IE340 Series

Industrial Ethernet Layer 3 Switches

Allied Telesis ruggedized IE340 Industrial Ethernet switches provide enduring performance in harsh environments, such as those found in manufacturing, transportation and physical security. Offering high throughput, rich functionality and advanced security features, IE340 switches deliver the performance and reliability demanded by deployments in the age of the Internet of Things (IoT).

PoE plus | AlliedWare Plus™ OPERATING SYSTEM | R6 READY

Overview

Allied Telesis IE340 Series are a high-performing and feature-rich choice for today's networks. The IE340 is ideal for Industrial Ethernet applications, being fully qualified for manufacturing, automation, process control, railway transportation (Telco & Signaling), roadway transportation (Traffic Control) and Smart Cities.

With a fanless design and a wide operating temperature range, IE340 switches tolerate the harsh and demanding environments found in industrial and outdoor deployments.

Modbus/TCP enables integration with existing factory management tools, and provides real-time automation in modular control and distributed systems.

Network management

Allied Telesis Autonomous Management Framework™ (AMF) meets the increasing management requirements of today's modern converged networks, by automating many everyday tasks such as configuration management. AMF's powerful features allow an entire network to be easily managed as a single virtual device.

Vista Manager™ EX is an intuitive visualization tool that complements the power of AMF. It allows users to monitor the network and quickly identify issues before they become major problems.

Securing the network edge

Ensuring data protection means controlling 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. This offers guests Internet access, while ensuring the integrity of private data.

Gigabit and Fast Ethernet

The IE340 Series SFP ports support both Gigabit and Fast Ethernet Small Form-Factor Pluggables (SFPs)[1]. This makes the IE340 Series ideal for environments where Gigabit fiber switches will be phased in over time, and allows for connectivity to the legacy 100FX hardware until it is upgraded to Gigabit Ethernet. Support for both speeds of SFP allows organizations to stay within budget as they migrate to faster technologies.

Network resiliency

The IE340 Series supports highly stable and reliable ICT network switching, with recovery times down to 50ms. Choices include Allied Telesis Ethernet Protection Switched Ring (EPSRing™), and the standards-based ITU-T G.8032 —Ethernet Ring Protection Switching (ERPS).

For high-availability automation networks based on Ethernet technology, the IE340 may run the may run the Media Redundancy Protocol (MRP) for a deterministic failover on ring topology.

Configurable PoE power budget and dynamic power allocation

On PoE-sourcing IE340 switches, the overall power budget can be configured to establish a close relationship between the power sourcing feature and the real capabilities of the external Power Supply Unit (PSU)[2]. PoE power is allocated dynamically, based on the current usage of each powered device.

Future-proof

The IE340 Series ensures a future-proof network with a comprehensive feature set, and is Software Defined Networking (SDN) ready, supporting OpenFlow v1.3.

Key Features

▶ AlliedWare Plus™

▶ Allied Telesis Autonomous Management Framework™ (AMF)

▶ OpenFlow for SDN

▶ Routing capability (ECMP, OSPF, RIP, Static and BGP)

▶ Active Fiber Monitoring™ (AFM)

▶ Industrial automation protocol support (Modbus/TCP)

▶ Ethernet Protection Switched Ring (EPSRing™)

▶ EPSR Master

▶ Ethernet Ring Protection Switching (ITU-T G.8032)

▶ High-availability automation network support (MRP)

▶ Upstream Forwarding Only (UFO)

▶ Precise time synchronization with sub-microsecond resolution (IEEE 1588 PTP)

▶ IEEE 802.3at PoE+ sourcing (30W)

▶ Dynamic PoE power allocation

▶ Continuous PoE

▶ Redundant power inputs

▶ Alarm input/output

▶ Protection circuits

▶ Alarm monitoring

▶ Enhanced Thermal Shutdown

▶ Fanless design

▶ Web-based GUI for easy management

[1] IE340L model does not support this feature.

[2] Power supply must be compliant with local/national safety and electrical code requirements. Select the supply with the most appropriate output power derating curve.

