Cisco Industrial Ethernet 3000 Layer 2/Layer 3 Series Switches

Product Overview

The Cisco® Industrial Ethernet 3000 Series (IE 3000 Series) is a family of Layer 2 and Layer 3 switches that bring Cisco's leadership in switching to Industrial Ethernet applications with Innovative features, robust security, and superior ease of use. The Cisco IE 3000 Series features:

- Industrial design and compliance

- Tools for easy deployment, management, and replacement

- Network security based on open standards

- Integration of IT and industrial automation networks

The Cisco IE 3000 Series is an ideal product for Industrial Ethernet applications, including factory automation, energy and process control, and intelligent transportation systems (ITSs).

The Cisco IE 3000 offers:

- Design for Industrial Ethernet applications, including extended environmental, shock/vibration, and surge ratings; a complete set of power input options; convection cooling; and DIN-rail or 19" rack mounting

- Support for Power over Ethernet (PoE) up to 15.4W per port

- Support for Power over Ethernet Plus (PoE+) for the PoE+ capable devices up to 30W per port

- Easy setup and management using the Cisco Device Manager web interface and supporting tools, including Cisco Network Assistant (CNA) and Cisco Prime LMS 4.2

- Easy switch replacement using removable memory, allowing the user to replace a switch without having to reconfigure

- High availability, guaranteed determinism, and reliable security using Cisco IOS® Software

- Recommended software configurations for industrial applications that can be applied at the touch of a button

- Compliance to a wide range of Industrial Ethernet specifications covering industrial automation, ITS, substation, railway, and other markets

- Support for IEEE1588v2, a precision timing protocol with nanosecond-level precision for high-performance applications

- Improved ring resiliency with the support of Resilient Ethernet Protocol (REP)

- Transparent IT integration with the support of Layer 3 routing protocols (IP Services)

- PROFINET v2 certification, with PROFINET conformance class B compliance

- ABB Industrial IT certification

Configurations

The Cisco IE 3000 Series software, based on Cisco IOS Software, is a rich suite of intelligent services, supporting high availability, quality of service (QoS), and security features.

The Cisco IE 3000 Series includes the following products:

Table 1.   Cisco IE 3000 Switches

Description	Specification
Cisco IE-3000-4TC	● 4 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has one active port either 10/100/1000 copper or SFP fiber ● Support up to two expansion modules with various combinations ● DC input range 18VDC-60VDC ● Layer 2 LAN Base Image
Cisco IE-3000-4TC-E	● Same as IE-3000-4TC with Layer 3 IP Services Image
Cisco IE-3000-8TC	● 8 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has one active port either 10/100/1000 copper or SFP fiber ● Support up to two expansion modules with various combinations ● DC input range 18VDC-60VDC ● Layer 2 LAN Base Image
Cisco IE-3000-8TC-E	● Same as IE-3000-8TC with Layer 3 IP Services Image
Cisco IEM-3000-8TM=	● Expansion copper Module for Cisco IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E, and IE-3000-8TC-E switches, eight 10/100 TX ports
Cisco IEM-3000-8FM=	● Expansion FX Fiber Module for Cisco IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E, and IE-3000-8TC-E switches, eight 100 FX ports

Description	Specification
Cisco PWR-IE50W-AC=	● Expansion Power Module for Cisco IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E and IE-3000-8TC-E switches, supports input AC 100-240V/1.25A or Input DC 125-250V/1A, Output DC 24V/2.1A, DIN-Rail Mount, compatible with PWR-IE3000-AC
Cisco PWR-IE50W-AC-IEC=	● Expansion Power Module for Cisco IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E and IE-3000-8TC-E switches, supports Input AC 100-240V/1.25A 50-60Hz, Output DC 24V/2.1A, IEC Plug, DIN-Rail Mount
Cisco IEM-3000-4SM=	● Expansion SFP Module for IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E, and IE-3000-8TC-E switches, 4 100MB SFP ports ● Minimum IOS release 15.0(2)EY
Cisco IEM-3000-8SM=	● Expansion SFP Module for IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E, and IE-3000-8TC-E switches, 8 100MB SFP ports ● Minimum IOS release 15.0(2)EY
Cisco IEM-3000-4PC=	● Expansion PoE module for IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E, and IE-3000-8TC-E switches, support 4 ports 10/100 PoE/PoE+. External power source is required (44-57 VDC for PoE/ 50-57 VDC for PoE+) ● Minimum IOS release 15.0(2)EY2
Cisco IEM-3000-4PC-4TC=	● Expansion PoE module for IE-3000-4TC, IE-3000-8TC, IE-3000-4TC-E, and IE-3000-8TC-E switches, support 4 ports 10/100 PoE/PoE+ and 4 ports non-PoE ports. External power source is required (44-57 VDC for PoE/ 50-57 VDC for PoE+) ● Minimum IOS release 15.0(2)EY2

Description	Specification
Cisco PWR-IE65W-PC-AC=	• AC-DC Power Module for PoE solution, Input AC 100-240V/1.4A, 50-60Hz or Input DC 125-250V/1A. Output 54VDC/1.2 A, DIN-Rail Mount
Cisco PWR-IE65W-PC-DC=	• DC-DC Power Module for PoE solution, Input DC 18-60 V/4.3A, Output DC 54V/1.2A, DIN-Rail Mount

Industrial Ethernet Applications

The new Cisco IE 3000 Series is an ideal product for a variety of Industrial Ethernet applications:

- **Industrial automation:** The Cisco IE 3000 is designed to support a wide array of Industrial Ethernet protocols for automation. The Cisco IE 3000 features a programmable logic controller (PLC) form-factor design with extended environmental ratings, convection cooling, DIN-rail mounting, redundant 24VDC power input, alarm relays, and surge/noise immunity. The Cisco IE 3000 software and configuration tools allow for easy setup, optimized for Industrial Ethernet applications (for example, EtherNet/IP). Multicast control, traffic prioritization, and security features are specified in default templates recommended for these protocols.

