1x supplicant. All three authentication methods—IEEE 802.1x, MAC-based and Web-based—can be enabled simultaneously on the same port for tri-authentication.

TACACS+ Command Authorization

▶ Centralized control over which commands may be issued by a specific AlliedWare Plus device users. TACACS+ command authorization complements authentication and accounting services for a complete AAA solution.

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.

▶ In Metro networks, 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. This situation can occur if two companies have merged and the same VLAN-ID is used for two different purposes.

Key Solutions

Legend:
- VCStack link
- 10 Gigabit link
- 1 Gigabit link
- 10/100 link
- Link aggregation
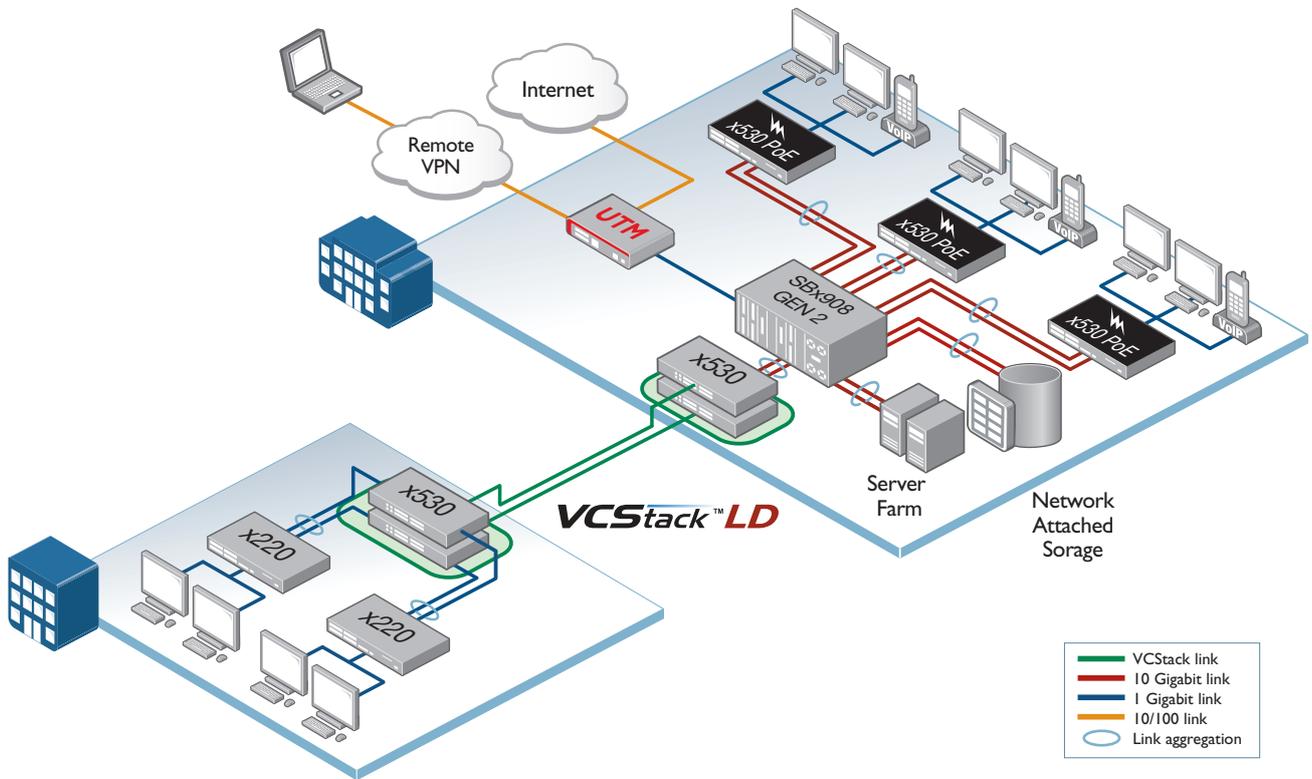
Resilient distribution switching