Key Features

Allied Telesis Autonomous Management Framework™ (AMF)

▶ 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.

▶ AMF secure mode encrypts all AMF traffic, provides unit and user authorization, and monitors network access to greatly enhance network security.

Software Defined Networking (SDN)

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

Resiliency

▶ EPSRing™ and ITU-T G.8032 ERPS enable a protected ring capable of recovery within as little as 50ms. These features are perfect for high performance and high availability.

▶ High-availability automation networks are achieved by means of de facto standards Media Redundancy Protocol (MRP) as defined by the IEC 62439-2; MRP is specified only for ring networks with up to 50 devices, and guarantees fully deterministic switchover behavior.

▶ Spanning Tree Protocol compatible. RSTP, MSTP, static Link Aggregation Group (LAG), and dynamic Link Aggregation Control Protocol (LACP) support.

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. Enjoy boosted network performance and guaranteed delivery of business-critical Ethernet services and applications. Time-critical services like voice and video applications take precedence over non-essential services like file downloads, maintaining responsiveness of Enterprise applications.

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 (up to 5 collectors can be configured) ensure it always has a real-time view of network traffic.

Active Fiber Monitoring (AFM)

▶ 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.

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 equipment, network policy, location discovery (for Emergency Call Services) and inventory.

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.

VLAN Translation

▶ VLAN Translation allows traffic arriving on a VLAN to be mapped to a different VLAN on the outgoing paired interface.

VLAN Access Control List (ACLs)

▶ ACLs simplify access and traffic control across entire segments of the network. They can be applied to a VLAN as well as a specific port.

Security (Tri-Authentication)

▶ Authentication options on the IE340 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.

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.

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.

Precise Time Synchronization With Sub-Microsecond Precision (IEEE 1588-2008 PTPv2)

▶ Measurement and automation systems involving multiple devices often require accurate timing in order to facilitate event synchronization and data correlation. The IEEE 1588 Precise Time Protocol is a fault tolerant method enabling clock synchronization in a distributed system that communicates using an Ethernet network; this deterministic communication network is designed to provide precise timing for automation applications and measurement systems.

▶ IE340 supports IEEE 1588-2008 (PTPv2) as Transparent Clock End-to-End mode, and performs an active role on Ethernet networks reducing the effects of Jitter.

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 IE340 series allows the configuration of the overall PoE power budget to match the real capabilities of the external Power Supply Unit (PSU). The PoE power budget is allocated automatically and dynamically, based on the current usage of each powered device.

▶ If the devices connected to a switch require more power than the switch is capable of delivering, the switch will deny power to some ports, according to the assigned priority.

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.

Industrial Automation

▶ Modbus/TCP is intended for supervision and control of automation equipment; that is a variant of the MODBUS protocol using the TCP/IP for communications on Ethernet networks.

▶ Modbus/TCP supports read/write register access and heartbeats functions to enhance the efficiency of the process control for both SCADA and slave devices.

Alarm Input/Output

▶ Alarm Input and Alarm Output are useful for security integration solutions. These respond to events instantly and automatically on a pre-defined event scheme, and send an alert message to the monitoring control center. The 2-pin terminal blocks may be connected to sensors and actuator relays. Alarm Input receives signals from external devices like motion sensors and magnets that will trigger subsequent actions if something changes. Alarm Output controls external devices upon an event, for example sirens, strobes and PTZ cameras.

Protection Circuits

▶ The IE340 series have optimized protection circuits to guard against the following abnormal conditions:
  - Reverse input voltage polarity
  - Over- and under-voltage
  - Over-current, peak-current and short-circuit
  - Over-temperature

Alarm Monitoring

▶ The IE340 series features the alarm facility to monitor the switch's environment and respond problem as they occur. Example of alarm events include:
  - Main power supply failure
  - Over-temperature
  - Port link down
  - Power requirements of all PoE powered devices exceed available power budget
  - PoE powered devices exceed individual port budget
  - External Alarm contact input

Key Features continued

Enhanced Thermal Shutdown

▶ The Enhanced Thermal Shutdown feature acts to restrict PoE power and services when the switch exceeds the safe operating temperature.

