

# Cisco IE3500 Heavy Duty Series

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## Products overview

The Cisco IE3500 Heavy Duty Series (IE3500H) switches deliver high bandwidth, high power and better switching performance in a dustproof and waterproof form factor. The Cisco IE3500 Heavy Duty Series is designed to support features that enable the industrial network infrastructure to seamlessly accommodate machine vision use cases, AI-driven analysis, virtualization, and robust security for Operational Technology (OT) networks.

### Advanced Features for Operational Technology (OT) Networks

- **TSN Frame-Preemption<sup>1</sup>:** With IEEE802.1Qbu and IEEE802.3br based frame-preemption technology, the IE3500H significantly reduces jitter and delay in transmission of time-sensitive control traffic in OT networks.
- **Enhanced Resiliency:** The IE3500H supports protocols such as **Media Redundancy Protocol (MRP)**, **Resilient Ethernet Protocol (REP)**, and **Device Level Ring (DLR)<sup>2</sup>**, providing redundancy and fast failover times.
- **Lossless Redundancy:** For deployments requiring uninterrupted connectivity, the IE3505H includes **High-Availability Seamless Redundancy (HSR)<sup>2</sup>** and **Parallel Redundancy Protocol (PRP)<sup>2</sup>**, ensuring seamless failover and network continuity.

### Network Security and Observability

- **Secure Boot:** The IE3500H features Secure Boot designed to ensure that only trusted and authenticated software is executed during the boot process, with its hardware-anchored root of trust in Cisco Trust Anchor Module.
- **Cyber visibility:** Cisco Cyber Vision built-into the IE3500H identifies connected assets, their profiles, vulnerabilities, and communication patterns to assess your OT security posture and help drive cybersecurity best practices.
- **Secure remote access<sup>1</sup>:** Cisco Secure Equipment Access<sup>1</sup> built-into the IE3500H enables zero-trust remote access to connected assets.
- **Segmentation:** Cisco TrustSec technology enables policy-based segmentation that helps reduce attack surfaces and contains threats by automatically adapting access based on user and device identity.
- **Network Assurance:** IE3500 can host ThousandEyes Enterprise Agent<sup>1</sup> that gains visibility into owned and third-party network to avoid network outages.

### Flexible Management Options

The IE3500H offers multiple management choices to suit various deployment needs:

1. **On-Device Management:** Use the **WebUI or command line tool** for standalone devices, providing an intuitive on-device GUI.
2. **On-Premises Management:** Manage the IE3500H via **Catalyst Center** for on-premise deployments.

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## Fabric Capabilities

The IE3500H supports Layer 3 functionality and can extend the IT fabric into the OT network. With support for Cisco Software Defined Access Fabric Edge<sup>1</sup> and BGP-EVPN<sup>1</sup>, large networks are easy to scale and manage

## Future-Ready Network Capabilities

The IE3500H is designed to meet the demands of expanding networks, offering:

- **Two 10G (SFP+) uplink ports** for high-speed connectivity.
- **Up to 60W of PoE power per port**, ensuring support for power-intensive devices.

The Cisco IE3500 Heavy Duty Series is a secure, scalable, and reliable solution, ideal for industrial environments requiring high performance, advanced security, and seamless connectivity.

