IE300 Series

Industrial Ethernet, Layer 3 Switches

Our ruggedized IE300 Industrial Ethernet switches are built for enduring performance in harsh environments, such as those found in manufacturing, transportation and physical security. Offering high throughput, rich functionality and advanced security features, IE300 switches deliver the performance and reliability demanded by industrial deployments in the Internet of Things (IoT) age.

Overview

The IE300 Series are wirespeed Layer 3 switches for industrial Ethernet applications. With a wide operating temperature range of between -40°C and 75°C, they tolerate harsh and demanding environments, such as those found in industrial and outdoor deployment.

Device management is provided via Web GUI, SNMP, Telnet, SSH, or Allied Telesis Management Framework™ (AMF). AMF is unique to Allied Telesis managed devices, offering simplified device provisioning, recovery and firmware upgrade management.

Performance

The IE300 Series of high performance and cost-effective managed switches meets the high reliability requirements of industrial network operations. These robust switches provide network managers with several key features, using the simple web-based management function, including port-based VLANs, IEEE 802.1p, QoS, port trunking/link aggregation, port mirroring, priority queues, and IEEE 802.1x security support. With support for up to 16K MAC addresses, the IE300 Series is the ideal option for integrating management into any network solution.

Securing the Network Edge

To ensure data protection, it is important to control network access. Protocols such as IEEE 802.1x port-based authentication guarantee that only known users are connected to the network. Unknown users who physically connect can be segregated into a pre-determined part of the network, offering network guests such benefits as Internet access, while ensuring the integrity of private network data.

Gigabit and Fast Ethernet Support

The IE300 Series SFP ports support both Gigabit and Fast Ethernet Small Form-Factor Pluggables (SFPs). This makes IE300 Series switches ideal for environments where Gigabit fiber switches will be phased in over time. This allows for connectivity to the legacy 100FX hardware until it is upgraded to Gigabit Ethernet.

Support for both speeds of SFPs allows organizations to stay within budget as they migrate to faster technologies.

High Network Resiliency

The IE300 Series supports highly stable and reliable network switching with a recovery time within 50ms. You can customize the IE300 with the most appropriate mechanism and protocol to prevent network connection failure. Choices include Allied Telesis Ethernet Protection Switched Ring (EPSRing™), and the standard ITU-T G.8032.

Configurable Power Budget

On the AT-IE300-12GP, you can configure the overall power budget and the power feeding limit on a per-port basis, to establish a close relationship between the power sourcing feature with the real capabilities of the external Power Supply Unit (PSU).*

* Power supply must be compliant with local/national safety and electrical code requirements. Select the supply with the most appropriated output power derating curve.

Key Features

- IEEE 802.3at PoE+ sourcing (30W)
- Hi-PoE sourcing (60W)
- High Availability Network Power (HANP) to retain PoE sourcing on hot-restart
- AlliedWare Plus™ functionalities
- Allied Telesis Management Framework™ (AMF) node
- USB port for image/configuration backup, restore, and upgrade
- Redundant power inputs for higher system reliability
- ACLs for traffic management
- Ethernet Protection Switched Ring (EPSRing™)
- Ethernet Ring Protection Switching (ITU-T G.8032)
- STP, RSTP, MSTP, and EPSR for better redundancy
- Superior security including SSL, SSH, 802.1X, MAC, IP filtering, RADIUS, TACACS+, and VLAN for access protection
- IPv6 management for up-to-date requirements
- Reliable and accurate QoS support
- Internal DC/DC electrical isolation
- Static routes
- Equal Cost Multi Path (ECMP) routing
- Route redistribution (OSPF, RIP)
- Static unicast and multicast routes for IPv4
- Active Fiber Monitoring™

Key Details

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. Powerful features like centralized management, auto-backup, auto-upgrade, auto-provisioning and auto-recovery enable plug-and-play networking and zero-touch management.
- Any IE300 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 on-site configuration is required.
- AMF Guestnode allows Allied Telesis wireless access points and switching products, as well as third party devices such as IP phones and security cameras, to be part of an AMF network.

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, you can choose to disable the port, disable the link, or send an SNMP trap. This feature can help to detect loops before a network storm occurs, avoiding the risk and inconvenience of traffic disruption.

Open Shortest Path First (OSPFv3)

- OSPF is a scalable and adaptive routing protocol for IP networks. The addition of OSPFv3 adds support for IPv6 and further strengthens the Allied Telesis focus on next generation networking.