- **ITS:** The Cisco IE 3000 supports ITS and other applications for outdoor video and traffic or transportation systems control. The switch supports compliance to NEMA TS-2, a variety of gigabit fiber uplinks, and AC and DC power input options, while Cisco IOS Software supports critical ITS features, including virtual LAN (VLAN), QoS, Internet Group Management Protocol (IGMP) snooping, and security access control lists (ACLs).

- **Substations:** The Cisco IE 3000 is fully compliant to substation automation specifications, including IEC61850 and IEEE1613. The switch supports high-speed ring recovery; fiber access and uplink ports; AC, DC, and a variety of power input options for the substation environments.

- **Other applications:** The Cisco IE 3000 can be deployed in railway, military, Metro Ethernet, and other applications requiring unique environmental, form factor, or power inputs in harsh environments.

Table 2 gives the features and benefits of the Cisco IE 3000 Series. Table 3 gives the hardware specifications, and Table 4 gives the power specifications. Table 5 lists the management and standards support, and Table 6 provides the safety and compliance information.

Table 2. Features and Benefits of Cisco IE 3000 Series

Category	Feature/Benefit
Designed for industrial applications	● Extended temperature, vibration, shock and surge, and noise immunity ratings comply to specifications for automation, ITS, and substation environments ● Compact, PLC-style form factor is ideal for deployment in industrial environments ● DIN-rail, wall, and 19" rack mount options allow for deployments in a variety of control systems ● Variety of power input options covers a wide range of power requirements for Industrial Ethernet applications ● Up to 300 deployment configurations, supporting a range of access port densities, copper and fiber uplinks, fiber access ports, and power input, deliver flexibility in deployment ● Support for SFP modules provides uplink connectivity supporting 100BASE-LX, 100BASE-FX, 1000BASE-SX, 1000BASE-LX, and 1000BASE-ZX options ● Alarm relay contacts can be used for an external alert system
Ease of deployment, management, and replacement	● Cisco Express Setup simplifies initial configuration with a web browser, eliminating the need for more complex terminal emulation programs ● Cisco Smartports templates provide the option to apply a default global or interface-level macro with a recommended configuration, allowing the user to easily set up the switch in a configuration optimized for the specific application ● Smartports templates for EtherNet/IP provide an optimized setup for these Industrial Ethernet protocols at the touch of a button ● Swappable Flash memory is ideal for quick and easy switch replacement. Memory can be moved from one switch to another, so a switch can be replaced without the need to reconfigure software features ● The Cisco IE 3000 can be managed by PROFINET based management tools. The IE 3000 has PROFINET v2 certification, with PROFINET conformance class B compliance ● Simple Network Management Protocol (SNMP) (v1/v2/v3) support allows for management using traditional IT-based management tools, including CiscoWorks ● Device Manager allows web-based switch configurations ● DHCP port-based allocation retains the IP address on a per port basis and simplifies the end-host replacement in an industrial setting ● HTTPS access ● Embedded Event Manager (EEM) provides real-time network event detection and on board automation ● Cisco Network Assistant (CNA) is a no-charge, Windows-based application that simplifies the administration of networks of up to 250 users. It supports the Cisco IE 3000 and a wide range of Cisco Catalyst® intelligent switches. With CNA, users can manage Cisco Catalyst switches and launch the device managers of Cisco integrated services routers and Cisco Aironet® WLAN access points. Configuration wizards need just a few user inputs to automatically configure the switch to optimally handle different types of traffic: control, voice, video, multicast, and high-priority data. For detailed CNA support information, please go to http://www.cisco.com/en/US/products/ps5931/prod_release_notes_list.html ● Cisco Prime LMS support. For detailed information, please go to http://www.cisco.com/en/US/products/ps11200/products_device_support_tables_list.html
Availability and scalability	● Virtual LANs (VLANs) allow for logical segmentation for a network for optimal use of bandwidth ● 802.1q trunking ● QoS classifies and prioritizes data, guaranteeing determinism for mission-critical data ● IGMPv3 snooping provides fast client joins and leaves of multicast streams and limits bandwidth-intensive traffic to only the requestors. An additional querier allows this operation in a Layer 2 only environment ● IGMP filtering provides multicast authentication by filtering out no subscribers and limits the number of concurrent multicast streams available per port ● Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance ● IEEE 802.1d Spanning Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance ● EtherChannel LACP support for quick recovery and bandwidth utilization ● FlexLinks for fast recovery ● Cisco Hot Standby Router Protocol (HSRP) is supported to create redundant, failsafe routing topologies ● Resilient Ethernet Protocol, scalable up to 130 nodes with a very fast convergence, 50ms