<sup>1</sup> Planned to be supported with a future IOS-XE release

<sup>2</sup> Supported on IE3505H variants only



**Figure 1.**  
IE3500H Product Family

## Features and benefits

**Table 1.** IE3500H Features and Benefits

Feature	Benefit
<b>Heavy-duty design and industry compliance</b>	<ul style="list-style-type: none"> <li>• Built for harshest environments and temperature ranges (–40°C to +75°C or –40°F to 167°F)</li> <li>• IP66/IP67 rated, providing protection against dust and submersion in water</li> <li>• Hardened for vibration, shock and surge, electrical noise immunity</li> <li>• Compliant with industrial automation standards; supports Ethernet/IP Common Industrial Protocol (CIP)</li> <li>• Supports Supervisory Control And Data Acquisition (SCADA) protocol, Modbus TCP/IP</li> </ul>
<b>Ethernet Interfaces</b>	<ul style="list-style-type: none"> <li>• Provides secure access for new high-speed applications in the industrial space</li> <li>• Choice of different port counts from 8 to 24 with a mix of X-code, D-code, SFP ports to choose from</li> <li>• Port speed options range from 100M to 10G</li> <li>• Connects high-speed wireless access points (802.11n, 802.11ac, 802.11ax)</li> <li>• Enables High-Definition (HD) IP cameras and Programmable Logic Controllers (PLC)</li> <li>• Supports precision time protocol as a transparent or a boundary clock.</li> <li>• Delivers multiple resilient rings and redundant ring topology for network configurations</li> </ul>
<b>High-density industrial Power over Ethernet (PoE)</b>	<ul style="list-style-type: none"> <li>• Supports up to 14 PoE ports with combination of PoE/PoE+/4PPoE ports and total power budget of up to 240W</li> <li>• Fast and Perpetual PoE ensure seamless PoE experience and quick boot of end points</li> <li>• Controls costs by limiting wiring, distribution panels, and circuit breakers</li> <li>• Reduces equipment needs, thus requiring less space and reducing heat dissipation</li> <li>• Enables ready-to-use PoE devices, such as IP phones, cameras, and wireless access points</li> </ul>
<b>Network security</b>	<ul style="list-style-type: none"> <li>• Device security for secure boot with its hardware-anchored root of trust in Cisco Trust Anchor Module</li> <li>• Support for MACSEC-256 to prevent man-in-the-middle attack</li> <li>• Supports Cisco Cyber Vision to identify all devices and assets on the network</li> <li>• Supports Cisco TrustSec technology based network segmentation to help reduce the spread of malware</li> <li>• Supports Cisco Secure Equipment Access<sup>1</sup> for zero-trust remote access to connected industrial assets, enabling secure troubleshooting, monitoring, and maintenance, without requiring VPNs</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Easy configuration through WebUI on device</li> <li>• On-prem management through Catalyst Center</li> </ul>

Feature	Benefit
<b>IOx Application Hosting</b>	<ul style="list-style-type: none"> <li>• Cisco Cyber Vision for Visibility</li> <li>• Secure Equipment Access for Zero trust network Access<sup>1</sup></li> <li>• ThousandEyes enterprise Agent<sup>1</sup></li> </ul>
<b>Fabric support</b>	<ul style="list-style-type: none"> <li>• Scale OT networks by enabling fabric over Layer 3 underlay</li> <li>• Support for Cisco Software Defined Access</li> <li>• Extended and Policy Extended node</li> <li>• Fabric Edge node<sup>1</sup></li> <li>• Support for BGP-EVPN<sup>1</sup></li> </ul>
<b>Swap Drive: zero-configuration replacement</b>	<ul style="list-style-type: none"> <li>• True zero-configuration and simple switch replacement when swapping RMA units or system upgrade</li> <li>• No networking expertise required</li> <li>• Helps ensure fast recovery</li> </ul>
<b>Full Flexible NetFlow (FNF)</b>	<ul style="list-style-type: none"> <li>• Provides enhanced flow and threat visibility</li> <li>• Enables optimization of the network infrastructure, reduces operation costs, and improves capacity planning and security incident detection</li> </ul>
<b>Advanced data plane features<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• Parallel Redundancy Protocol (PRP)<sup>2</sup></li> <li>• High-availability Seamless Redundancy protocol (HSR)<sup>2</sup></li> <li>• Device Level Ring (DLR)<sup>2</sup></li> </ul>

<sup>1</sup> Planned to be supported with a future IOS-XE release

<sup>2</sup> Supported on IE3505 variants only

**Table 2.** Product Feature Set

Product family	Platforms supported	Cisco IOS Software images (feature sets) supported
<b>IE3500</b>	IE3500H	Network Essentials, Network Advantage <sup>1</sup>

<sup>1</sup> Network Advantage License includes all Network Essentials Features.