Active Fiber Monitoring

- Active Fiber Monitoring 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.

Tri-authentication

- Authentication options on the IE300 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.

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.

Manageability

- BOOTP/DCHP and TFTP/FTP/SCP firmware upgrade; Command Line Interface (CLI); Web Graphical User Interface (GUI); SNMPv1/v2c/v3; hardware monitor for power supply presence and thermal; CPU protection by hardware watchdog.

High Availability

- EPSRing and ITU-T G.8032 for ring and chain topologies; Spanning-Tree protocol compatible; RSTP; MSTP; static Link Aggregation Group (LAG) and dynamic Link Aggregation Control Protocol (LACP) support.

Diagnostic

- LED indicators for power input, contact relays, and PoE+ abnormal operations; SNMP trap; alarm mail; Link Layer Discovery Protocol (LLDP); port mirror; and LLDP Media Endpoint Discovery (LLDP-MED) support.

VLAN

- 802.1Q VLAN; VLAN assignment based on per port; MAC; double tagging (Q-in-Q) for provider backbone network; GARP VLAN Registration Protocol (GVRP); Link Aggregation.

Quality of Service (QoS)

- Strict priority scheduling; 802.1p remarking; DSCP-to-CoS mapping; Weighted Round Robin.

Traffic filtering

- Static MAC filtering; Access Control List (ACL) filtering based on Ethernet or IP header, protected ports based on MAC.

Security

- 802.1X port-based authentication; auto IP-MAC; AAA (Authentication, Authorization, and Accounting) support; secure channel by SSL/SSH; SFTP (secure FTP).

Multicast

- IGMPv2/v3 snooping; MLDv1/v2 snooping.

PoE, PoE+ and Hi-PoE

- IE300 is a Power over Ethernet PoE Power Sourcing Device (PoE PSD) which is compliant with IEEE802.3af, IEEE802.3at standards. Each port provides either 15.40W PoE with 12.95W available to the powered device (IEEE802.3af, IEEE802.3at Type 1), or 30.00W PoE+ with 25.50W available to the powered device (IEEE802.3at Type 2). Four ports are configurable for Hi-PoE (also known as Ultra PoE, High PoE, PoE++, and others because there is no current standard), which uses all four pairs in the cable to provide up to 60W—double the capacity of PoE+. Practical use is to support PTZ cameras with heater/blowers for outdoor application, enhanced infrared lighting, lighting controller and LED lighting fixtures, Remote Point of Sale (POS) kiosks, network switches, as well as other devices.
- IE300 allows the configuration of the overall power budget and the power feeding limit on port basis; that establishes a close relationship between power sourcing feature with the real capabilities of the external PSU.

