AT-IX5-28GPX

HIGH AVAILABILITY VIDEO SURVEILLANCE SWITCH

The Allied Telesis IX5-28GPX offers an impressive set of features in a high-value package, making it ideal for IP video surveillance environments.

AlliedWare Plus™ OPERATING SYSTEM

The Allied Telesis IX5-28GPX provides a high performing and scalable solution for today's networks. With 24 PoE+ enabled 10/100/1000Mbps ports, two 1/10 Gigabit uplinks, plus the ability to stack up to four units, the AT-IX5-28GPX is the ideal solution for video surveillance applications where high performance and resilient PoE power are critical.

High availability

The IX5 was designed with reliability in mind. It guarantees continual delivery of data and streaming video. Dual hot-swappable load-sharing power supplies provide resilient system and end-point power, with up to 30 Watts available to power today's pan, tilt and zoom cameras. Factor in the ability to operate at up to 50°C, and the IX5 is an easy choice for modern video surveillance environments.

PoE plus

Network resiliency

A Virtual Chassis Stack (VCStack™) of up to four devices can be formed so the network can be maintained or reconfigured as necessary, without affecting uptime.

Ethernet Protection Switched Ring (EPSRing™) ensures distributed network environments have high-speed access to online resources and applications, and guaranteed data throughput.

Simplified network management

Modern converged networks have increasing management requirements. Allied Telesis Management Framework (AMF) automates many everyday tasks, including configuration management, saving you valuable time and resources. The complete network can be managed as a single virtual device with powerful centralized management features. Growing the network can be accomplished with plug-and-play simplicity, and network node recovery is fully zero-touch.

Advanced operating system

The IX5 runs the advanced AlliedWare Plus™ fully featured operating system, delivering a rich feature set and an industry-standard CLI. The industry-standard CLI reduces training requirements and is consistent across all AW+ devices, simplifying network management.

Secure

Advanced security features protect the network from the edge to the core. Unprecedented control over user access is provided with Network Access Control (NAC), to mitigate threats to network infrastructure. This ensures the network is accessed only by known users and devices - users' adherence to network security policies is checked, and either access is granted or remediation is offered. Secure access can also be provided for guests. A secure network environment is guaranteed, with powerful control over network traffic types, secure management options, and other multi- layered security features built right into the AT-IX5-28GPX switch.

Future-proof

The flexibility of the AT-IX5-28GPX, coupled with the ability to seamlessly add new nodes to a VCStack of multiple units, ensures a future-proof network. The AT-IX5-28GPX comes with a comprehensive IPv6 feature set, ensuring it is ready for future network traffic demands.

ECO friendly

The IX5 supports Energy Efficient Ethernet, which automatically reduces the power consumed by the switch whenever there is no traffic on a port. This sophisticated feature can significantly reduce operating costs, by reducing the power requirements of the switch and any associated cooling equipment.

eco friendly

VCStack™   **EPSRing™**   **AMF™**

New features

» UniDirectional Link Detection (UDLD)
» Optical DDM MIB
» ACLs for management traffic

Key Features

Reliable

» Dual hot-swappable load-sharing power supplies maximize network uptime, ensuring a resilient solution where always-on access is required.

Allied Telesis Management Framework (AMF)

» Allied Telesis Management Framework (AMF) is a sophisticated suite of management tools that provide a simplified approach to network management. Common tasks are automated or made so simple that the every-day running of a network can be achieved without the need for highly-trained, and expensive, network engineers. Powerful features like centralized management, auto-backup, auto-upgrade, auto-provisioning and auto-recovery enable plug-and-play networking and zero-touch management.

VCStack™(Virtual Chassis Stacking)

» Create a VCStack of up to four IX5 units with 40Gbps of stacking bandwidth to each unit. 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

» Long-distance stacking allows a VCStack to be created over longer distances, perfect for a distributed network environment.

EPSRing™(Ethernet Protection Switched Ring)

» EPSRing and 10 Gigabit Ethernet allow several IX5 switches to form a high-speed protected ring capable of recovery within as little as 50ms. This feature is ideal for large IP surveillance environments.