**Table 3.** IE3500H Port Configurations

Product number*	Total ports	1000/100/10M M12 X-Code ports	100/10M M12 D-Code ports	10G/1G SFP ports	mGig/4PPoE (Type 3) ports	PoE budget	Lossless Redundancy Protocol Support	Network Essential/Network Advantage
IE-3500H-8T-E	8	8	N.A.	--	--	--	N	Network Essentials
IE-3500H-16T-E	16	16	N.A.	--	--	--	N	
IE-3500H-24T-E	24	24	N.A.	--	--	--	N	
IE-3500H-12FT4T-E	16	4	12	--	--	--	N	
IE-3500H-20FT4T-E	24	4	20	--	--	--	N	
IE-3500H-14P2T-E	16	16	--	--	--	240W	N	
IE-3500H-12P2MU2XE	16	12	--	2	2	240W	N	
IE-3505H-16T-E	16	16	--	--	--	--	Y	
IE-3500H-8T-A	8	8	--	--	--	--	N	Network Advantage
IE-3500H-16T-A	16	16	--	--	--	--	N	
IE-3500H-24T-A	24	24	--	--	--	--	N	
IE-3500H-12FT4T-A	16	4	12	--	--	--	N	
IE-3500H-20FT4T-A	24	4	20	--	--	--	N	
IE-3500H-14P2T-A	16	16	--	--	--	240W	N	
IE-3500H-12P2MU2XA	16	12	--	2	2	240W	N	
IE-3505H-16T-A	16	16	--	--	--	--	Y	

**Table 4.** Hardware Specifications

Hardware specifications	All SKUs
Removable storage	SD card <sup>1</sup>
Alarm <sup>2, 3</sup>	1 alarm output relay, 1 alarm input
Console ports <sup>2</sup>	1
Power input	Mini-change, single power source

<sup>1</sup> The SD card is optional and is not shipped by default with the switch.

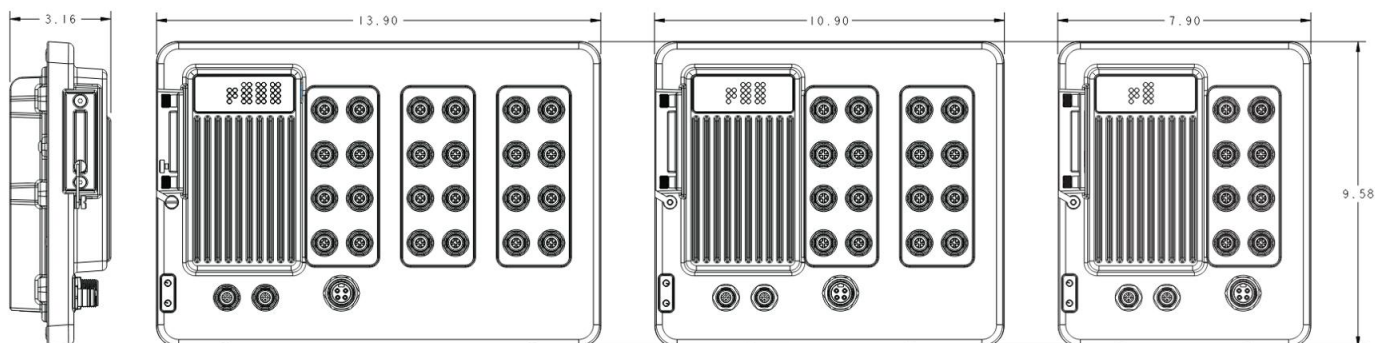
<sup>2</sup> Using an M12 A-coded 5-pin connector.

<sup>3</sup> Relay maximum rating: 30Vdc, 1A or 60Vdc, 0.5A.