Category	Feature/Benefit
Security	● IEEE 802.1x with VLAN assignment, guest VLAN, and voice VLAN allows dynamic port-based security, providing user authentication
	● Port-based ACLs for Layer 2 interfaces allow application of security policies on individual switch ports
	● MAC address filtering prevents the forwarding of any type of packet with a matching MAC address
	● Secure Shell (SSH) Protocol v2 and SNMPv3 provide network security by encrypting administrator traffic during Telnet and SNMP sessions. SSHv2 and the cryptographic version of SNMPv3 require a special cryptographic software image because of U.S. export restrictions
	● TACACS+ and RADIUS authentication enable centralized control of the switch and restrict unauthorized users from altering the configuration
	● MAC address notification allows administrators to be notified of users added to or removed from the network
	● Dynamic Host Configuration Protocol (DHCP) snooping allows administrators to help ensure consistent mapping of IP to MAC addresses. This can be used to prevent attacks that attempt to poison the DHCP binding database and to rate limit the amount of DHCP traffic that enters a switch port
	● DHCP Interface Tracker (Option 82) augments a host IP address request with the switch port ID
	● Port security secures the access to an access or 802.1q trunk port based on MAC address
	● After a specific time frame, the aging feature removes the MAC address from the switch to allow another device to connect to the same port
	● Trusted Boundary provides the ability to trust the QoS priority settings if an IP phone is present and to disable the trust setting if the IP phone is removed, thereby preventing a malicious user from overriding prioritization policies in the network
	● Up to 512 ACLs are supported, with two profiles: Security (384 Security ACL entries and 128 QoS policies) and QoS (128 Security ACL entries and 384 QoS polices)
	● Cisco standard and extended IP security router ACLs define security policies on routed interfaces for control-plane and data-plane traffic
	● Dynamic ARP Inspection helps ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol
	● DHCP Snooping prevents malicious users from spoofing a DHCP server and sending out bogus addresses. This feature is used by other primary security features to prevent a number of other attacks such as ARP poisoning
	● IP source guard prevents a malicious user from spoofing or taking over another user's IP address by creating a binding table between client's IP and MAC address, port, and VLAN
	● Support for private VLANs and SXP (SGT Exchange Protocol)
High-performance IP routing	● Inter-VLAN IP routing for full Layer 3 routing between 2 or more VLANs
	● Basic IP unicast routing protocols (static, Routing Information Protocol Version 1 [RIPv1], RIPv2 and RIPng)
	● Advanced IP unicast routing protocols (Open Shortest Path First [OSPF], Interior Gateway Routing Protocol [IGRP], Enhanced IGRP [EIGRP], Border Gateway Protocol Version 4 [BGPv4], and Intermediate System-to-Intermediate System [IS-IS]) are supported for load balancing and constructing scalable LANs
	● Protocol Independent Multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM-SM), PIM dense mode (PIM-DM), and PIM sparse-dense mode
	● Cisco Express Forwarding hardware routing architecture delivers extremely high-performance IP routing
	● IPv6 routing (OSPFv6 and EIGRPv6) support in hardware for maximum performance
	● Policy-based routing (PBR) allows superior control by facilitating flow redirection regardless of the routing protocol configured
	● HSRP provides dynamic load balancing and failover for routed links; up to 32 HSRP links supported per unit
	● Support for 1000 multicast groups
	● VRF-Lite virtualization

Table 3.   Cisco IE 3000 Series Switch Hardware

Description	Specification
Performance	● Wire-speed switching, 16 Gbps switching fabric ● Forwarding rate based on 64-byte packets: 6.5 Mpps ● 128 MB DRAM ● 64 MB Compact Flash memory ● Configurable up to 8000 MAC addresses (Layer 2) ● Configurable up to 2000 MAC addresses (Layer 3) ● Configurable up to 256 IGMP multicast groups (Layer 2) ● Configurable up to 1000 IGMP groups and multicast routes (Layer 3) ● Configurable up to 3,000 unicast routes (Layer 3) ● Support jumbo frames up to 9018 bytes on Gigabit uplink port and mini-jumbo frame (system MTU) up to 1998 bytes on both 10/100 and 10/100/1000 ports
Connectors and cabling	● 10BASE-T ports: RJ-45 connectors, two-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling ● 100BASE-TX ports: RJ-45 connectors, two-pair Category 5 UTP cabling ● 1000BASE-T ports: RJ-45 connectors, four-pair Category 5 UTP cabling ● 1000BASE-SX, -LX/LH, -ZX SFP-based ports: LC fiber connectors (single/multimode fiber) ● 100BASE-LX10, -FX: LC fiber connectors (single/multimode fiber)
Indicators	● Per-port status LED: Link integrity, disabled, activity, speed, full-duplex indications ● System-status LED: System, link status, link duplex, link speed, indications
Dimensions **(H x W x D)**	● Cisco IE-3000-4TC, Cisco IE-3000-4TC-E: 6.0" W x 5.8" H x 4.4" D (152mm W x 147mm H x 112mm D) ● Cisco IE-3000-8TC, Cisco IE-3000-8TC-E: 6.0" W x 5.8" H x 4.4" D (152mm W x 147mm H x 112mm D) ● Cisco IEM-3000-8TM=: 3.5" W x 5.8" H x 4.4" D (89mm W x 147mm H x 112mm D) ● Cisco IEM-3000-8FM=: 3.5" W x 5.8" H x 4.4" D (89mm W x 147mm H x 112mm D) ● Cisco IEM-3000-4SM=: 3.5" W x 5.8" H x 4.4" D (89mm W x 147mm H x 112mm D) ● Cisco IEM-3000-8SM=: 3.5" W x 5.8" H x 4.4" D (89mm W x 147mm H x 112mm D) ● Cisco IEM-3000-4PC=: 3.5" W x 5.8" H x 4.4" D (89mm W x 147mm H x 112mm D) ● Cisco IEM-3000-4PC-4TC=: 3.5" W x 5.8" H x 4.4" D (89mm W x 147mm H x 112mm D) ● Cisco PWR-IE50W-AC=: 2.0" W x 5.8" H x 4.4" D (51mm W x 147mm H x 112mm D) ● Cisco PWR-IE50W-AC-IEC=: 2.0" W x 5.8" H x 4.4" D (51mm W x 147mm H x 112mm D) ● Cisco PWR-IE65W-PC-AC=: 2.6" W x 5.9" H x 4.6" D (66mm W x 150mm H x 117mm D) ● Cisco PWR-IE65W-PC-DC=: 2.6" W x 5.9" H x 4.6" D (66mm W x 150mm H x 117mm D)
Weight	● Cisco IE-3000-4TC, Cisco IE-3000-4TC-E: 4.4 lb (2.0 kg) ● Cisco IE-3000-8TC, Cisco IE-3000-8TC-E: 4.4 lb (2.0 kg) ● Cisco IEM-3000-8TM=: 2.2 lb (1.0 kg) ● Cisco IEM-3000-8FM=: 3.2 lb (1.45 kg) ● Cisco IEM-3000-4SM=: 2.5 lb (1.1 Kg) ● Cisco IEM-3000-8SM=: 3.0 lb (1.38 Kg) ● Cisco IEM-3000-4PC=: 2.4 (1.08 Kg) ● Cisco IEM-3000-4PC-4TC=: 2.5 (1.16 Kg) ● Cisco PWR-IE50W-AC=: 1.4 lb (0.65 kg) ● Cisco PWR-IE50W-AC-IEC=: 1.4 lb (0.65kg) ● Cisco PWR-IE65W-PC-DC=: 2.6 (1.18 Kg) ● Cisco PWR-IE65W-PC-AC=: 2.7 (1.24 Kg)
Environmental ranges	● Operating temperature: -40 to 167ºF (-40 to 75ºC) ● Storage temperature: -40 to 185ºF (-40 to 85ºC) ● Operating relative humidity: 10 to 95% (non-condensing) ● Operating altitude: Up to 13,000 ft (3963m) ● Storage altitude: Up to 15,000 ft (4573m)