▶ The system restores operation when the temperature returns to acceptable levels.

Premium Software License

▶ By default, the IE340 Series offers a comprehensive Layer 2 and Layer 3 feature set that includes static routing and IPv6 management features. The feature set can easily be upgraded with premium software licenses.

Key Solutions
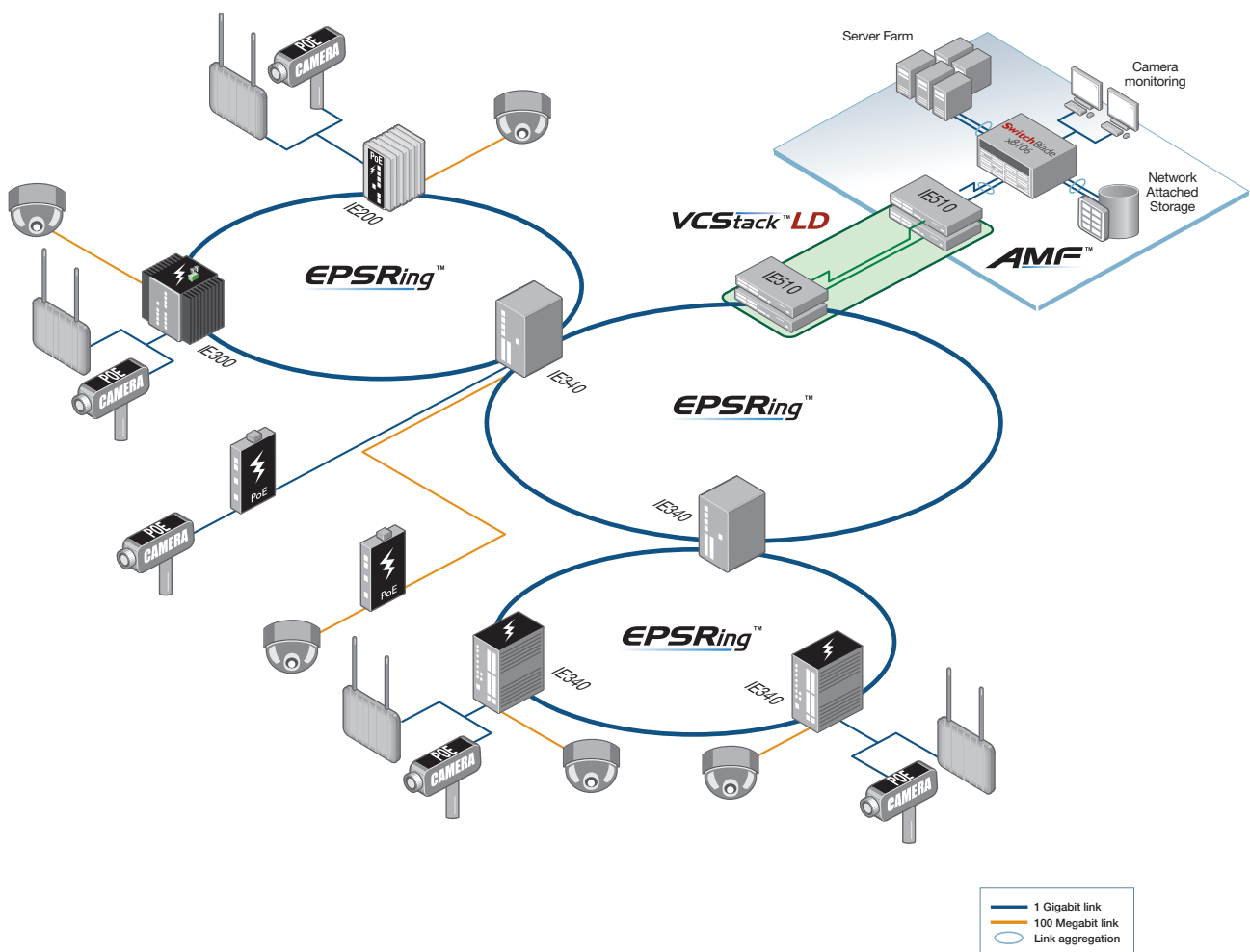
EPSRing™ and ITU-T G.8032 provide high-speed resilient ring connectivity. This diagram shows the IE Series in a double ring network topology.