**Table 5.**Physical Configurations

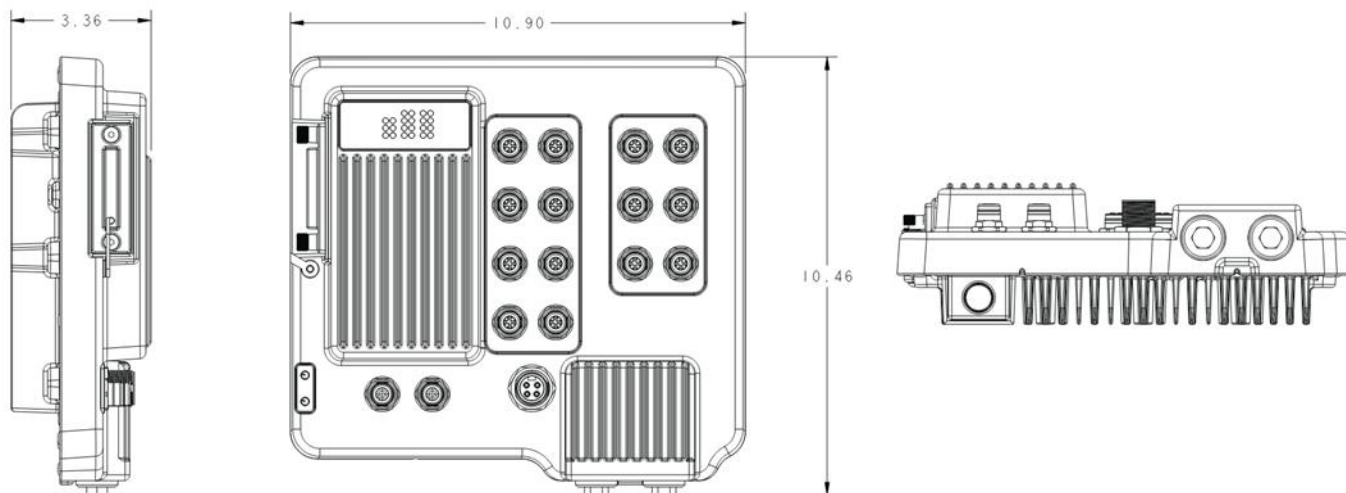
Physical specifications	IE-3500H-8T	IE-3500H-16T	IE-3500H-24T	IE-3500H-12FT4T	IE-3500H-20FT4T	IE-3500H-14P2T	IE-3500H-12P2MU2X	IE-3505H-16T
<b>Dimensions (H x W x D)</b>	9.58 x 7.90 x 3.16 in. 24.33 x 20.07 x 8.03 cm	9.58 x 10.90 x 3.16 in. 24.33 x 27.69 x 8.03 cm	9.58 x 13.90 x 3.16 in. 24.33 x 35.31 x 8.03 cm	9.58 x 10.90 x 3.16 in. 24.33 x 27.69 x 8.03 cm	9.58 x 13.90 x 3.16 in. 24.33 x 35.31 x 8.03 cm	9.58 x 10.90 x 3.16 in. 24.33 x 27.69 x 8.03 cm	10.46 x 10.90 x 3.36 in. 26.57 x 27.69 x 8.53 cm	9.58 x 10.90 x 3.16 in. 24.33 x 27.69 x 8.03 cm
<b>Weight (including mounting bracket)</b>	8.45 lb 3.83 kg	11.25 lb 5.10 kg	13.90 lb 6.30 kg	11.25 lb 5.10 kg	13.90 lb 6.30 kg	11.25 lb 5.10 kg	11.40 lb 5.17 kg	11.25 lb 5.10 kg
<b>Mounting</b>	Wall mount	Wall mount	Wall mount	Wall mount	Wall mount	Wall mount	Wall mount	Wall mount

## IE3500H Product Drawing Images





## Dimensions of the all SKUs except the IE-3500H-12P2MU2X



## Dimensions of IE-3500H-12P2MU2X

**Table 6.** Performance and Scalability Features

Resource	All PIDs
Forwarding rate	Line rate for all ports for all packet sizes
Number of queues	8
Unicast MAC addresses	24000
IGMP multicast groups	1024
No. of Active VLANs	1024
No. of VLAN IDs	4096
IPv4 Indirect routes	7000
IPv6 Indirect routes	1522
Spanning Tree Protocol instances	128
Access Control Entries (PACLs)	1536
DRAM	8 GB
Flash (user accessible)	5.1 GB
SD card capacity <sup>1</sup>	16 GB
Jumbo Frames <sup>2</sup>	9198 bytes

<sup>1</sup> The SD card is optional and is not shipped by default with the switch.