Description	Specification
Mean time between failure (MTBF)	• Cisco IE-3000-4TC, Cisco IE-3000-4TC-E: 363,942 • Cisco IE-3000-8TC, Cisco IE-3000-8TC-E: 329,451 • Cisco IEM-3000-8TM=: 926,999 • Cisco IEM-3000-8FM=: 264,689 • Cisco IEM-3000-4SM=: 8,887,990 • Cisco IEM-3000-8SM=: 7,732,890 • Cisco IEM-3000-4PC=: 1,494,990 • Cisco IEM-3000-4PC-4TC=: 1,291,440 • Cisco PWR-IE50W-AC=: 1,662,359 • Cisco PWR-IE50W-AC-IEC=: 1,662,359 • Cisco PWR-IE65W-PC-DC=: 2,468,430 • Cisco PWR-IE65W-PC-AC=: 2,488,401

Table 4. Power Specifications for Cisco IE3000 Series Switch

Description	Specification
Maximum power consumption	• Cisco IE-3000-4TC, Cisco IE-3000-4TC-E: 15.1W • Cisco IE-3000-8TC, Cisco IE-3000-8TC-E: 15.7W • Cisco IEM-3000-8TM=: 2.8W • Cisco IEM-3000-8FM=: 10.1W • Cisco IEM-3000-4SM=: 7.6W • Cisco IEM-3000-8SM=: 12.2W • Cisco IEM-3000-4PC=: 7.3W • Cisco IEM-3000-4PC-4TC=: 7.9W
Input voltage and currents supported	• Cisco IE-3000-4TC, Cisco IE-3000-8TC, 18-60VDC • Cisco IEM-3000-4PC=, IEM-3000-4PC-4TC=: 44-57V input • Cisco PWR-IE50W-AC=: 100-240VAC/1.25A or 125-250VDC/1A • Cisco PWR-IE50W-AC-IEC=: 100-240VAC/1.25A, 50-60Hz • Cisco PWR-IE65W-PC-DC=: 18-60VDC/4.3A • Cisco PWR-IE65W-PC-AC=: 100-240VAC/1.4A or 125-250V/1A
Power rating	• Cisco IE-3000-4TC, Cisco IE-3000-4TC-E: .05KVA • Cisco IE-3000-8TC, Cisco IE-3000-8TC-E: .05KVA

Table 5. SFP Transceivers Support for Cisco IE 3000 Series Switch

SFP Transceivers	Specification
Industrial Temperature 100-Megabit Transceivers	• GLC-FE-100FX-RGD 100BASE-FX, 2km/MMF • GLC-FE-100LX-RGD 100BASE-LX, 10km/SMF
Industrial Temperature Gigabit Uplink	• GLC-SX-MM-RGD 1000BASE-T^2, 220-550m/MMF • GLC-LX-SM-RGD 1000BASE-LX/LH 550m/MMF, 10km/SMF • GLC-ZX-SM-RGD 10000BASE-ZX 70-100km/SMF
Commercial Temperature 100-Megabit Transceivers	• GLC-FE-100FX 100BASE-FX, 2km/MMF • GLC-FE-100LX 100BASE-LX, 10km/SMF • GLC-FE-100EX 100BASE, 40km/SMF • GLC-FE-100ZX 100BASE, 80km/SMF • GLC-FE-100BX-D 10km/SMF • GLC-FE-100BX-U 10km/SMF

SFP Transceivers	Specification
Commercial Temperature Gigabit Uplink	● GLC-SX-MM 1000BASE-SX, 220-500m/MMF ● GLC-LH-SM 1000BASE-LH, 550m/MMF, 10km/SMF ● GLC-SX-MMD 1000BASE-SX, 220-500m/MMF, DOM ● GLC-LH-SMD 1000BASE-LH, 550m/MMF, 10km/SMF, DOM ● GLC-EX-SMD 1000BASE-EX, 40km, DOM ● GLC-ZX-SMD 1000BASE-ZX, 70-100km/SMF, DOM ● GLC-BX-D 1000BASE-BX10 10km/SMF ● GLC-BX-U 1000BASE-BX10 10km/SMF ● CWDM SFP 100km/SMF ● DWDM SFP ● GLC-T GE copper SFP transceiver