» Super-Loop Protection enables a link between two EPSR nodes to be in separate EPSR domains, improving redundancy and network fault resiliency.

Industry-leading Quality of Service (QoS)

» Comprehensive low-latency wire speed QoS provides flow-based traffic management with full classification, prioritization, traffic shaping and min/max bandwidth profiles. Boosted network performance and guaranteed delivery of business-critical Ethernet services and applications are provided. Time-critical services such as voice and video take precedence over non-essential services such as file downloads, maintaining responsiveness of Enterprise applications.

Loop Protection

» Thrash limiting, also known as rapid MAC movement, detects and resolves network loops. It is highly user-configurable — from the rate of looping traffic to the type of action the switch should take when it detects a loop.

» With thrash limiting, the switch only detects a loop when a storm has occurred, which can potentially cause disruption to the network. To avoid this, loop detection works in conjunction with thrash limiting to send special Loop Detection Frame (LDF) packets that the switch listens for. If a port receives an LDF packet, the port, or link can be disabled, or an SNMP trap can be sent. This feature can help to detect loops before a network storm occurs, avoiding the risk and inconvenience of traffic disruption.

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, tilt and zoom security cameras.

Link Layer Discovery Protocol – Media Endpoint Discovery (LLDP – MED)

» LLDP-MED extends LLDP basic network endpoint discovery and management functions. LLDP-MED allows for media endpoint specific messages, providing detailed information on power requirements, network policy, location discovery (for Emergency Call Services) and inventory.

Voice VLAN

» Voice VLAN automatically separates voice and data traffic into two different VLANs. This automatic separation places delay-sensitive traffic into a voice-dedicated VLAN, which simplifies QoS configurations.

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 it always has a real-time view of network traffic.

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.

Tri-authentication

» Authentication options on the IX5 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.

Access Control Lists (ACLs)

» AlliedWare Plus delivers industry-standard Access Control functionality through ACLs. ACLs filter network traffic to control whether routed packets are forwarded or blocked at the port interface. This provides a powerful network security mechanism to select the types of traffic to be analyzed, forwarded, or influenced in some way.

Optical DDM

» Most modern optical SFP/SFP+/XFP transceivers support Digital Diagnostics Monitoring (DDM) functions according to the specification SFF-8472. This enables real time monitoring of the 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.

