









## x530L Series | Stackable Intelligent Layer-3 Switches

### Product Specifications

PRODUCT	10/100/1000T (RJ-45) COPPER PORTS	1/10 GIGABIT SFP+ PORTS	STACKING PORTS	POE+ ENABLED PORTS	SWITCHING FABRIC	FORWARDING RATE
x530L-28GTX	24	4	2*	-	128Gbps	95.2Mpps
x530L-28GPX	24	4	2*	24	128Gbps	95.2Mpps
x530L-52GTX	48	4	2*	-	176Gbps	130.9Mpps
x530L-52GPX	48	4	2*	48	176Gbps	130.9Mpps

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

### Physical Specifications

PRODUCT	WIDTH X DEPTH X HEIGHT	MOUNTING	WEIGHT		PACKAGED DIMENSIONS
			UNPACKAGED	PACKAGED	
x530L-28GTX	441 x 323 x 44 mm (17.36 x 12.72 x 1.73 in)	Rack-mount	4.4 kg (9.07 lbs)	6.3 kg (13.89 lbs)	577 x 440 x 153 mm (22.72 x 17.32 x 6.02 in)
x530L-28GPX	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.2 kg (13.67 lbs)	8.4 kg (18.52 lbs)	577 x 548 x 153 mm (22.72 x 21.57 x 6.02 in)
x530L-52GTX	441 x 323 x 44 mm (17.36 x 12.72 x 1.73 in)	Rack-mount	5.2 kg (11.46 lbs)	7.1 kg (15.65 lbs)	577 x 440 x 128 mm (22.72 x 17.32 x 6.02 in)
x530L-52GPX	441 x 421 x 44 mm (17.36 x 16.57 x 1.73 in)	Rack-mount	6.7 kg (14.77 lbs)	8.9 kg (19.62 lbs)	577 x 548 x 153 mm (22.72 x 21.57 x 6.02 in)

### Power and Noise Characteristics

6.0A MAX PER INPUT (28GPX/52GPX), 1.0A MAX PER INPUT (28GTX/52GTX)										
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)
x530L-28GTX	39	133	42*	-	-	-	-	-	-	-
x530L-28GPX	70	239	42*	890	3037	42*	740	24	24	24
x530L-52GTX	60	205	42*	-	-	-	-	-	-	-
x530L-52GPX	95	324	42*	950	3242	42*	740	48	48	24

\* This figure is under 30 degree C ambient temperature

Noise: tested to ISO7779; front bystander position

### Latency (microseconds)

PRODUCT	PORT SPEED			
	10MBPS	100MBPS	1GBPS	10GBPS
x530L-28GTX	29.91µs	6.06µs	3.98µs	1.63µs
x530L-28GPX	29.91µs	6.06µs	3.98µs	1.63µs
x530L-52GTX	30.98µs	8.34µs	5.27µs	1.67µs
x530L-52GPX	30.98µs	8.34µs	5.27µs	1.67µs

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### Standards and Protocols

#### AlliedWare Plus Operating System

Version 5.5.0-2

#### 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 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 802.3ab 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 802.3u 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 (SMIPv2)  
RFC 2579 Textual conventions for SMIPv2  
RFC 2580 Conformance statements for SMIPv2  
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

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- 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 Authorization (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	INCLUDES	STACK LICENSING
AT-FL-x530L-01	x530L premium license	<ul style="list-style-type: none"> <li>▶ OSPFv2 (256 routes)</li> <li>▶ BGP4 (256 routes)</li> <li>▶ PIMv4-SM, DM and SSM v4</li> <li>▶ VLAN double tagging (Q-in-Q)</li> <li>▶ RIPng (256 routes)</li> <li>▶ OSPFv3 (256 routes)</li> <li>▶ MLDv1/v2</li> <li>▶ PIM-SMv6/SSMv6</li> <li>▶ RADIUS-Full</li> <li>▶ UDLD</li> <li>▶ VLAN Translation</li> </ul>	▶ 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-x530L-8032	ITU-T G.8032 license	<ul style="list-style-type: none"> <li>▶ G.8032 ring protection</li> <li>▶ Ethernet CFM</li> </ul>	▶ One license per stack member
AT-FL-x530L-CPOE	Continuous PoE license	▶ Continuous PoE power	▶ One license per stack member
AT-FL-x530L-MSTK	Mixed Stacking license	▶ Stack x530L with x530 Series switches	▶ One license per stack member
AT-FL-x530L-OF13-1YR	OpenFlow license	▶ OpenFlow v1.3 (1250 entries) for 1 year	▶ Not supported on a stack
AT-FL-x530L-OF13-5YR	OpenFlow license	▶ OpenFlow v1.3 (1250 entries) for 5 years	▶ Not supported on a stack

### Ordering Information



### Switches

19 inch rack-mount brackets included

#### AT-x530L-28GTX-xx

24-port 10/100/1000T stackable switch with 4 SFP+ ports and 2 fixed power supplies

#### AT-x530L-28GPX-xx

24-port 10/100/1000T PoE+ stackable switch with 4 SFP+ ports and 2 fixed power supplies

#### AT-x530L-52GTX-xx

48-port 10/100/1000T stackable switch with 4 SFP+ ports and 2 fixed power supplies

#### AT-x530L-52GPX-xx

48-port 10/100/1000T 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

## x530L Series | Stackable Intelligent Layer-3 Switches

### 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 1310 nm long-haul, 20 km with SMF industrial temperature

#### AT-SP10ER40/I

10GER 1550 nm long-haul, 40 km with SMF industrial temperature

#### AT-SP10ZR80/I

10GER 1550 nm long-haul, 80 km with SMF industrial temperature

#### AT-SP10T<sup>1,2</sup>

10GBase-T 20 m copper

#### AT-SP10BD10/I-12

10G Bi-Di, 1270 nm TX/1330 nm RX, 10km, industrial temperature, TAA<sup>3</sup>

#### AT-SP10BD10/I-13

10G Bi-Di, 1330 nm TX/1270 nm RX, 10km, industrial temperature, TAA<sup>3</sup>

#### AT-SP10BD20-12

10G Bi-Di, 1270 nm TX/1330 nm RX, 20km, TAA<sup>3</sup>

#### AT-SP10BD20-13

10G Bi-Di, 1330 nm TX/1270 nm RX, 20km, TAA<sup>3</sup>

#### AT-SP10BD40/I-12

10G Bi-Di, 1270 nm TX/1330 nm RX, 40km, industrial temperature, TAA<sup>3</sup>

#### AT-SP10BD40/I-13

10G Bi-Di, 1330 nm TX/1270 nm RX, 40km, industrial temperature, TAA<sup>3</sup>

#### 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-SPSX/I

1000SX GbE multi-mode 850 nm fiber up to 550 m industrial temperature

#### AT-SPEX

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

#### 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 (LC) GbE Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 10 km

#### AT-SPBD10-14

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

#### AT-SPBD40-13/I

1000LX (LC) GbE single-mode Bi-Di (1310 nm Tx, 1490 nm Rx) fiber up to 40 km, industrial temperature

#### AT-SPBD40-14/I

1000LX (LC) GbE single-mode Bi-Di (1490 nm Tx, 1310 nm Rx) fiber up to 40 km, industrial temperature

#### AT-SPLX40

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

<sup>1</sup> Using Cat 6a/7 cabling

<sup>2</sup> Up to 100 m running at 1G

<sup>3</sup> Trade Act Agreement Compliant