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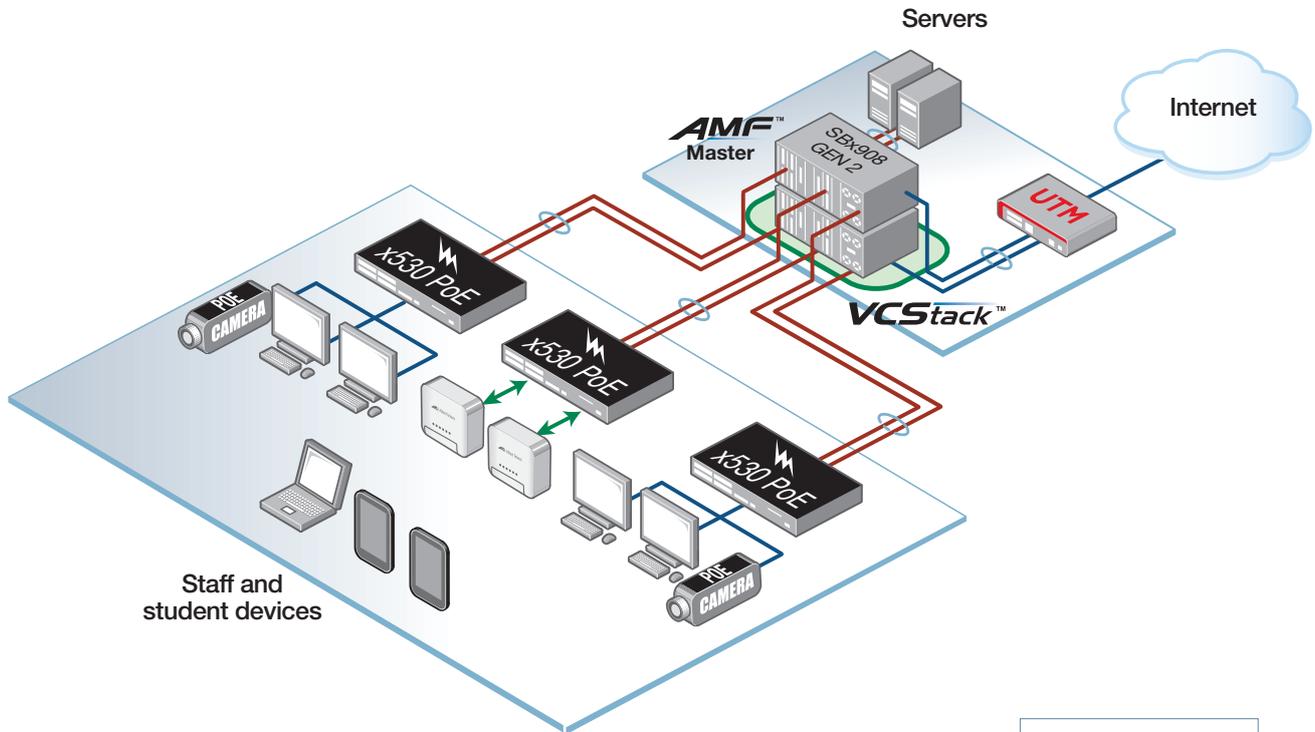
Allied Telesis x530 Series switches support Enterprises and their use of business-critical online resources and applications, with a resilient and reliable distribution solution.

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 aggregations are used to provide both resiliency back to the core chassis, and an increase in available bandwidth over a single link.

With 720 Watts of PoE power available, the x530 can provide up to 30 Watts per port, supporting a wide range of powered devices.

Key Solutions

Servers

Internet

AMF™
Master

SBx908
GEN 2

UTM

VCStack™

x530 PoE

x530 PoE

x530 PoE

POE CAMERA

POE CAMERA

Staff and
student devices

	10 Gigabit link
	2.5 or 5 Gigabit link
	1 Gigabit link
	Link aggregation
	High Speed Wireless Network Device with 2.5G/5 Gigabit Interface

2.5/5G Multi-Gigabit connectivity

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

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.

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

* 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 four 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
- 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
- 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)

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)

Power and Noise Characteristics

100-240 VAC, 50/60 Hz, 1.0A max per input (28GTXm), 6.0A max per input (28GPXm)

PRODUCT	NO POE LOAD			FULL POE+ LOAD			MAX POE POWER	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	900.0	614	44	720W	24	24	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

Standards and Protocols

AlliedWare Plus Operating System
Version 5.4.9-1

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

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 802.3ab 1000BASE-T
IEEE 802.3ae 10 Gigabit Ethernet
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet up to 30W (PoE+)
IEEE 802.3az Energy Efficient Ethernet (EEE)
IEEE 802.3bz 2.5GBASE-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 802.1AB Link 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 802.1AX Link 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 802.3ad Static 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

Ordering Information

NAME	DESCRIPTION	INCLUDES	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) ▶ 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-x530-8032	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 model	▶ One license per stack member
AT-FL-x530-VLTR	VLAN translation license	▶ VLAN translation	▶ One license per stack member
AT-FL-x530-MSTK	Mixed stacking license	▶ Stack x530 with x530L switches	▶ One license per stack member

Switches
19 inch rack-mount brackets included

AT-x530-28GTXm-00
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-00
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

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 [2, 3]
10GBase-T 20 m copper

AT-SP10TW1
1 meter SFP+ direct attach cable

AT-SP10TW3
3 meter SFP+ direct attach cable

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

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

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