# Cisco Industrial Ethernet 2000 IP67 Series Switch

## Product Overview

The Cisco® Industrial Ethernet (IE) 2000 IP67 Series is Cisco's first ruggedized switching platform that complies with the most demanding IP67 industrial standards. It also provides everything you've come to expect from the global leader in Internet Protocol (IP) networking: easy integration with the rest of your network, reliability, rock-solid performance, and world-class support. Now, those advantages and Cisco IOS® Software features extend all the way to the factory floor, rail yard, or other industrial site, even in the harshest environments. So you can finally fulfill the promise of network convergence-across both information technology (IT) and operations technology (OT) environments-with one supplier.

## Features and Benefits

The Cisco IE 2000 IP67 Series is purpose-built for manufacturing, automotive, oil and gas, mining, transportation, and other industrial work sites. It can be wall-mounted and requires no cabinet housing.

Table 1 summarizes and describes the IE 2000 IP67 Series' primary features.

**Table 1.**     IE 2000 IP67 Product Highlights

| Feature | Description/Benefit(s) |
|---|---|
| Certified IP67 rating | The solution is IP67-rated to protect against dust and submersion in water. It meets the most rigorous industrial and safety standards for extreme temperature and vibration, humidity, electromagnetic emissions, and other factors. |
| Compliant with industrial automation standards | The rugged switch supports EtherNet/IP (CIP) and PROFINET so you can easily integrate it with any Ethernet-based industrial equipment and management system. It also supports PrecisionTime Protocol (PTP) v2 for demanding synchronized applications. |
| Easy deployment | With zero-touch discovery using Dynamic Host Control Protocol (DHCP), express setup, and sub-60-second boot-up times, you can easily migrate to all-IP-over-Ethernet networking environment. |
| Strong endpoint security | Support for the following:<br>• 802.1x<br>• Port security<br>• Dynamic port-based authentication using DHCP<br>• Encrypted administrative traffic<br>• Centralized authentication |
| Resiliency | Cisco brings recovery mechanisms such as flex links and Cisco Resilient Ethernet Protocol (REP) to the factory floor or other industrial site. Profinet MRP ring provides the open standard industrial resiliency. |
| Manageability | The solution is easy for operations staff to configure and manage. Cisco Auto Smart Port lets you configure the right quality of service (QoS) settings for any port in seconds. It also allows for secure web-based administration and easy integration with your network management system. |
| Network address translation (NAT) | The switches provide line-rate, hardware-enabled static address translation to easily connect complex Layer-2/machine node networks. |
| Industrial power-over-Ethernet (PoE) | Select switch models let you connect and power endpoints with a single cable in compliance with PoE and PoE+ standards. |
| Removable SD Flash memory | With tightly secured swappable hard drives, you can quickly replace switches in the field with minimal disruption. |
| Platform flexibility | The Cisco IE2000 IP67 Series is available with 8, 16, or 24 10/100Base-T, fixed-configuration Ethernet ports and 2x Gigabit Ethernet ports. It provides M12 D Coded, X Coded, and a mini-change dual-power connector in an industrial-hardened, wall-mountable form factor. |

## Switch Performance and Scalability

- Line rate/nonblocking uplink/downlink ports
- Forwarding rate: 6.5 mpps with 64-byte packets
- Egress buffer: 2 MB
- Unicast MAC addresses: 8000
- Internet Group Management Protocol (IGMP) multicast groups: 255
- Max VLANs: 1005
- IPv4 MAC security ACEs: 384 (default TCAM template)
- Bidirectional, 128 NAT entries

## Switch Models and Configurations

Figure 1 shows switch models, and Table 2 shows Cisco IE 2000 Series configuration information.