UniDirectional link Detection

» UniDirectional Link Detection (UDLD) is useful for monitoring fiber-optic links between two switches that use two single-direction fibers to transmit and receive packets. UDLD prevents traffic from being sent across a bad link by blocking the ports at both ends of the link in the event that either the individual transmitter or receiver for that connection fails.
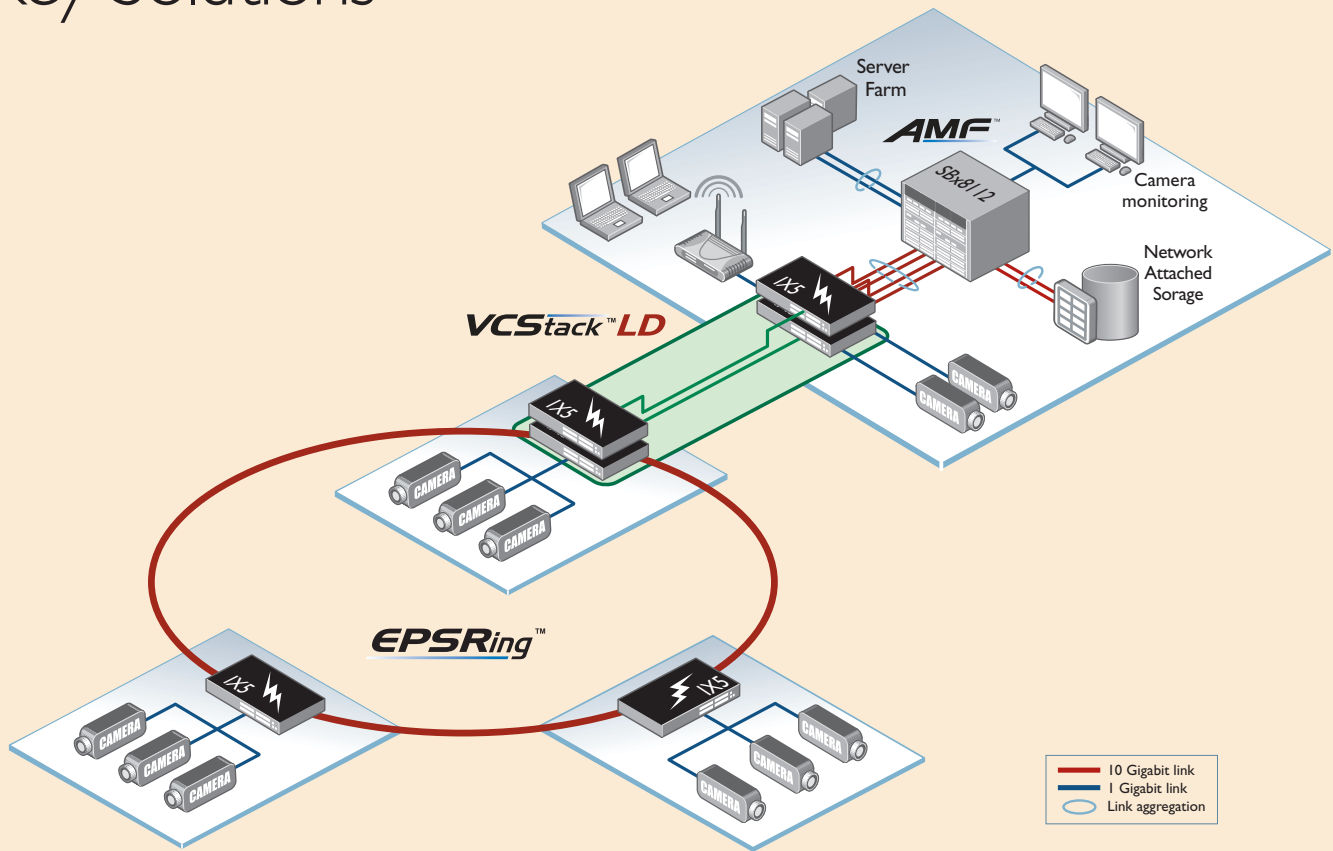
Key Solutions

Diagram 1: IP Video Surveillance

IP Video Surveillance

With the evolution of CCTV technology to digital IP-based systems, the emphasis has moved from simple video footage monitoring, to intelligent systems with video analytics capable of identifying abnormal events or behavior. As intelligence increases in these systems, so too do the applications for this technology – from retail outlets, warehouses and office buildings, to hotels, hospitals and advanced traffic monitoring systems.

Modern high definition digital images are sharper and clearer than ever before. Large amounts of digital video can be stored on Network-Attached Storage (NAS) systems, and digital images don't degrade over time.

Allied Telesis provides secure and resilient IP video surveillance network solutions. The key features of our AT-IX5-28GPX switch make it ideal for use in advanced surveillance systems:

■ Dual hot-swappable load-sharing power supplies, and support for operation up to 50°C ensure maximum network uptime.
■ Power over Ethernet (PoE+) provides up to 30 Watts to end-points, supporting the latest generation of pan, tilt and zoom IP cameras.
■ High performance multicast support manages large numbers of digital video streams across the network.
■ Long-Distance Virtual Chassis Stacking (VCStack-LD) is ideal to spread network distribution, while keeping total resilience.
■ Ethernet Protection Switched Rings (EPSR) provides a high-speed ring topology with failover in a little as 50ms, supporting large IP surveillance environments with an 'always-on' solution.

With the AT-IX5-28GPX and other advanced switching products, Allied Telesis IP video surveillance solutions are dependable, scalable and ready for the next generation of digital monitoring technologies.