Table 6.   Compliance Specifications

Description	Specification
Standard safety certifications	● UL 60950-1 ● CSA C22.2 No. 60950-1 ● TUV/GS to EN 60950-1 ● CB to IEC 60950-1 with all country deviations ● NOM
Mechanical stability	● Shock 20g (operational), 30g (nonoperational)
Electromagnetic Emissions	● FCC Part 15 Class A ● EN 55022 ● CISPR 22 ● CISPR11 ● VCCI Class A ● AS/NZS 3548 Class A ● CNS 13438 Class A ● KN 22 Class A
Electromagnetic Immunity	● EN 55024 ● AS/NZS CISPR 24 ● KN 24 ● IEC/EN 61000-4-2 (Electro Static Discharge) ● IEC/EN 61000-4-3 (Radiated Immunity) ● IEC/EN 61000-4-4 (Fast Transients) ● IEC/EN 61000-4-5 (Surge) ● IEC/EN 61000-4-6 (Conducted Immunity) ● IEC/EN 61000-4-8 (Power Frequency Magnetic Field Immunity) ● IEC/EN 61000-4-9 (Pulse Magnetic Field Immunity) ● IEC/EN 61000-4-10 (Oscillatory Magnetic Field Immunity) ● IEC/EN 61000-4-11 (AC power Voltage Immunity) ● IEC/EN 61000-4-16 (Low Frequency Conducted CM Disturbances) ● IEC/EN 61000-4-17 (Ripple on DC Input Power) ● IEC/EN 61000-4-18 (Damped Oscillatory Wave) ● IEC/EN 61000-4-29 (Voltage Dips Immunity, DC power) ● IEEE C37.90 (Surge) ● IEEE C37.90.1 (Fast Transients) ● IEEE C37.90.2 (Radiated Immunity) ● IEEE C37.90.3 (Electro Static Discharge)

Description	Specification
Industry specifications	● EN 61131-2 Programmable Controllers (EMC/EMI, environmental, mechanical) ● IEEE 1613 Power Station and Substation Networking Devices ● IEC 61850-3 Power Station and Substation Communication Networks and Systems ● EN 61326-1 Electrical Equipment for Measurement, Control and Laboratory Use - EMC ● EN 61000-6-1 Immunity for Light Industrial Environments ● EN 61000-6-2 Immunity for Industrial Environments ● EN 61000-6-4 Emissions for Industrial Environments ● TS 61000-6-5 EMC Immunity for Power Station and Substation ● EN 50155 Railway, Electronic Equipment on Rolling Stock (EMI/EMC, environmental, mechanical) ● EN 50121-3-2 Railway, Electromagnetic Compatibility on Rolling Stock ● EN 50121-4 Railway, Emission and Immunity of Signaling and Telecommunications Apparatus ● EN 60945 Maritime Navigation and Radio-communication Equipment and Systems ● IEC 60533 Shipboard Electrical and Electronic Installation EMC ● Marine Type Approval (BV, DNV, Korean Register, Lloyd Register) ● NEMA TS-2 (EMC, environmental, mechanical) ● ABB Industrial IT certification ● ODVA Industrial EtherNet/IP support ● PROFINETv2 support ● Directive 2011/65/EU RoHS ● IP20
Hazardous locations	● UL/CSA 60079-0, -15 (Class 1, Div 2 A-D) (requires cabinet enclosure) ● EN 60079-0, -15 ATEX Certification (Class 1, Zone 2 A-D) (requires cabinet enclosure) ● IEC 60079-0, -15 (Test report only) (requires cabinet enclosure) ● UL 508 ● CSA C22.2 No. 142
Compliance Marking	● UL/CSA ● CE (Europe) ● C-Tick (Australia/New Zealand) ● KCC (Korea) ● ANATEL (Brazil) ● China RoHS
Operating Temperature	● -40 C to +70 C (vented enclosure operating) ● -40 C to +60 C (sealed enclosure operating) ● -34 C to +75 C (fan or blower-equipped enclosure operating) ● -40 C to +85 C (IEC Environmental Type Testing, 16 hours) ● Operational altitude: Up to 13,000 ft
Storage Temperature	● -40 C to +85 C (storage temperature) ● Storage altitude: Up to 15,000 ft
Humidity	● Relative humidity: 5% to 95% non-condensing
Telco	● Common Language Equipment Identifier (CLEI) code
Warranty	● Five year limited warranty

Service and Support

Cisco is committed to minimizing total cost of ownership (TCO). The company offers a portfolio of technical support services to help ensure that its products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The services and support programs described in Table 7 are available as part of the Cisco Desktop Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 7. Cisco Services and Support Programs

Service and Support	Features	Benefits
Advanced Services		
• Cisco Total Implementation Solutions (TIS), available direct from Cisco • Cisco Packaged TIS, available through resellers • Cisco SMARTnet® and SMARTnet Onsite support, available direct from Cisco • Cisco Packaged SMARTnet support program, available through resellers • Cisco SMB Support Assistant	• Project management • Site survey, configuration, and deployment • Installation, text, and cutover • Training • Major moves, adds, and changes • Design review and product staging • Access to software updates 24 hours • Web access to technical repositories • Telephone support through the Cisco Technical Assistance Center (TAC) • Advance replacement of hardware parts	• Supplements existing staff • Helps ensure that functions meet needs • Mitigates risk • Helps enable proactive or expedited issue resolution • Lowers TCO by taking advantage of Cisco expertise and knowledge • Minimizes network downtime

Ordering Information

Table 8 gives ordering information for the Cisco IE 3000 Series.