**Figure 1.**    Industrial Ethernet 2000 IP67 Series



IE2000-8T67-B    IE2000-8T67-P-G-E    IE2000-16T67-B    IE2000-16T67P-G-E    IE2000-24T67-B

**Table 2.**    Industrial Ethernet 2000 IP67 Series

| PID | Total Ports | 100 MB D-Code | GE X-Code Ports | Manufacturing License | IEEE1588 | NAT | PoE(+) |
|-----|-------------|---------------|-----------------|----------------------|----------|-----|--------|
| IE-2000-8T67-B | 8 | 8 | | LAN Base | | | |
| IE-2000-16T67-B | 16 | 16 | | LAN Base | | | |
| IE-2000-24T67-B | 24 | 24 | | LAN Base | | | |
| IE-2000-8T67P-G-E | 10 | 8 | 2 GE | LAN Enhanced | X | X[**] | X |
| IE-2000-16T67P-G-E | 18 | 16 | 2 GE | LAN Enhanced | X | X[**] | X |

[**] Requires LAN Base to LAN Enhanced image (enables L2 NAT)

**Table 3.**    Power Supply, License Upgrade, and Additional Parts

| Product Number | Description |
|----------------|-------------|
| PWR-IE160W-67-DC= | IP67-rated PoE DC-DC power supply, Input:18V-60V Output: 54V, 3.1A max 160Watts |
| PWR-IE180W-67-AC= | IP67-rated PoE AC-DC power supply, input 85-264VAC/88-300VDC, Output 54V, 3.1A max, 180Watts |
| SD-IE-1GB | 1GB SD Memory Card |
| IE2000-B-E= | IE2000 LAN Base to Enhanced LAN Base Paper NAT License to Enable NAT Capability |
| LIC-MRP-MANAGER= | MRP ring Manager license |
| LIC-MRP-Client= | MRP ring Client license |
| LIC-IE2000-IP-L= | Field upgradable IE2000 LAN Base to IP Lite license |
| CAB-CONSOLE-M12= | Console Cable 6ft with M12 and DB9F for IE2000IP67 Switch |

**Table 4.** Product Specifications

| Description | Specification |
|---|---|
| **Hardware** | • 256MB DRAM with ECC memory<br>• IEEE 1588v2 FPGA<br>• 64MB on-board flash memory<br>• 1GB removable SD flash memory card (optional) |
| **Alarm** | • Alarm-one alarm output relay using an M12 A Coded 5 Pin connector (Max. rated: 24VDC @ 1A/48VDC @ 0.5A) |
| **Input Voltage Supported** | • IE-2000-8T67-B, IE-2000-16T67-B, IE-2000-24T67-B: 9.6-60VDC<br>• IE-2000-8T67P-G-E, IE-2000-16T67P-G-E, with PoE: 44-57VDC, with PoE+ 50-57VDC<br>• PWR-IE160W-67-DC=: 18-60VDC, 12A |
| **Power Rating** | • IE-2000-8T67-B: 0.023KVA<br>• IE-2000-16T67-B: 0.027KVA<br>• IE-2000-24T67-B: 0.03 KVA<br>• 8 port PoE (4 Port PoE) model: 0.12KVA<br>• 16 port PoE (8 port PoE) model: 0.2 KVA |
| **Power Consumption** | • IE-2000-8T67-B: 7-17W<br>• IE-2000-16T67-B: 10-20W<br>• IE-2000-24T67-B: 12-22W<br>• 8-port PoE (4 Port PoE/4 Port PoE+) model: 73-84W<br>• 16 port PoE (4 Port PoE+/8-port PoE) model: 137-150W |
| **Connectors and Cabling** | **Data Cable**<br>• Copper 100 Base-T M12 D coded 4-pole (pin) cable connector<br>• Copper GE M12 X coded-8-pole (pin)-cable connector<br>**Alarm Cable**<br>• M12 A-Coded 5-Pin Cable<br>**Console Cable**<br>• M12 A Coded 5-Pin connector<br>**Power Supply Cables**<br>• Power cable for power source, Mini-Change A-Size single-ended cord set, 4 poles, female to pigtail, 16 AWG PVC cable. Molex part#130006-0737<br>http://www.molex.com/customer.html?supplierPN=1300060737<br>• Power cable to IE2000 IP67 switch: Mini-Change A-size double-Ended Cordset, 4 poles male to female. 16 AWG, TPE cable. Molex Part #130010-0863<br>http://www.molex.com/customer.html?supplierPN=1300100863<br>• Power cable for AC-DC power source, Mini-change A-size single-ended cord set, 3 pins, female insert on one end to pigtail, 16 AWG PVC cable, Molex part# 130006-2419<br>http://www.molex.com/customer.html?supplierPN=1300062419<br>• Power cord from power source to power supply: 2 hole female power cord to open for input DC connector.<br>http://www.molex.com/customer.html?supplierPN=1300062419 |
| **Dimensions (H x W x D)** | • IE-2000-8T67-B & IE-2000-8T67P-G-E 8 ports chassis': 9.5" x 9.32" x 3.9" (241.7 x 236.7 x 99 mm)<br>• IE-2000-16T67-B & IE-2000-16T67P-G-E16 ports chassis': 9.5" x 11.84" x 3.2" (241.7 x 300.7 x 81.5 mm)<br>• IE-2000-24T67-B 24 ports chassis: 9.5" x 14.76" x 3.2" (241.7 x 374.8 x 81.5 mm)<br>• PWR-IE160W-67-DC: 8.7" x 9.1" x 3.8" (222.2 x 231.7 x 97 mm)<br>• PWR-IE180W-67-AC: 8.7" x 9.1" x 3.8" (222.2 x 231.7 x 97 mm) |
| **Weight** | • IE-2000 IP67 8 ports (both models; PoE and non-PoE): 7.19 lbs. (3.26 kg)<br>• IE-2000 IP67 16 ports (both models; PoE and non-PoE): 7.28 lbs. (3.30 kg)<br>• IE-2000 IP67 24 ports: 8.86 lbs. (4.02 kg)<br>• PWR-IE160W-67-DC: 5.2 lbs. (2.36 kg)<br>• PWR-IE180W-67-AC: 5.2 lbs. (2.36 kg) |