IX5-28GPX | High Availability Video Surveillance Switch

Product Specifications

PRODUCT	10/100/1000T (RJ-45) COPPER PORTS	100/1000X SFP PORTS	1/10 GIGABIT SFP+ PORTS	10 GIGABIT STACKING PORTS	MAX POE+ PORTS	SWITCHING FABRIC	FORWARDING RATE
AT-IX5-28GPX	24	-	2	2*	24	128Gbps	95.2Mpps

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

Performance
» 40 Gbps of stacking bandwidth
» Supports 13kB Jumbo frames
» Wirespeed multicasting
» Up to 16K MAC addresses
» 512MB DDR SDRAM
» 64MB flash memory
» Packet Buffer memory: 2MB

Reliability
» Modular AlliedWare Plus operating system
» Redundant power supplies load share 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

Power Characteristics
» AC voltage: 90 to 260V (auto-ranging)
» Frequency: 47 to 63Hz

Expandability
» Stackable up to four units of IX5 in a VCStack

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
» Stacking ports can be configured as 10G Ethernet ports
» Port speed and duplex configuration can be set manually or by auto-negotiation

Diagnostic Tools
» Built-In Self Test (BIST)
» Find-me device locator
» Cable fault locator (TDR)
» UniDirectional Link Detection (UDLD)
» Automatic link flap detection and port shutdown
» Optical Digital Diagnostic Monitoring (DDM)
» Ping polling for IPv4 and IPv6
» Port mirroring
» TraceRoute for IPv4 and IPv6

IPv4 Features
» Black hole routing
» Directed broadcast forwarding
» DNS relay
» Policy-based routing
» IPv4 static routing
» UDP broadcast helper (IP helper)

IPv6 Features
» DHCPv6 relay, DHCPv6 client
» DNSv6 relay, DNSv6 client
» IPv4 and IPv6 dual stack
» IPv6 hardware ACLs
» Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
» NTPv6 client and server
» IPv6 static routing

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

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

Resiliency
» Stacking ports can be configured as 10G Ethernet ports
» Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
» Dynamic link failover (host attach)
» EPSRing (Ethernet Protection Switched Rings) with SuperLoop Protection (SLP)
» EPSR enhanced recovery for extra resiliency
» Long-Distance stacking (LD-VCStack)
» Loop protection: loop detection and thrash limiting
» PVST+ compatibility mode

» STP root guard
» VCStack fast failover minimizes network disruption

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

Environmental Specifications
» Operating temperature range: 0°C to 50°C (32°F to 122°F) Derated by 1°C per 305 meters (1,000 ft)
» 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: EN55022 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

Country of Origin
» China

Physical Specifications and MTBF Figures

PRODUCT	WIDTH	DEPTH	HEIGHT	MOUNTING	WEIGHT	
					UNPACKAGED	PACKAGED
AT-IX5-28GPX	440 mm (17.32 in)	480 mm (18.89 in)	44 mm (1.73 in)	1RU Rack-mount	5.4 kg (11.91 lb)	7.4 kg (16.32 lb)

Power and Noise Characteristics

PRODUCT	NO POE LOAD			FULL POE+ LOAD		
	MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE	MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE
AT-IX5-28GPX	81W	276 BTU/h	44 dBA	626W	703 BTU/hr	52 dBA

Noise: tested to ISO7779; front bystander position

Latency (microseconds)

PRODUCT	PORT SPEED			
	10MBPS	100MBPS	1GBPS	10GBPS
AT-IX5-28GPX	117μs	14.4μs	4.4μs	3.1μs

PSU PoE Options

PSU	MAX POE POWER	MAX POE PORTS AT 15W PER PORT	MAX POE+ PORTS AT 30W PER PORT
1 x AT-PWR800	370w	24	12
2 x AT-PWR800	720w	24	24