The IE Series operates at a wide 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.

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

Specifications

PRODUCT	10/100/1000T (RJ-45) COPPER PORTS	100/1000X SFP PORTS	1000X SFP PORTS	TOTAL PORTS	POE ENABLED PORTS	SWITCHING FABRIC	FORWARDING RATE
IE340-12GP	8	4	-	12	8	24Gbps	17.8Mpps
IE340-12GT	8	4	-	12	-	24Gbps	17.8Mpps
IE340-20GP	16	4	-	20	16	40Gbps	29.7Mpps
IE340L-18GP	16	-	2	18	16	36Gbps	26.7Mpps

Performance

RAM memory	512MB DDR SDRAM
ROM memory	128MB flash
MAC address	16K entries
Packet Buffer	1.5 MBytes (12.2 Mbits)
Priority Queues	8
Simultaneous VLANs	4K
VLAN ID range	1–4094
Jumbo frames	9KB L2 jumbo frames
Multicast groups	511 (Layer 2), or 256 (Layer 2) and 256 (Layer 3)[3]

Other Interfaces

Type	Serial console (UART)
Port no.	1
Connector	RJ-45 female
Type	USB2.0 (Host Controller Class)
Port no.	1[4]
Connector	Type A receptacle
Type	Alarm input (320µA @3.3Vdc)
Port no.	1
Connector	2-pin Terminal Block
Type	Alarm output (0.5A @30Vdc)
Port no.	1
Connector	2-pin Terminal Block
Type	Power Input
Port no.	2
Connector	2-pin Terminal Block

Reliability

- Modular AlliedWare™ operating system
- Redundant power input
- Full environmental monitoring of temperature and internal voltages. SNMP traps alert network managers in case of any failure
- Enhanced Thermal Shutdown
- Protection circuits against abnormal operations

Flexibility and Compatibility

- Gigabit SFP ports supports any combination of Allied Telesis 10Mbps, 100Mbps and 1Gbps SFP modules listed in this document under Ordering Information

Industrial Automation

- IEEE 1588v2 1-step End-to-End Transparent Clock
- Modbus/TCP with master/slave earthbeats facility

Diagnostic Tools

- Active Fiber Monitoring detects tampering on optical links
- Automatic link flap detection and port shutdown
- Built-In Self Test (BIST)
- Cable fault locator (TDR)

- Connectivity Fault Management (CFM) - Continuity Check Protocol (CCP) for use with G.8032 ERPS
- Event logging via Syslog over IPv4
- Find-me device locator
- Optical Digital Diagnostic Monitoring (DDM)
- Ping polling for IPv4 and IPv6
- Port and VLAN mirroring (RSPAN)
- TraceRoute for IPv4 and IPv6
- UniDirectional Link Detection (UDLD)

IPv4 Features

- Black hole routing
- Directed broadcast forwarding
- DHCP server and relay
- DNS relay
- Equal Cost Multi Path (ECMP) routing
- Route redistribution (OSPF, RIP, and BGP)
- Static unicast and multicast routes for IPv4
- UDP broadcast helper (IP helper)

IPv6 Features

- DHCPv6 server and relay
- Device management over IPv6 networks with SNMPv6, Telnetv6 and SSHv6
- DNSv6 relay
- IPv4 and IPv6 dual stack
- IPv6 hardware ACLs
- NTPv6 client and server
- Static unicast routing for IPv6
- IPv6 Ready certified