**Table 5.**   Cisco IE 2000 Software Features

| LAN Base License (Default) | Features |
|---|---|
| Layer 2 Switching | IEEE 802.1, 802.3, 802.3at, 802.3af standard (see Table 6), VTPv2, NTP, UDLD, CDP, LLDP, Unicast MAC filter, Flex Link, REP, VTPv3, EtherChannel, Voice VLAN |
| Security | SCP, SSH, SNMPv3, TACACS+, RADIUS Server/Client, MAC Address Notification, BPDU Guard, SPAN session (1), Port-Security, DHCP Snooping, Dynamic ARP Inspection, IP Source Guard, 802.1x, Guest VLAN, MAC Authentication Bypass, 802.1x Multi-Domain Authentication, Storm Control, Trust Boundary |
| Multicast | IGMPv1, v2, v3 Snooping, IGMP filtering, IGMP Querier |
| QoS | IPv4 Ingress Policing, Rate-Limiting, Egress Queuing/Shaping, AutoQoS |
| Management | Fast Boot, Express Setup, Web Device Manager, CNA, Cisco Prime, LMS, MIB, SmartPort, SNMP, syslog, Port-Based DHCP, Storm Control-Unicast, Multicast, Broadcast, SPAN Sessions (2), RSPAN, DHCP Server, Customized TCAM/SDM Size Configuration |
| Industrial Ethernet | Ethernet/IP, Profinet, Profinet MRP, IEEE 1588 PTPv2 |
| IPv4 Routing | IPv4 static routing |
| IPv6 Routing | IPv6 host support, HTTP over IPv6, SNMP over IPv6 |

| Enhanced LAN Base | Features |
|---|---|
| Industrial Management | Layer 2 Switching with 1:1 static NAT |
| **IP Lite License** | **Features** |
| IPv4 Routing | RIP, OSPF, EIGRP, VRF Lite |
| IPv6 Routing | IPv6 Static routing, OSPFv3 |
| Embedded Event Manager | EEM feature enabled with IP Lite License |