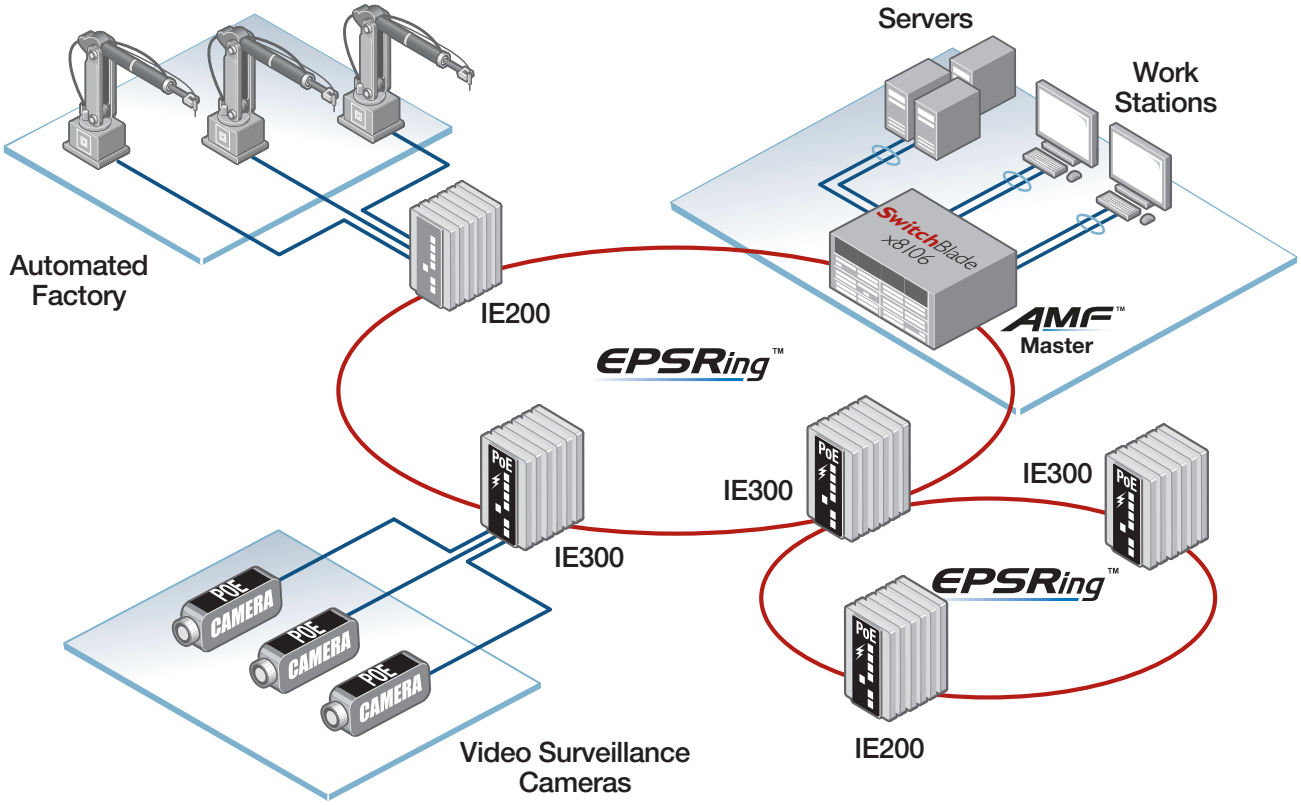
Others

- DHCP client/server; TACACS+; Simple Network Time Protocol (SNTP); Domain Name Service (DNS); DHCP snooping/relay.

premium software License

- By default, the IE300 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 premium software license.

Key Solutions



Ethernet Protection Switched Ring (EPSRing™) provides high speed resilient ring connectivity. This diagram shows the IE Series in a double ring network topology, serving different domains.

The IE Series operates at a large -40°C to +75°C temperature range and allows deployment in outdoor and harsh industrial environments.

PoE models feed 30 Watts per port and support remotely controlled pan, tilt and zoom (PTZ) video cameras.

The IE300 can source up to 60 Watts on four ports. The Hi-PoE utilizes all four pairs in the cable to provide power and expands the range of devices that can be added to the network, such as PTZ cameras with a heater/blower, enhanced infrared lighting, POS terminals, and thin client computer.

Management can be automated with the Allied Telesis Management Framework™ (AMF).

Specifications

MAC address	16K entries
Switching Bandwidth	24Gbps
Forwarding rate	17.8Mpps (64-byte packets)
Packet Buffer	1.5 MBytes (12.2 Gbits)
Priority Queues	8
Simultaneous VLANs	4K
VLANs ID range	1 – 4094
Jumbo frames	9KB jumbo packets
Multicast groups	1K (layer 2), 256 (layer 3)

Interface

I/O port	Gigabit Ethernet 10/100/1000T
Console port	RJ-45
F/W backup port	USB
Power connection	Terminal block

Power Characteristics

Voltage	12~55V DC (non-PoE models) 48V DC (PoE models, feeding 802.3at Type 1) 55V DC (PoE models, feeding 802.3at Type 2 & Hi-PoE)
Max. consumption	30W (non-PoE models) 320W (PoE models)*
Power connector	Terminal block

* The power consumption includes the full PoE+ load (240W); that may be limited via configuration.

Environmental Specifications

Operating temp.	-40°C to 75°C (-40°F to 167°F)
Storage temp.	-40°C to 85°C (-40°F to 185°F)
Operating humidity	5% to 95% non-condensing
Storage humidity	5% to 95% non-condensing

Environmental Compliance

RoHS
China RoHS
WEEE

Physical Characteristics

Dimensions (W x D x H)	14.6 cm x 12.7 cm x 15.2 cm (6.25 in x 5.28 in x 3.74 in)
Weight	2.0 kg (4.5 lb)
Enclosure	Aluminum shell
Protection class	IP30 – IP31 with additional cover tool
Installation	DIN rail or wall mount