<sup>2</sup> Jumbo Frames are limited to 2000 bytes when using ERSPAN/DLR/PRP/HSR/SGT.

**Table 7.** Power Specifications

Power specifications	IE-3500H-8T	IE-3500H-16T	IE-3500H-24T	IE-3500H-12FT4T	IE-3500H-20FT4T	IE-3500H-14P2T <sup>1</sup>	IE-3500H-12P2MU2X <sup>1</sup>	IE-3505H-16T
<b>Input voltage range (Absolute)</b>	12-48VDC	12-48VDC	12-48VDC	12-48VDC	12-48VDC	12- 54VDC	12- 54VDC	12- 48VDC
<b>Input current @ (9.6V/60V)</b>	3.1A	3.4A	3.5A	3.4A	3.5A	5.8A	6A	3.7A
<b>Power consumption @ (9.6V/60V)<sup>1</sup></b>	38W	41W	42W	41W	42W	45W	45W	45W

<sup>1</sup> Power Consumption excludes PoE Power.

**Table 8.** Key Supported Software Features (Network Essentials)

Network Essentials License (Perpetual)	Features
<b>Layer 2 switching</b>	IEEE 802.1Q, 802.1w, 802.1ab, 802.1s, 802.3ad, NTP, UDLD, CDP, LLDP, unicast MAC filter, PAgP, LACP VTPv2, VTPv3, EtherChannel, Q-in-Q tunneling, voice VLAN, PVST+, MSTP, RSTP, Selective Q-in-Q, Layer 2 Tunneling
<b>Multicast</b>	IGMPv1, v2, v3 snooping, IGMP filtering, IGMP querier, Multicast Listener Discovery (MLD)
<b>Management</b>	WebUI, MIB, SNMP, syslog, DHCP server, SPAN session, RSPAN, FSPAN, FRSPAN, ERSPAN, Express setup, NETCONF, RESTCONF
<b>Security</b>	Port security, 802.1x, Dynamic Host Configuration Protocol (DHCP) snooping, dynamic ARP inspection, IP source guard, guest VLAN, MAC authentication bypass, 802.1x multidomain authentication, storm control - unicast, multicast, broadcast, SCP, SSH, SNMPv3, TACACS+, RADIUS server/client, MAC address notification, BPDU guard, Access Lists(PACL/RACL/VACL), SUDI 2099 (Secure Unique Device identifier), Full Flexible NetFlow (FNF), MACsec-128
<b>Quality of Service (QoS)</b>	Ingress policing, rate limit, egress queuing/shaping, auto QoS
<b>IPv6</b>	IPv6 host support, SNMP over IPv6, HTTP/HTTP(s) over IPv6, SNMP over IPv6, Syslog over IPv6, DHCPv6 relay source, DHCPv6 bulk lease query (RFC 5460), IPv6 stateless Auto Config, SCP/SSH, Radius, TACACS+, NTP over IPv6, IPv6 VRF aware BGPv6, IPV6 ND cache expire, IPv6 support for TFTP, IPv6 DNS transport, IPv6 QoS, IPv6 FHS RA Guard, IPv6 FHS DHCPv6 Guard
<b>Layer 3 routing</b>	Inter-VLAN routing, Static routing, Open Shortest Path First, OSPF v3, Routing Information Protocol (RIP), Policy-Based Routing (PBR)
<b>Industrial Ethernet</b>	CIP Ethernet/IP, IEEE 1588 PTP v2 (default and power), PROFINET
<b>TSN</b>	Frame-Preemption (802.3br, 802.1QBu) <sup>1</sup>
<b>Redundancy</b>	Resilient Ethernet Protocol (REP) ring, PROFINET-Multi Ring Protocol (MRP), REP Fast, REP Segment ID Auto-discovery <sup>1</sup> , REP ZTP Support, Parallel redundancy protocol (PRP) <sup>2</sup> , PTP over PRP <sup>2</sup> , High-Availability Seamless Redundancy (HSR-SAN) <sup>2</sup> , Device Level Ring (DLR) <sup>2</sup> , HSR-PRP Dual Redbox <sup>2</sup>
<b>Utility</b>	Dying gasp, SCADA protocol classification - GOOSE messaging, MODBUS TCP/IP