**Table 6.**   Compliance Specifications

| Description | Specification |
|---|---|
| Safety Certifications | • UL/CSA 60950-1<br>• EN 60950-1<br>• CB to IEC 60950-1 with all country deviations<br>• NOM to NOM-019-SCFI (through partners and distributor)<br>• CCC (for power supply only) (Pending) |
| Industrial (Control Equipment) Floor | • UL 508<br>• CSA C22.2, No 142<br>• CSA C22, 2 No 107.1 (for Power Supply Only) |
| Operating Environment | • Operating Temperature: -40C to +60C<br>• EN 60068-2-1<br>• EN 60068-2-2<br>• EN 61163<br>• Altitude: Up to 13,800 feet or 4,200 meters |
| EMC Emissions and Immunity Compliance | • FCC 47 CFR Part 15 Class A<br>• EN 55011<br>• EN 55022A Class A<br>• VCCI Class A<br>• AS/NZS CISPR 22 Class A<br>• CISPR 11 Class A<br>• CISPR 22 Class A<br>• ICES 003 Class A<br>• CNS13438 Class A<br>• KN22<br>• EN55024<br>• CISPR 24<br>• AS/NZS CISPR 24 |

| Description | Specification |
|---|---|
| | • KN24<br>• Brazil ANATEL certification<br>• EN 61000-4-2 Electro Static Discharge<br>• EN 61000-4-3 Radiated RF<br>• EN 61000-4-4 Electromagnetic Fast Transients<br>• EN 61000-4-5 Surge<br>• EN 61000-4-6 Conducted RF<br>• EN 61000-4-8 Power Frequency Magnetic Field<br>• EN 61000-4-9 Pulse Magnetic Field<br>• EN 61000-4-10 Oscillatory Magnetic Field<br>• EN-61000-4-29 DC Power Voltage Dips and Immunity |
| Shock and Vibration | • IEC 60068-2-6 Vibration: IEC 60068-2-6, IEC 255 21.1 Class 1 Vibration Test<br>• IEC 60068-2-27 (Shock)<br>• IEC 60068-2-31 (Shock)<br>• IEC 60068-2-32 (Shock)<br>• IEC 60068-2-64 (Vibration)<br>• EN 61373 Cat 1 Class B (Shock and Vibration) |
| Industry Standards | • EN 61000-6-2 Industrial<br>• EN 61000-6-4 Industrial<br>• EN 61000-6-1 Light Industrial<br>• EN 61326 Industrial Control<br>• EN 61131-2 Programmable Controllers<br>• Marine (DnV) ENV3 (Pending)<br>• EN 60945 Maritime navigation and radio equipment and systems (Pending)<br>• IEEE 1613 Electric Power Stations Communications Networking (Pending)<br>• IEC 61850-3 Electric Substations Communications Networking (Pending)<br>• EN 50155 Railway-Electronic Equipment on Rolling Stock<br>• EN 45545-3 Fire Safety in Railway Vehicles<br>• EN50121-4 Railway-Signaling and Telecommunications Apparatus<br>• EN50121-3-2 Railway-Apparatus for Rolling Stock<br>• NEMA TS-2 DC Power Traffic Control Equipment (Pending)<br>• ODVA Industrial EtherNet/IP<br>• ABB Industrial IT Certificate<br>• IP67 (per EN60529)<br>• NEMA 4 (per UL 50E) |
| Corrosive Testing[*] | • ISO 9223: Corrosion<br>• class C3-Medium<br>• ISO 9223: Corrosion<br>• class C4-High<br>• EN 60068-2-52 Salt mist testing |
| Humidity | • IEC 60068-52-2 (Salt Fog Mist, Test Kb) Marine Environments<br>• IEC 60068 -2-3<br>• IEC 60068-2-30<br>• Relative Humidity: 5% to 95% Non-condensing |
| Operating Temperature | • -40C to +60C<br>• EN 60068-2-1<br>• EN 60068-2-2<br>• EN 61163<br>• Altitude: Up to 13,800 feet or 4,200 meters |
| Storage Temperature | • -40C to +85C<br>• IEC 60068-2-14<br>• Altitude: Up to 13,800 feet or 4,200 meters |
| MTBF | • Mean Time Between Failures: 374,052 Hours (42.7 Years) |
| Warranty | • Five-Year Limited Warranty |

