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Cisco Industrial Ethernet 2000 IP67 Series Switches

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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.

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 Precision Time 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: • 802.1x • Port security • Dynamic port-based authentication using DHCP • Encrypted administrative traffic • 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	 Cisco DNA Center enables centralized automation and assurance at scale with a Cisco DNA Essentials 3-year or 5-year or 7-year term-based subscription license. 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.

Feature	Description/benefit(s)
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 10/100 Base-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. Table 3 lists license upgrades. Table 4 shows product specifications. Table 5 lists software features. Table 6 details the Cisco DNA Essentials PIDs available for order. Table 7 includes compliance specifications. Table 8 outlines management and relevant industry standards.



Figure 1. Industrial Ethernet 2000 IP67 Series switches

Table 2.	Industrial Ethernet	2000 IP67	Series	configuration
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PID	Total ports		GE X-code ports	Manufacturing license	IEEE1588	NAT	РоЕ (+)
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 Base	х	X*	x
IE-2000-16T67P-G-E	18	16	2 GE	LAN Base	x	X*	x

*Requires LAN Base to LAN Enhanced image (enables Layer 2 NAT)

Table 3.	Power supply, license upgrade, and additional parts
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Product number	Description
PWR-IE160W-67-DC=	IP67-rated PoE DC-DC power supply, Input:18V-60V Output: 54V, 3.1A max 160W
SD-IE-1GB	1GB SD Memory Card
IE-LICENSE-SPARE	Spare license for software upgrade (L2 to L3 features, MRP ring, etc)
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 IEEE 1588v2 FPGA 64MB on-board flash memory 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 IE-2000-8T67P-G-E, IE-2000-16T67P-G-E, with PoE: 44-57VDC, with PoE+ 50-57VDC PWR-IE160W-67-DC=: 18-60VDC, 12A
Power rating	 IE-2000-8T67-B: 0.023KVA IE-2000-16T67-B: 0.027KVA IE-2000-24T67-B: 0.03 KVA 8 port PoE (4 Port PoE) model: 0.12KVA 16 port PoE (8 port PoE) model: 0.2 KVA
Power consumption	 IE-2000-8T67-B: 7-17W IE-2000-16T67-B: 10-20W IE-2000-24T67-B: 12-22W 8-port PoE (4 Port PoE/4 Port PoE+) model: 73-140W 16 port PoE (4 Port PoE+/8-port PoE) model: 137-150W
Connectors and cabling	Data cable• Copper 100 Base-T M12 D coded 4-pole (pin) cable connector• Copper GE M12 X coded-8-pole (pin)-cable connectorAlarm cable• M12 A-Coded 5-Pin CableConsole cable• M12 A Coded 5-Pin connector
	 Power supply cables 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 https://www.molex.com/customer.html?supplierPN=1300060737 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 https://www.molex.com/customer.html?supplierPN=1300100863 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 https://www.molex.com/customer.html?supplierPN=1300062419 Power cord from power source to power supply: 2 hole female power cord to open for input DC connector. https://www.molex.com/customer.html?supplierPN=1300062419

Description	Specification
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) 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) IE-2000-24T67-B 24 ports chassis: 9.5" x 14.76" x 3.2" (241.7 x 374.8 x 81.5 mm) PWR-IE160W-67-DC: 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) IE-2000 IP67 16 ports (both models; PoE and non-PoE) 7.28 lbs. (3.30 kg) IE-2000 IP67 24 ports 8.86 lbs. (4.02 kg) PWR-IE160W-67-DC: 5.2 lbs. (2.36kg) PWR-IE180-67-AC: 5.2 lbs. (2.36kg)

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 8), 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

 Table 6.
 Cisco IE 2000 Cisco DNA Essentials license features

Cisco DNA Essentials	Features
Elementry Management	Discovery, topology, inventory, software image management
Assurance	Health Dashboards - Network, Client, Basic Switch & Wired Client Health Monitoring, Compliance, Custom Reports, Device 360 & Wired Client 360
Automation	Cisco Network Plug-and-Play application