Management

- Front panel LEDs provide at-a-glance PSU status, PoE status, and fault information
- Allied Telesis Autonomous Management Framework (AMF) node
- 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
- Built-in text editor
- Event-based triggers allow user-defined scripts to be executed upon selected system events
- SNMPv1/v2c/v3 support
- Comprehensive SNMP MIB support for standards based device management
- USB interface allows software release files, configurations and other files to be stored for backup and distribution to other devices[4]
- Recessed Reset button

Quality of Service

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

Resiliency Features

- Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic
- Dynamic link failover (host attach)
- Ethernet Protection Switching Ring (EPSR) with SuperLoop Prevention (EPSR-SLP)
- Ethernet Ring Protection Switching (G.8032 ERPS)
- Loop protection: loop detection and thrash limiting
- Media Redundancy Protocol (MRP)
- Multiple Spanning Tree Protocol (MSTP)
- PVST+ compatibility mode
- Router Redundancy Protocol (RRP) snooping
- Spanning Tree Protocol (STP) root guard

Security Features

- Access Control Lists (ACLs) based on Layer 3 and 4 headers
- Configurable ACLs for management traffic
- ACL Groups enable multiple hosts/ports to be included in a single ACL, reducing configuration
- Authentication, Authorization and Accounting (AAA)
- Auth fail and guest VLANs
- 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 lockdown
- Network Access and Control (NAC) features manage endpoint security
- Port-based learn limits (intrusion detection)

[3] When PIM is enabled

[4] IE340L model does not support this feature.

IE340 Series | Industrial Ethernet, Layer 3 Switches

- ► Private VLANs provide security and port isolation for multiple customers using the same VLAN
- ► RADIUS local server (100 users) and accounting
- ► Secure Copy (SCP)
- ► Strong password security and encryption
- ► TACACS+Authentication and Accounting
- ► Tri-authentication: MAC-based, web-based and IEEE 802.1X

Software Defined Networking
- ► OpenFlow v1.3 support

Environmental Specifications
- ► Operating temperature range:[5]

    IE340 model:
    -40°C to 75°C (-40°F to 167°F)[6]

    IE340L model:
    -40°C to 65°C (-40°F to 149°F)

- ► Storage temperature range:
    -40°C to 85°C (-40°F to 185°F)

- ► Operating humidity range:
    5% to 95% non-condensing

- ► Storage humidity range:
    5% to 90% non-condensing

- ► Operating altitude:
    3,000 meters maximum (9,843 ft)

Mechanical
- ► EN 50022, EN 60715 standardized mounting on rails

[5] Refer to the Installation Guide for more details on the safety approved power ratings and thermal conditions.

[6] 85°C (185°F) Dry heat endurance test performed for 48hrs.

[7] Test was applied using the power supply AT-IE048-480-20.

[8] Certification/test in progress.