Table 8. Ordering Information for Cisco IE 3000 Series

Description	Specification
IE-3000-4TC	• Industrial Ethernet switch • 4 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • Each switch supports 2 Cisco modules, 1 Cisco IEM-3000-8FM= module, or 1 Cisco IEM-3000-8TM= module and 1 Cisco IEM-3000-8FM= module • Layer 2 LAN Base image installed
IE-3000-8TC	• Industrial Ethernet switch • 8 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • Each switch supports 2 Cisco IEM-3000-8TM= modules, 1 Cisco IEM-3000-8FM= module, or 1 Cisco IEM-3000-8TM= module and 1 Cisco IEM-3000-8FM= module • Layer 2 LAN Base image installed
IE-3000-4TC-E	• Industrial Ethernet switch • 4 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • Each switch supports 2 Cisco modules, 1 Cisco IEM-3000-8FM= module, or 1 Cisco IEM-3000-8TM= module and 1 Cisco IEM-3000-8FM= module • Layer 3 IP Services image installed
IE-3000-8TC-E	• Industrial Ethernet switch • 8 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • Each switch supports 2 Cisco IEM-3000-8TM= modules, 1 Cisco IEM-3000-8FM= module, or 1 Cisco IEM-3000-8TM= module and 1 Cisco IEM-3000-8FM= module • Layer 3 IP Services image installed
IEM-3000-8TM=	• Expansion Copper module for Cisco IE-3000-4TC and IE-3000-8TC switches • 8 10/100 TX ports
IEM-3000-8FM=	• Expansion Fiber module for Cisco IE-3000-4TC and IE-3000-8TC switches • 8 100 FX ports
IEM-3000-4SM=	• Expansion SFP module for Cisco IE-3000-4TC and IE-3000-8TC switches • 4 100M SFP ports
IEM-3000-8SM=	• Expansion SFP module for Cisco IE-3000-4TC and IE-3000-8TC switches • 8 100M SFP ports

Description	Specification
IEM-3000-4PC=	● Expansion PoE/PoE+ module for Cisco IE-3000-4TC and IE-3000-8TC switches ● 4 10/100 PoE/PoE+ ports ● External PoE power source (44-57 VDC for PoE/ 50-57 VDC for PoE+)
SIESISK9T-12252SE=	● LAN Base to IP Services Upgrade PID
IEM-3000-4PC-4TC=	● Expansion PoE/PoE+ module for Cisco IE-3000-4TC and IE-3000-8TC switches ● 4 non-PoE ports and 4 10/100 PoE/PoE+ ports ● External PoE power source (44-57 VDC for PoE/ 50-57 VDC for PoE+)
PWR-IE50W-AC=	● Expansion power module for IE-3000-4TC and IE-3000-8TC switches
PWR-IE50W-AC-IEC=	● Expansion power module for IE-3000-4TC and IE-3000-8TC switches
PWR-IE65W-PC-AC=	● AC-DC, 54VDC power module to support 65 watts for PoE/PoE+ modules
PWR-IE65W-PC-DC=	● DC-DC, 54VDC power module to support 65 watts for PoE/PoE+ modules
CAB-SM-LCSC-1M	● 1m-fiber single-mode LC-to-SC connectors
CAB-SM-LCSC-5M	● 5m-fiber single-mode LC-to-SC connectors
CF-IE3000=	● IE 3000 Compact Flash
PWR-IE3000-CLP=	● IE 3000 Power Transformer Spare connector clip
PWR-IE3000-CNCT=	● IE 3000 Power Spare connector
LPNL-IE3000=	● IE 3000 Left Panel Spare
RPNL-IE3000=	● IE 3000 Right Panel Spare
DINCLP-IE3000=	● Din-rail clip 4 pack Spare
BMP-IE3000=	● Din-rail clip bumper 4 pack Spare
STK-RACKMNT-2955=	● Din-rail adapter for rack mounting

For more information about Cisco products, contact:

- United States and Canada: 800 553-6387

- Europe: 32 2 778 4242

- Australia: 612 9935 4107

- Other: 408 526-7209

- URL: www.cisco.com

EDS-210A Series
8+2G/9+1G-port Gigabit unmanaged Ethernet switches

> Up to 2 Gigabit uplinks for high bandwidth data aggregation
> Multiple fiber ports with up to 4 100BaseSFP port combinations for maximum flexibility
> IP30 metal housing
> Redundant dual power input (12/24/48 VDC)
> -40 to 75°C operating temperature range (T models)

: Introduction

The EDS-210A series 10-port industrial Ethernet unmanaged switches provide up to 2 Gigabit Ethernet ports and are ideal for applications that require high-bandwidth data convergence. In particular, the EDS-210A-1GSFP-1SFP is equipped with 1 Gigabit fiber SFP slot, whereas the EDS-210A-1GTX-1GSFP-4SFP is equipped with 1 Gigabit fiber SFP slot and 1 Gigabit copper port.

The EDS-210A unmanaged switches are also equipped with multiple 100M ports, up to 4 100BaseSFP slots, and 8 100BaseTX copper ports for maximum flexibility in port combinations and long-distance communications.

The EDS-210A series provides 12/24/48 VDC redundant power inputs, rugged IP30-rated metal housing, DIN-rail mounting, and high level EMI/EMC capability. In addition to its compact size for space-saving installation, each EDS-210A has passed a 100% burn-in test to ensure its quality. Moreover, the EDS-210A series has an operating temperature range of -10 to the 60°C with wide temperature (-40 to 75°C) models also available.

All of these features make the EDS-210A ideal for applications that require high-bandwidth transmission and data converge for uplink, such as video surveillance, tolling systems, ITS, and factory automation.

: Specifications

Technology
Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3z for 1000BaseX
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface
EDS-210A-1GSFP-1SFP Series:
Fiber Ports: 100BaseSFP slot and 1000BaseSFP slot
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR1, PWR2, 100M (fiber port), 1000M (fiber port), 10/100M (TP port)
EDS-210A-1GTX-1GSFP-4SFP Series:
Fiber Ports: 100BaseSFP slot and 1000BaseSFP slot
RJ45 Ports: 10/100/1000 BaseT(X), 10/100BaseT(X) auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR1, PWR2, 100M (fiber port), 1000M (fiber port), 10/100M (TP port), 10/100/1000M (TP port)

Power Requirements
Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), redundant dual inputs
Input Current:
EDS-210A-1GSFP-1SFP: 0.45 A @ 24 V
EDS-210A-1GTX-1GSFP-4SFP: 0.45 A @ 24 V
Overload Current Protection: 3A
Connection: 2 removable 2-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics
Housing: Metal, IP30 protection
Dimensions:
45.8 x 134 x 105 mm (1.8 x 5.28 x 4.13 in)
Weight:
EDS-210A-1GSFP-1SFP: 520 g
EDS-210A-1GTX-1GSFP-4SFP: 570 g
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A

EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time:
EDS-210A-1GSF-1SFP: 2,469,233 hrs
EDS-210A-1GTX-1GSF-4SFP: 2,485,402 hrs
Database: Telcordia (Bellcore), GB
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

EDS-210A-1GSFP-1SFP   EDS-210A-1GTX-1GSFP-4SFP

Side View   Front View   Rear View   DIN Rail / Panel Mounting Kit

⋮ Ordering Information
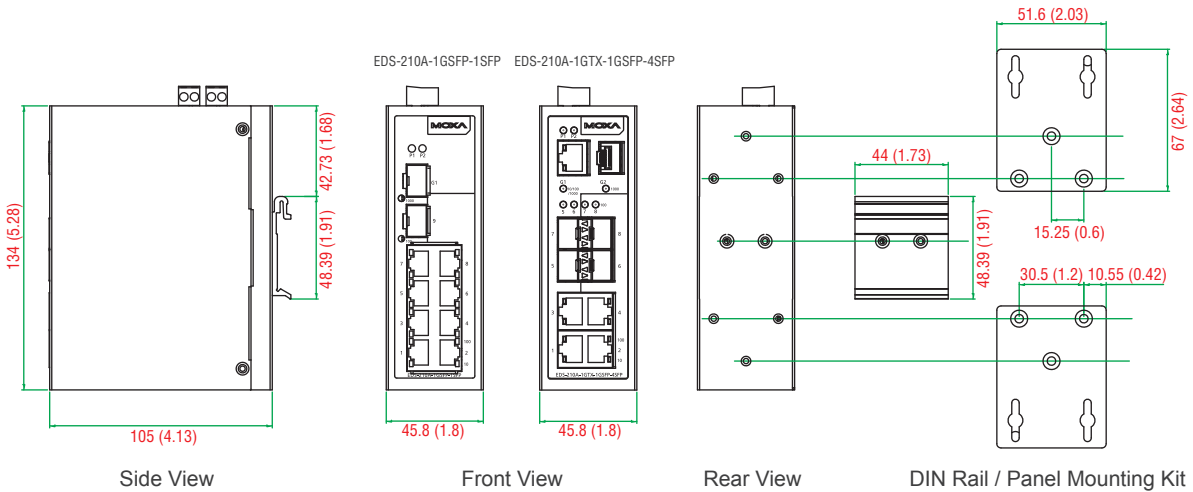
Available Models		Port Interface			
		Gigabit Ethernet		Fast Ethernet	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000 BaseT(X)	1000BaseSFP	100BaseSFP	10/100BaseT(X)
EDS-210A-1GSFP-1SFP	EDS-210A-1GSFP-1SFP-T	0	1	1	8
EDS-210A-1GTX-1GSFP-4SFP	EDS-210A-1GTX-1GSFP-4SFP-T	1	1	4	4

Note: The EDS-210A series supports 100BaseSFP and 1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist
- EDS-210A switch
- Hardware installation guide (printed)
- Warranty card

SFP-1G Series

1-port Gigabit Ethernet SFP modules

> IEEE 802.3z compliant
> Differential LVPECL inputs and outputs
> TTL signal detect indicator
> Hot pluggable LC duplex connector
> Class 1 laser product, complies with EN 60825-1

: Specifications

Interface
Ethernet Ports: 1
Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)
Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)
Note: When connecting long distance SFP (SFP-ZX, EZX or EZX-120), please ensure at least 5 dB attenuation between both ends. Without attenuation, excessive optical power may damage the transeivers.

Optical Fiber

	Gigabit Ethernet													
	SFP-SX	SFP-LSX	SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	1550 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	-2 dBm	1 dBm	5 dBm	5 dBm	3 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-8 dBm	-4 dBm	0 dBm	0 dBm	-2 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-30 dBm	-33 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	24 dB	30 dB	31 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m[a]	2 km[b]	10 km[c]	30 km[c]	40 km[c]	80 km[c]	110 km[c]	120 km[c]	10 km[c]		20 km[c]		40 km[c]	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-8 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 µm, 400 MHz-km or 62.5/125 µm, 500 MHz-km @ 850 nm multi-mode fiber optic cable
b. 62.5/125 µm, 750 MHz-km @ 1310 nm multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Note: The actual communication distance depends on many factors, including connector loss, cable deployment, and the age of the cabling system. We recommend doing a link budget analysis and reserving a 3 dB margin for such factors.

Environmental Limits
Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

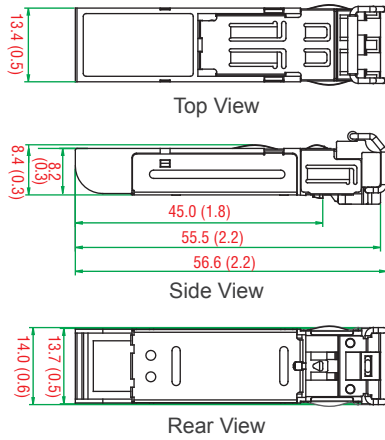### Standards and Certifications
Safety: UL 60950-1, TÜV

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)
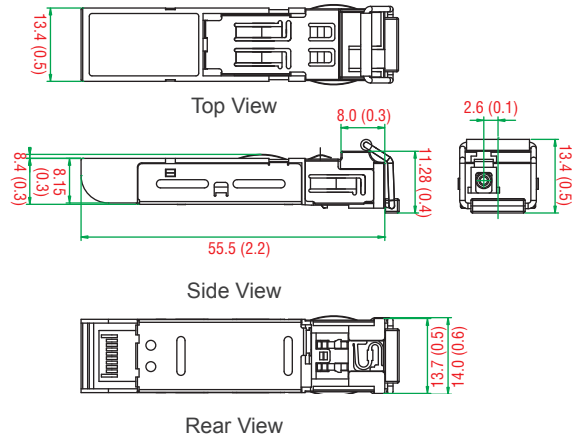
SFP-1G Series