**Table 7.**     Management and Standards

| Description | Specification | Specification |
|---|---|---|
| **IEEE Standards** | • IEEE 802.1D MAC Bridges, STP<br>• IEEE 802.1p Layer2 COS Prioritization<br>• IEEE 802.1q VLAN<br>• IEEE 802.1s Multiple Spanning-Trees<br>• IEEE 802.1w Rapid Spanning-Tree<br>• IEEE 802.1x Port Access Authentication<br>• IEEE 802.1AB LLDP<br>• IEEE 802.3ad Link Aggregation (LACP)<br>• IEEE 802.3af Power over Ethernet provides up to 15.4W DC power to each end device<br>• IEEE 802.3at Power over Ethernet provides up to 25.5W DC power to each end device | • IEEE 802.3af Power over Ethernet<br>• IEEE 802.3at Power over Ethernet Plus<br>• IEEE 802.3x full duplex on 10Base-T<br>• IEEE 802.3 10BASE-T specification<br>• IEEE 802.3u 100BASE-TX specification<br>• IEEE 802.3ab 1000BASE-T specification<br>• IEEE 1588v2 PTP Precision Time Protocol |
| **RFC Compliance** | • RFC 768: UDP<br>• RFC 783: TFTP<br>• RFC 791: IPv4 protocol<br>• RFC 792: ICMP<br>• RFC 793: TCP<br>• RFC 826: ARP<br>• RFC 854: Telnet<br>• RFC 951: BootP<br>• RFC 959: FTP<br>• RFC 1157: SNMPv1<br>• RFC 1901, 1902-1907 SNMPv2<br>• RFC 2273-2275: SNMPv3<br>• RFC 2571: SNMP Management<br>• RFC 1166: IP Addresses<br>• RFC 1256: ICMP Router Discovery | • RFC 1305: NTP<br>• RFC 1492: TACACS+<br>• RFC 1493: Bridge MIB Objects<br>• RFC 1534 DHCP and BootP interoperation<br>• RFC 1542: Bootstrap Protocol<br>• RFC 1643: Ethernet Interface MIB<br>• RFC 1757: RMON<br>• RFC 2068: HTTP<br>• RFC 2131, 2132: DHCP<br>• RFC 2236: IGMP v2<br>• RFC 3376: IGMP v3<br>• RFC 2474: DiffServ Precedence<br>• RFC 3046: DHCP Relay Agent Information Option<br>• RFC 3580: 802.1x RADIUS<br>• RFC 4250-4252 SSH Protocol |
| **SNMP MIB Objects** | • BRIDGE-MIB<br>• CALISTA-DPA-MIB<br>• CISCO-ACCESS-ENVMON-MIB<br>• CISCO-ADMISSION-POLICY-MIB<br>• CISCO-AUTH-FRAMEWORK-MIB<br>• CISCO-BRIDGE-EXT-MIB<br>• CISCO-BULK-FILE-MIB<br>• CISCO-CABLE-DIAG-MIB<br>• CISCO-CALLHOME-MIB<br>• CISCO-CAR-MIB<br>• CISCO-CDP-MIB<br>• CISCO-CIRCUIT-INTERFACE-MIB<br>• CISCO-CLUSTER-MIB<br>• CISCO-CONFIG-COPY-MIB<br>• CISCO-CONFIG-MAN-MIB<br>• CISCO-DATA-COLLECTION-MIB<br>• CISCO-DHCP-SNOOPING-MIB<br>• CISCO-ENTITY-ALARM-MIB<br>• CISCO-ENTITY-VENDORTYPE-OID-MIB<br>• CISCO-ENVMON-MIB<br>• CISCO-ERR-DISABLE-MIB<br>• CISCO-FLASH-MIB<br>• CISCO-FTP-CLIENT-MIB<br>• CISCO-IF-EXTENSION-MIB<br>• CISCO-IGMP-FILTER-MIB<br>• CISCO-IMAGE-MIB | • CISCO-SNMP-TARGET-EXT-MIB<br>• CISCO-STACK-MIB<br>• CISCO-STACKMAKER-MIB<br>• CISCO-STP-EXTENSIONS-MIB<br>• CISCO-SYSLOG-MIB<br>• CISCO-TCP-MIB<br>• CISCO-UDLDP-MIB<br>• CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB<br>• CISCO-VLAN-MEMBERSHIP-MIB<br>• CISCO-VTP-MIB<br>• ENTITY-MIB<br>• ETHERLIKE-MIB<br>• HC-RMON-MIB<br>• IEEE8021-PAE-MIB<br>• IEEE8023-LAG-MIB<br>• IF-MIB<br>• IP-FORWARD-MIB<br>• IP-MIB<br>• LLDP-EXT-MED-MIB<br>• LLDP-MIB<br>• NETRANGER<br>• NOTIFICATION-LOG-MIB<br>• OLD-CISCO-CHASSIS-MIB<br>• OLD-CISCO-CPU-MIB<br>• OLD-CISCO-FLASH-MIB<br>• OLD-CISCO-INTERFACES-MIB |