Standards and Protocols

AlliedWare Plus Operating System
Version 5.4.5-1

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

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

Ethernet
IEEE 802.1AX Link aggregation (static and LACP)
IEEE 802.2   Logical Link Control (LLC)
IEEE 802.3   Ethernet
IEEE 802.3ab 1000BASE-T
IEEE 802.3ad Static and dynamic link aggregation
IEEE 802.3ae 10 Gigabit Ethernet
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet plus (PoE+)
IEEE 802.3az Energy Efficient Ethernet (EEE)
IEEE 802.3x Flow control - full-duplex operation
IEEE 802.3z 1000BASE-X

IPv4 Standards
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 Standards
RFC 1981   Path MTU discovery for IPv6
RFC 2460   IPv6 specification
RFC 2464   Transmission of IPv6 packets over Ethernet networks
RFC 3056   Connection of IPv6 domains via IPv4 clouds
RFC 3484   Default address selection for IPv6
RFC 3596   DNS extensions to support IPv6
RFC 4007   IPv6 scoped address architecture
RFC 4193   Unique local IPv6 unicast addresses
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
AMF MIB and SNMP traps
AT Enterprise MIB
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 2011   SNMPv2 MIB for IP using SMIv2
RFC 2012   SNMPv2 MIB for TCP using SMIv2
RFC 2013   SNMPv2 MIB for UDP using SMIv2
RFC 2096   IP forwarding table MIB
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 3164   Syslog protocol
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 4188   Definitions of managed objects for bridges
RFC 4318   Definitions of managed objects for bridges with RSTP
RFC 4560   Definitions of managed objects for remote ping, traceroute and lookup operations
RFC 6527   Definitions of managed objects for VRRPv3

Multicast Support

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)

RFC 1112	Host extensions for IP multicasting (IGMPv1)
RFC 2236	Internet Group Management Protocol v2 (IGMPv2)
RFC 3376	IGMPv3
RFC 4541	IGMP and MLD snooping switches

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

IEEE 802.1D	MAC bridges
IEEE 802.1s	Multiple Spanning Tree Protocol (MSTP)
IEEE 802.1w	Rapid Spanning Tree Protocol (RSTP)
RFC 5798	Virtual Router Redundancy Protocol version 3 (VRRPv3) for IPv4 and IPv6

Security

SSH remote login

SSLv2 and SSLv3

TACACS+ accounting and authentication

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 2246	TLS protocol v1.0
RFC 2818	HTTP over TLS ("HTTPS")
RFC 2865	RADIUS
RFC 2866	RADIUS accounting
RFC 2868	RADIUS attributes for tunnel protocol support
RFC 3280	Internet X.509 PKI Certificate and Certificate Revocation List (CRL) profile
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

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 2554	SMTP service extension for authentication
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

AT-IX5-28GPX Front view

AT-IX5-28GPX Rear view with 1 power supply

AT-IX5-28GPX Rear view with 2 power supplies

Ordering Information

Switch and Power Supply options

AT-IX5-28GPX-00
24-port 10/100/1000BASE-T stackable PoE+ switch with 4 SFP+ ports and 2 power supply bays
Note: Power supplies ordered separately

AT-RKMT-SL01
Sliding rack mount kit

AT-PWR800-xx
800W AC system and PoE+ power supply

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

10GbE SFP+ Modules

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-SP10TW1
1 meter SFP+ direct attach cable

* These modules support dual-rate 1G/10G operation

AT-SP10TW3
3 meter SFP+ direct attach cable

AT-SP10TW7
7 meter SFP+ direct attach cable

Stacking Accessories

AT-STACKXS/1.0
1 meter copper stacking cable

AT-STACKXS/7.0
7 meter copper stacking cable

AT-STACKOP/0.3
Optical Stacking Module, 300m with MMF

AT-STACKOP/9.0
Optical Stacking Module, 9km with SMF

SFP Modules

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

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

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

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

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

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

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

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

AT-SPZX80
1000ZX GbE single-mode 1550nm fiber up to 80km

Feature Licenses

NAME	DESCRIPTION	INCLUDES	STACK LICENSING
AT-FL-IX5-EPSR	IX5 EPSR Master and UDLD License	» EPSR Master » UDLD	» One license per stack member

the **solution** : the **network**