COMPLIANCE	IE340	IE340L
Compliance Mark	CE, FCC, ICES, RCM, TEC[8], UL, VCCI	
Environmental Compliance	RoHS, China-RoHS, WEEE	
Safety[5]	AS/NZS 60950-1 AS/NZS 62368-1 CAN/CSA C22.2 No.60950-1 CAN/CSA C22.2 No.60950-22 CAN/CSA C22.2 No.61010-1 CAN/CSA C22.2 No.62368-1 EN/IEC/UL 61010-1 EN/IEC/UL 61010-2-201 EN/IEC/UL 60950-1 EN/IEC/UL 60950-22 EN/IEC/UL 62368-1	CAN/CSA C22.2 No.60950-1 CAN/CSA C22.2 No.60950-22 CAN/CSA C22.2 No.62368-1 EN/IEC/UL 60950-1 EN/IEC/UL 62368-1
Electromagnetic Immunity	EN 55024 EN 61000-6-2	
EN/IEC 61000-3-2 Harmonic current emission	✓[7]	
EN/IEC 61000-3-3 Voltage fluctuation and flicker	✓[7]	
EN/IEC 61000-4-2 Electrostatic discharge (ESD)	level 3	
EN/IEC 61000-4-3 Radiated susceptibility (RS)	level 3, level x (for EN 50121-4)	
EN/IEC 61000-4-4 Electrical fast transient (EFT)	Signal port: level 4 DC power port: level 3	
EN/IEC 61000-4-5 Lighting/surge immunity (Surge)	Signal port: level 3 (L-E) DC power port: level 3 (L-E, R-E), level 2 (L-L)	
EN/IEC 61000-4-6 Conducted immunity (CS)	level 3	
EN/IEC 61000-4-8 Magnetic field	level 4	
EN/IEC 61000-4-11 AC voltage dips and interruption	✓[7]	
EN/IEC 61000-4-29 DC voltage dips and Interruption	✓[8]	
Electromagnetic Emissions	AS/NZS CISPR 32, class A CISPR 11, group 1, class A CISPR 32, class A EN 55032, class A EN 61000-6-4, class A FCC 47 CFR Part 15, subpart B, class A ICES 003 issue 6, class A VCCI class A	
Industry		
EN 50121-4 Rail applications - S/T apparatus	✓	✓
EN/IEC 61131-2 Programmable controller	✓[8]	-
EN/IEC 61326-1 Measurement, control and laboratory use	✓	-
NEMA TS 2 Traffic controller assemblies	✓	✓
Freefall	IEC60068-2-31, class T2.3	
Shock	IEC60068-2-27 operational: 20g, 11ms, half-sine (DIN rail) 45g, 11ms, half-sine (wall mount) non-operational: 65g, 11ms, half-sine	
Vibration	IEC60068-2-6 operational: 2g @10~500Hz non-operational: 2g	

Physical Specifications

PRODUCT	WIDTH X DEPTH X HEIGHT	WEIGHT	ENCLOSURE	MOUNTING	PROTECTION RATE
IE340-12GP	91 x 139 x 153 mm (3.58 x 5.47 x 6.02 in)	DIN rail: 2.34 kg (5.16 lbs) Wall mount: 2.23 kg (4.91 lbs)	Aluminium/Sheet Metal shell	DIN rail, wall mount	IP30
IE340-12GT	91 x 139 x 153 mm (3.58 x 5.47 x 6.02 in)	DIN rail: 2.34 kg (5.16 lbs) Wall mount: 2.23 kg (4.91 lbs)	Aluminium/Sheet Metal shell	DIN rail, wall mount	IP30
IE340-20GP	91 x 139 x 153 mm (3.58 x 5.47 x 6.02 in)	DIN rail: 2.34 kg (5.16 lbs) Wall mount: 2.23 kg (4.91 lbs)	Aluminium/Sheet Metal shell	DIN rail, wall mount	IP30
IE340L-18GP	91 x 139 x 153 mm (3.58 x 5.47 x 6.02 in)	DIN rail: 2.34 kg (5.16 lbs) Wall mount: 2.23 kg (4.91 lbs)	Aluminium/Sheet Metal shell	DIN rail, wall mount	IP30

Power Characteristics

PRODUCT	INPUT VOLTAGE[9]	COOLING	NO POE LOAD			FULL POE LOAD[10]			MAX POE POWER	MAX POE SOURCING PORTS	
			MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE	MAX POWER CONSUMPTION	MAX HEAT DISSIPATION	NOISE		POE (15W)	POE+ (30W)
IE340-12GP	18~57V DC	fanless	24W	81.9 BTU/hr	-	271W	105.8 BTU/hr	-	240W	8	8
IE340-12GT	18~57V DC	fanless	24W	81.9 BTU/hr	-	-	-	-	-	-	-
IE340-20GP	18~57V DC	fanless	24W	81.9 BTU/hr	-	271W	105.8 BTU/hr	-	240W	16	8
IE340L-18GP	46~57V DC	fanless	24W	81.9 BTU/hr	-	271W	105.8 BTU/hr	-	240W	16	8

[9] PoE sourcing equipment require:
48Vdc to enable IEEE802.3at Type 1 (PoE)
54Vdc to enable IEEE802.3at Type 2 (PoE+)

[10] The Max Power consumption at full PoE load includes the powered device's consumption and margin. The cooling requirements of the switch are smaller than the power draw, because most of the load is dissipated at the PoE powered device and along the cabling. Use these wattage and BTU ratings for facility capacity planning.