Standards and Protocols

AlliedWare Plus Operating System

Version 5.4.6

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 Standards

IEEE 802.1AXLink aggregation (static and LACP)
IEEE 802.2 Logical Link Control (LLC)
IEEE 802.3 Ethernet
IEEE 802.3adStatic and dynamic link aggregation
IEEE 802.3af Power over Ethernet (PoE)
IEEE 802.3at Power over Ethernet plus (PoE+)
IEEE 802.3azEnergy Efficient Ethernet (EEE)
IEEE 802.3u 100BASE-X
IEEE 802.3x Flow control - full-duplex operation
IEEE 802.3z 1000BASE-X

IPv4 Standards

RFC 791 Internet Protocol (IP)
RFC 792 Internet Control Message Protocol (ICMP)
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 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 1812 Requirements for IPv4 routers
RFC 1918 IP addressing

IPv6 Standards

RFC 1981 Path MTU discovery for IPv6
RFC 2460 IPv6 specification
RFC 2464 Transmission of IPv6 packets over Ethernet networks
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 802.1ABLink 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 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

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-SM and 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

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
ITU-T G.8032 Ethernet ring protection switching

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
SSH remote login
SSLv2 and SSLv3
TACACS+ accounting and authentication
IEEE 802.1X authentication protocols (TLS, TTLS, PEAP, MD5)
IEEE 802.1X multi-supplicant authentication
IEEE 802.1X port-based network access control
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
RFC 5246 TLS v1.2

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 client
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
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

Mechanical
EN 50022, EN 60715 Standardized mounting on rails

Electrical/Mechanical Approvals

Compliance Mark	CE, FCC
Safety	EN/IEC/UL 60950-1 EN/IEC/UL 60950-22 CAN/CSA-22.2 no. 60950-1 CAN/CSA-22.2 no. 60950-22
EMC	CISPR 32 EN55024 EN55032 Class A EN61000-3-2 EN61000-3-3 EN61000-4-2 (ESD) EN61000-4-3 (RS) EN61000-4-4 (EFT) EN61000-4-5 (Surge) EN61000-4-6 (CS) EN61000-4-8 EN61000-4-11 FCC Part 15, Class A
Shock	EN60068-2-27 EN60068-2-31
Vibration	EN60068-2-6

Ordering Information

NAME	DESCRIPTION	INCLUDES
AT-FL-IE3-L2-01	IE300 series Layer-2 Premium license	▶ EPSR Master ▶ ITU-T G.8032 ▶ VLAN double tagging (QinQ) ▶ UDLD
AT-FL-IE3-L3-01	IE300 series Layer-3 Premium license	▶ OSPF ▶ OSPFv3 ▶ PIM-SM, DM and SSM ▶ PIMv6-SM and SSM ▶ RIP ▶ RIPng ▶ VRRP

Switches

AT-IE300-12GP-80
8x 10/100/1000T,
4x 100/1000X SFP,
Industrial Ethernet, Layer 3 Switch, Hi-PoE Support

AT-IE300-12GS-80*
12x 100/1000X SFP
Industrial Ethernet, Layer 3 Switch

AT-IE300-12GT-80
8x 10/100/1000T,
4x 100/1000X SFP,
Industrial Ethernet, Layer 3 Switch

Supported SFP Modules

Refer to the installation guide for the recommended Max. Operating Temperature according to the selected SFP module.

1Gbps SFP modules

AT-SPBD10-13
1000LX single-mode BiDi SFP, 10 km

AT-SPBD10-14
1000LX single-mode BiDi SFP, 10 km

AT-SPBD20-13/I
Small Form Pluggable, 20 km, industrial temperature

AT-SPBD20-14/I
Small Form Pluggable, 20 km, industrial temperature

AT-SPEX
1000X (LC) SFP, 2 km

AT-SPLX10
1000LX (LC) SFP, 10 km

AT-SPLX10/I
1000LX (LC) SFP, 10km, industrial temperature

AT-SPLX40
1000LX (LC) SFP, 40 km

AT-SPSX
1000SX (LC) SFP, 550 m

AT-SPSX/I
1000SX (LC) SFP, 550 m, industrial temperature

AT-SPTX
1000T SFP, 100 m

AT-SPZX80
1000ZX (LC) SFP, 80 km

100Mbps SFP modules

AT-SPFX/2
100FX (LC) SFP, 2 km

AT-SPFX/15
100FX (LC) SFP, 15 km

AT-SPFXBD-LC-13
100FX (LC) single-mode BiDi SFP, 15 km

AT-S PFXBD-LC-15
100FX (LC) single-mode BiDi SFP, 15 km

* Available in Q4 2016

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