Top View

Side View

Rear View

SFP-1G Series (WDM Type)

Top View

Side View

Rear View

Ordering Information

SFP Modules

Available Models		Port Interface							
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLH, LC Connector, 30 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZX, LC Connector, 110 km	1000BaseEZX, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	–	–	–	–	–	–	–
SFP-1GLSXLC	SFP-1GLSXLC-T	–	1	–	–	–	–	–	–
SFP-1GLXLC	SFP-1GLXLC-T	–	–	1	–	–	–	–	–
SFP-1GLHLC	SFP-1GLHLC-T	–	–	–	1	–	–	–	–
SFP-1GLHXLC	SFP-1GLHXLC-T	–	–	–	–	1	–	–	–
SFP-1GZXLC	SFP-1GZXLC-T	–	–	–	–	–	1	–	–
SFP-1GEZXLC	–	–	–	–	–	–	–	1	–
SFP-1GEZXLC-120	–	–	–	–	–	–	–	–	1

*SFP-1GSXLC-T: -20 to 75˚C operating temperature

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1	–	–	–	–	–
SFP-1G10BLC	SFP-1G10BLC-T	–	1	–	–	–	–
SFP-1G20ALC	SFP-1G20ALC-T	–	–	1	–	–	–
SFP-1G20BLC	SFP-1G20BLC-T	–	–	–	1	–	–
SFP-1G40ALC	SFP-1G40ALC-T	–	–	–	–	1	–
SFP-1G40BLC	SFP-1G40BLC-T	–	–	–	–	–	1

Available Models

The SFP-1G series modules can be used with the following products:
ICS-G7850A/G7852A series, ICS-G7850/G7852 series, ICS-G7750A/G7752A series, ICS-G7750/G7752 series, IM-G7000A-4GSFP, IM-G7000-4GSFP, ICS-G7826A/G7828A series, ICS-G7826/G7828 series, ICS-G7526A/G7528A series, ICS-G7526/G7528 series, IKS-G6524A/G6824A series, IKS-G6524/G6824 series, IKS-6726A/6728A series, IKS-6726/6728 series, IM-2GSFP, EDS-611/619 series, EDS-G516E series, EDS-G512E series, EDS-G509 series, EDS-518A series, EDS-510A series, EDS-510E series, EDS-G308 series, EDS-210A series, IKS-6728A-8PoE series, IKS-6728-8PoE series, EDS-P510A-8PoE series, EDS-P510 series, EDS-G205A-4PoE series, PM-7200-2G/4G series, PT-G7509 series, IMC-101G series, EDR-G903/G902 series, EDR-810 series

Package Checklist

- SFP-1G module
- Warranty card

SFP-1FE Series

1-port Fast Ethernet SFP modules

> IEEE 802.3u compliant
> Differential PECL inputs and outputs
> TTL signal detect indicator
> Hot pluggable LC duplex connector
> Class 1 laser product; complies with EN 60825-1

EN : 60825

c RU US

: Specifications

Interface
Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

	Fast Ethernet		
	SFP-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-8 dBm	0 dBm	0 dBm
Min. TX	-18 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km [a]	40 km [b]	80 km [b]
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 µm or 62.5/125 µm, 800 MHz * km @ 1300 nm
multi-mode fiber optic cable
b. 9/125 µm single-mode fiber optic cable

Environmental Limits
Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

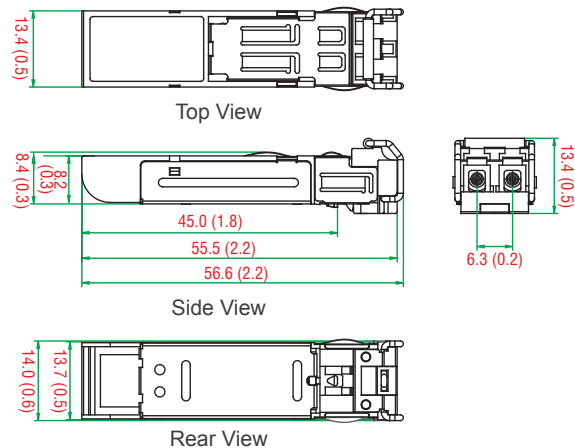### Standards and Certifications
Safety: UL 60950-1, TÜV

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

13.4 (0.5)

Top View

8.4 (0.3) 8.2 (0.3)

45.0 (1.8)
55.5 (2.2)
56.6 (2.2)

Side View

13.4 (0.5)

6.3 (0.2)

14.0 (0.6) 13.7 (0.5)

Rear View

: Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85˚C)	100BaseFX, Multi-mode, LC Connector, 4 km	100BaseFX, Single-mode, LC Connector, 40 km	100BaseFX, Single-mode, LC Connector, 80 km
SFP-1FEMLC-T	1	–	–
SFP-1FESLC-T	–	1	–
SFP-1FELLC-T	–	–	1

Available Models
The SFP-1FE series modules can be used with the following products:
IM-G7000A-4GSFP, IM-G7000-4GSFP, ICS-G7826A/ G7828A series, ICS-G7826/G7828 series, ICS-G7526A/G7528A series, ICS-G7526/G7528 series, IKS-G6524A/G6824A series, IKS-G6524/G6824 series, IKS-6726A/6728A series, IKS-6726/6728 series, IM-6700A-8SFP, IM-6700-8SFP, EDS-611/619 series, EDS-G516E series, EDS-G512E series, EDS-G509 series, EDS-510E series , EDS-G308-2SFP, EDS-210A series, IKS-6728A-8PoE series, IKS-6728-8PoE series, EDS-P510A-8PoE series, EDS-P510 series, PM-7200-8SFP, EDR-G903/G902 series

Package Checklist
- SFP-1FE module
- Warranty card