Standards and Protocols

AlliedWare Plus Operating System
Version 5.5.1-2

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

Automation
Modbus/TCP
IEEE 1588-2008 Precision Clock Synchronization Protocol v2

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 2439   BGP route flap damping
RFC 2545   Use of BGP-4 multiprotocol extensions for IPv6 inter-domain routing
RFC 2918   Route refresh capability for 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 4760   Multiprotocol Extensions for BGP-4
RFC 5065   Autonomous system confederations for BGP
RFC 5492   Capabilities Advertisement with BGP-4
RFC 5925   The TCP Authentication Option
RFC 6793   BGP Support for Four-Octet Autonomous System (AS) Number Space
RFC 7606   Revised Error Handling for BGP UPDATE Messages

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
IEEE 802.2   Logical Link Control (LLC)
IEEE 802.3   Ethernet
IEEE 802.3ab   1000BASE-T
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 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 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 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-SM and SSM for IPv6
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 3590	Source Address Selection for the Multicast Listener Discovery (MLD) Protocol
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 4604	Using IGMPv3 and MLDv2 for source-specific multicast
RFC 4607	Source-specific multicast for IP
RFC 7761	Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol specification

Open Shortest Path First (OSPF)

OSPF link-local signaling
OSPF MD5 authentication
OSPF restart signaling
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

IEC 61439-2	Media Redundancy Protocol (MRP)
IEEE 802.3ad	Static and dynamic link aggregation
EEE 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)
ITU-T G.8023 / Y.1344	Ethernet Ring Protection Switching (ERPS)
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, 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 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 3579	RADIUS support for Extensible Authentication Protocol (EAP)
RFC 3580	IEEE 802.1x RADIUS usage guidelines
RFC 3748	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 5176	RADIUS CoA (Change of Authorization)
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	The TFTP protocol (revision 2)
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	Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
RFC 3396	Encoding Long Options in the Dynamic Host Configuration Protocol (DHCPv4)
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 4954	SMTP Service Extension for Authentication
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)

Voice VLAN
ANSI/TIA-1057 Link Layer Discovery Protocol-Media Endpoint Discovery (LLDP-MED)

Feature Licenses

NAME	DESCRIPTION	INCLUDES
AT-FL-IE34-CPOE	IE340 Series Continuous PoE license	▶ Continuous PoE
AT-FL-IE34-8032	IE340 Series G.8032 license	▶ ITU-T G.8032 ▶ Ethernet CFM
AT-FL-IE34-L2-1	IE340 Series Layer 2 Premium license	▶ EPSR Master ▶ VLAN Translation ▶ VLAN double tagging (QinQ)
AT-FL-IE34-L3-1	IE340 Series Layer 3 Premium license	▶ BGP (64 routes) ▶ BGP+ (64 routes) ▶ OSPF (64 routes) ▶ OSPFv3 (64 routes) ▶ PIM-SM, DM and SSM (256 routes) ▶ PIMv6-SM and SSM (256 routes) ▶ RIP (64 routes) ▶ RIPng (64 routes) ▶ VRRP and VRRPv3
AT-FL-IE34-MODB	IE340 Series Modbus/TCP license	▶ Modbus/TCP
AT-FL-IE34-MRP	IE340 Series MRP license	▶ Media Redundancy Protocol
AT-FL-IE34-OF13-1YR	IE340 Series OpenFlow license for 1 year	▶ OpenFlow v1.3
AT-FL-IE34-OF13-5YR	IE340 Series OpenFlow license for 5 years	▶ OpenFlow v1.3

IE340 Series | Industrial Ethernet, Layer 3 Switches

Ordering Information

Switches

The DIN rail and wall mount kits are included.
IE340L does not include the serial console cable.