Table 7. Cisco IE 2000 Cisco DNA license

PID	Description
IE2000-DNA-E-L	Cisco DNA Essentials license (up to 12 ports)
IE2000-DNA-E-L-3Y	Cisco DNA Essentials 3 year term license (up to 12 ports) option
IE2000-DNA-E-L-5Y	Cisco DNA Essentials 5 year term license (up to 12 ports) option
IE2000-DNA-E-L-7Y	Cisco DNA Essentials 7 year term license (up to 12 ports) option
IE2000-DNA-E-M	Cisco DNA Essentials license (up to 24 ports)
IE2000-DNA-E-M-3Y	Cisco DNA Essentials 3 year term license (up to 24 ports) option
IE2000-DNA-E-M-5Y	Cisco DNA Essentials 5 year term license (up to 24 ports) option
IE2000-DNA-E-M-7Y	Cisco DNA Essentials 7 year term license (up to 24 ports) option

Note: Cisco DNA Advantage is not available on IE2000 Series Switches

Table 8. Compliance specifications

Description	Specification
Safety certifications	 UL/CSA 60950-1 EN 60950-1 CB to IEC 60950-1 with all country deviations NOM to NOM-019-SCFI (through partners and distributor) CCC (for power supply only) (Pending)
Industrial (control equipment) floor	 UL 508 CSA C22.2, No 142 CSA C22, 2 No 107.1 (for Power Supply Only)

Description	Specification
Operating environment	 Operating Temperature: -40C to +60C EN 60068-2-1 EN 60068-2-2 EN 61163 Altitude: Up to 13,800 feet or 4,200 meters
EMC emissions and immunity compliance	 FCC 47 CFR Part 15 Class A EN 55011 EN 55022A Class A VCCI Class A AS/NZS CISPR 22 Class A CISPR 11 Class A CISPR 22 Class A CISPR 22 Class A ICES 003 Class A CNS13438 Class A KN22 EN55024 CISPR 24 AS/NZS CISPR 24 KN24 Brazil ANATEL certification EN 61000-4-2 Electro Static Discharge EN 61000-4-4 Electromagnetic Fast Transients EN 61000-4-5 Surge EN 61000-4-6 Conducted RF EN 61000-4-8 Power Frequency Magnetic Field EN 61000-4-10 Oscillatory Magnetic Field 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 IEC 60068-2-27 (Shock) IEC 60068-2-31 (Shock) IEC 60068-2-32 (Shock) IEC 60068-2-64 (Vibration) EN 61373 Cat 1 Class B (Shock and Vibration)

Description	Specification
Industry standards	 EN 61000-6-2 Industrial EN 61000-6-4 Industrial EN 61000-6-1 Light Industrial EN 61326 Industrial Control EN 61326 Industrial Control EN 6131-2 Programmable Controllers Marine (DnV) ENV3 (Pending) EN 60945 Maritime navigation and radio equipment and systems (Pending) IEEE 1613 Electric Power Stations Communications Networking (Pending) IEC 61850-3 Electric Substations Communications Networking (Pending) EN 50155 EMC, EMI Environmental and Mechanical, galvanic isolation on uplinks (g1/1 g1/2) only EN 45545-3 Fire Safety in Railway Vehicles EN 45545-2 Fire Protection ENS0121-4 Railway-Signaling and Telecommunications Apparatus ENS0121-3-2 Railway-Apparatus for Rolling Stock NEMA TS-2 DC Power Traffic Control Equipment (Pending) ODVA Industrial EtherNet/IP ABB Industrial IT Certificate IP67 (per EN60529) NEMA 4 (per UL 50E)
Corrosive testing [*]	 ISO 9223: Corrosion class C3-Medium ISO 9223: Corrosion class C4-High EN 60068-2-52 Salt mist testing
Humidity	 IEC 60068-52-2 (Salt Fog Mist, Test Kb) marine environments IEC 60068 -2-3 IEC 60068-2-30 Relative humidity: 5% to 95% noncondensing
Operating temperature	 -40°C to +75°C -40°C to +70°C (vented enclosure operating) -40°C to +60°C (sealed enclosure operating) -34°C to +75°C (200 LFM or more fan- or blower-equipped enclosure operating) -40°C to +85°C (type tested to +85°C for 16 hours) Altitude: Up to 13,800 feet (4570 meters)
Storage temperature	 -40°C to +85°C IEC 60068-2-14 Altitude: Up to 13,800 feet or 4,200 meters
MTBF	• Mean time between failures: 374,052 hours (42.7 years)
Warranty	• 5-year limited warranty