| Description | Specification | Specification |
|---|---|---|
| | • CISCO-IP-STAT-MIB<br>• CISCO-LAG-MIB<br>• CISCO-LICENSE-MGMT-MIB<br>• CISCO-MAC-AUTH-BYPASS-MIB<br>• CISCO-MAC-NOTIFICATION-MIB<br>• CISCO-MEMORY-POOL-MIB<br>• CISCO-PAE-MIB<br>• CISCO-PAGP-MIB<br>• CISCO-PING-MIB<br>• CISCO-PORT-QOS-MIB<br>• CISCO-PORT-SECURITY-MIB<br>• CISCO-PORT-STORM-CONTROL-MIB<br>• CISCO-PROCESS-MIB<br>• CISCO-PRODUCTS-MIB<br>• CISCO-RESILIENT-ETHERNET-PROTOCOL-MIB<br>• CISCO-RTTMON-ICMP-MIB<br>• CISCO-RTTMON-IP-EXT-MIB<br>• CISCO-RTTMON-MIB<br>• CISCO-RTTMON-RTP-MIB | • OLD-CISCO-IP-MIB<br>• OLD-CISCO-MEMORY-MIB<br>• OLD-CISCO-SYS-MIB<<br>• OLD-CISCO-SYSTEM-MIB<br>• OLD-CISCO-TCP-MIB<br>• OLD-CISCO-TS-MIB<br>• RMON-MIB<br>• RMON2-MIB<br>• SMON-MIB<br>• SNMP-COMMUNITY-MIB<br>• SNMP-FRAMEWORK-MIB<br>• SNMP-MPD-MIB<br>• SNMP-NOTIFICATION-MIB<br>• SNMP-PROXY-MIB<br>• SNMP-TARGET-MIB<br>• SNMP-USM-MIB<br>• SNMP-VIEW-BASED-ACM-MIB<br>• SNMPv2-MIB<br>• TCP-MIB<br>• UDP-MIB |

## Warranty Information

Warranty information is available at http://www.cisco-servicefinder.com/warrantyfinder.aspx.

## Service and Support

Cisco is committed to minimizing total cost of ownership (TCO) for its customers. The company offers a portfolio of technical support services to help make sure 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 8 are available as part of the Cisco Desktop Switching Service and Support solution and are available directly from Cisco and through resellers.

**Table 8.**    Cisco Services and Support Programs

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

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