AT-IE340-12GP-80
8x 10/100/1000T, 4x 100/1000X SFP,
Industrial Ethernet, Layer 3 Switch, PoE+ Support

AT-IE340-12GT-80
8x 10/100/1000T, 4x 100/1000X SFP,
Industrial Ethernet, Layer 3 Switch

AT-IE340-20GP-80
16x 10/100/1000T, 4x 100/1000X SFP,
Industrial Ethernet, Layer 3 Switch, PoE+ Support

AT-IE340L-18GP-80
16x 10/100/1000T, 2x 1000X SFP,
Industrial Ethernet, Layer 3 Switch, PoE+ Support

Power Supplies

AT-IE048-480-20
480W @48Vdc, Industrial AC/DC power supply,
DIN rail mount

AT-DRB50-48-1
50W @48Vdc, Industrial AC/DC power supply,
DIN rail mount

Supported SFP Modules

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

1000Mbps SFP Modules

AT-SPBD10-13
10 km, 1G BiDi SFP, LC, SMF, (1310 Tx/1490 Rx)

AT-SPBD10-14
10 km, 1G BiDi SFP, LC, SMF, (1490 Tx/1310 Rx)

AT-SPBD20-13/I
20 km, 1G BiDi SFP, SC, SMF, I-Temp,
(1310 Tx/1490 Rx)

AT-SPBD20-14/I
20 km, 1G BiDi SFP, SC, SMF, I-Temp,
(1490 Tx/1310 Rx)

AT-SPBD20LC/I-13
20 km, 1G BiDi SFP, LC, SMF, I-Temp,
(1310 Tx/1490 Rx)

AT-SPBD20LC/I-14
20 km, 1G BiDi SFP, LC, SMF, I-Temp,
(1490 Tx/1310 Rx)

AT-SPBD40-13/I
40 km, 1G BiDi SFP, LC, SMF, I-Temp,
(1310 Tx/1490 Rx)

AT-SPBD40-14/I
40 km, 1G BiDi SFP, LC, SMF, I-Temp,
(1490 Tx/ 1310 Rx)

AT-SPEX
2 km, 1000EX SFP, LC, MMF, 1310 nm

AT-SPEX/E
2 km, 1000EX SFP, LC, MMF, 1310 nm, Ext. Temp

AT-SPLX10/I
10 km, 1000LX SFP, LC, SMF, 1310 nm, I-Temp

AT-SPLX10/E
10 km, 1000LX SFP, LC, SMF, 1310 nm, Ext. Temp

AT-SPLX40
40 km, 1000LX SFP, LC, SMF, 1310 nm

AT-SPLX40/E
40 km, 1000LX SFP, LC, SMF, 1310 nm, Ext. Temp

AT-SPSX
550 m, 1000SX SFP, LC, MMF, 850 nm

AT-SPSX/I
550 m, 1000SX SFP, LC, MMF, 850 nm, I-Temp

AT-SPSX/E
550 m, 1000SX SFP, LC, MMF, 850 nm, Ext. Temp

AT-SPTX/I
100 m, 10/100/1000T SFP, RJ-45, I-Temp

AT-SPZX80[11]
80 km, 1000ZX SFP, LC, SMF, 1550 nm

AT-SPZX120/I
120 km, 1000LX SFP, LC, SMF, 1550 nm, I-Temp

100Mbps SFP modules[12]

AT-SPFX/2
2 km, 100FX SFP, LC, MMF, 1310 nm

AT-SPFX/15
15 km, 100FX SFP, LC, SMF, 1310 nm

AT-SPFXBD-LC-13
15 km, 100FX BiDi SFP, LC, SMF, (1310 Tx/1550 Rx)

AT-SPFXBD-LC-15
15 km, 100FX BiDi SFP, LC, SMF, (1550 Rx/1310 Tx)

Accessories

AT-VT-Kit3
Management cable (USB to serial console)

[11] Available in Japan only.

[12] IE340L model does not support this feature.

Allied Telesis™