Table 9. Management and standards

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

Description	Specification	Specification
	CISCO-ENTITY-ALARM-MIB	• IP-MIB
	CISCO-ENTITY-VENDORTYPE-OID-MIB	• LLDP-EXT-MED-MIB
	CISCO-ENVMON-MIB	• LLDP-MIB
	• CISCO-ERR-DISABLE-MIB	NETRANGER
	• CISCO-FLASH-MIB	NOTIFICATION-LOG-MIB
	CISCO-FTP-CLIENT-MIB	OLD-CISCO-CHASSIS-MIB
	CISCO-IF-EXTENSION-MIB	OLD-CISCO-CPU-MIB
	CISCO-IGMP-FILTER-MIB	OLD-CISCO-FLASH-MIB
	CISCO-IMAGE-MIB	OLD-CISCO-INTERFACES-MIB
	• CISCO-IP-STAT-MIB	OLD-CISCO-IP-MIB
	• CISCO-LAG-MIB	OLD-CISCO-MEMORY-MIB
	CISCO-LICENSE-MGMT-MIB	OLD-CISCO-SYS-MIB<
	• CISCO-MAC-AUTH-BYPASS-MIB	OLD-CISCO-SYSTEM-MIB
	CISCO-MAC-NOTIFICATION-MIB	OLD-CISCO-TCP-MIB
	CISCO-MEMORY-POOL-MIB	OLD-CISCO-TS-MIB
	• CISCO-PAE-MIB	• RMON-MIB
	CISCO-PAGP-MIB	RMON2-MIB
	CISCO-PING-MIB	• SMON-MIB
	CISCO-PORT-QOS-MIB	SNMP-COMMUNITY-MIB
	CISCO-PORT-SECURITY-MIB	SNMP-FRAMEWORK-MIB
	CISCO-PORT-STORM-CONTROL-MIB	• SNMP-MPD-MIB
	CISCO-PROCESS-MIB	SNMP-NOTIFICATION-MIB
	CISCO-PRODUCTS-MIB	• SNMP-PROXY-MIB
	CISCO-RESILIENT-ETHERNET- PROTOCOL- MIB	• SNMP-TARGET-MIB
	CISCO-RTTMON-ICMP-MIB	• SNMP-USM-MIB
	• CISCO-RTTMON-IP-EXT-MIB	• SNMP-VIEW-BASED-ACM-MIB
	• CISCO-RTTMON-MIB	• SNMPv2-MIB
	• CISCO-RTTMON-RTP-MIB	• TCP-MIB
		• UDP-MIB

Warranty information

Warranty information is available at <u>https://www.cisco-servicefinder.com/warrantyfinder.aspx</u>.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's <u>Corporate Social Responsibility</u> (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Reference links to product-specific environmental sustainability information that is mentioned in relevant sections of this data sheet are provided in the following table:

Sustainability topic	Reference	
Power		
Power specifications and consumption	Table 8. IE2000 power specifications	
Environmental Characteristics		
Operating temperature, industry standards, EMC emissions	Table 8. Compliance specifications	
Material		
Unit Weight	Table 6. IE2000 physical configurations	

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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 9 are available as part of the Cisco Desktop Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 10.	Cisco services and support programs
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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

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