Network Essentials License (Perpetual)	Features
<b>Automation</b>	YANG, NETCONF, RESTCONF
<b>Industrial Management</b>	Layer 2 switching with 1:1 switch Network Address Translation (L2NAT) for 1G/10G uplink ports
<b>IOx</b>	Container (Native Docker), Cisco Cyber Vision, Secure Equipment Access <sup>1</sup> , Cisco ThousandEyes <sup>1</sup>

<sup>1</sup> Planned to be supported with a future IOS-XE release

<sup>2</sup> Supported on IE3505H variants only

**Table 9.** Key Supported software features (Network Advantage License)

Network Advantage License (Perpetual) <sup>1</sup>	Features
<b>IP routing Protocols</b>	OSPF (IPv4 and IPv6), BGP (v4 and v6), ISIS (v4 and v6), EIGRP (v4 and v6), HSRP (v4 and v6), BFD Echo Mode for OSPFv3
<b>Virtualization</b>	VRF-lite, VRF-Aware SGT
<b>Security</b>	Cisco TrustSec®: Security group ACL (SGACL), SGACL logging, Extensible Authentication Protocol – Transport Layer Security (EAP-TLS), IEEE 802.1AE MACsec-256, SD-Access Policy Extended Node, SD-Access Fabric Edge Node, Generic Routing Encapsulation (GRE)
<b>Fabric</b>	Cisco SDA fabric edge <sup>2</sup> , BGP-EVPN leaf node <sup>2</sup>
<b>IP Multicast</b>	PIM sparse mode (PIM-SM), PIM dense mode (PIM-DM), MSDP, Multicast routing BSR (IPv4/IPv6), Auto RP (IPv4), Embedded RP (IPv6)
<b>Industrial Ethernet</b>	Layer 3 Network Address Translation (L3NAT)

<sup>1</sup> Network Advantage License includes all Network Essentials features.

<sup>2</sup> Planned to be supported with a future IOS-XE release

**Table 10.** Cisco DNA Essentials and Advantage Features

Feature	Description	Cisco Catalyst Center DNA Essentials <sup>2</sup>	Cisco Catalyst Center DNA Advantage <sup>1,2</sup>
<b>Cisco Catalyst Center</b>	Discovery, topology, inventory, software image management	Yes	Yes
<b>Visibility</b>	Overall Health Dashboard	Yes	Yes
<b>Day-zero network bring-up automation</b>	Cisco Network Plug-and-Play application	Yes	Yes
<b>SD-Access Extended Node</b>	SD-Access fabric overlay extension	Yes	Yes
<b>Industrial Support</b>	MRP Monitoring, REP Configuration, REP Topology View	Yes	Yes

Feature	Description	Cisco Catalyst Center DNA Essentials <sup>2</sup>	Cisco Catalyst Center DNA Advantage <sup>1,2</sup>
<b>LAN Automation</b>	Lan automation helps create error-free underlay network for SDA deployments	No	Yes
<b>SD-Access Policy Extended Node</b>	SD-Access fabric overlay extension and segmentation	No	Yes
<b>SD-Access Fabric Edge Node</b>	A fabric device that connects wired endpoints to the SDA fabric.	No	Yes
<b>Device 360</b>	Device 360, Client 360, and Network Health Insights	No	Yes
<b>Patch/SMU Lifecycle Management</b>	Management of Software Maintenance Upgrades (SMU) or Patches via Cisco Catalyst Center	No	Yes
<b>Application Visibility and Control (NBAR2)</b>	Provides application-level classification, monitoring, and traffic control	No	Yes

<sup>1</sup> Cisco Catalyst Center DNA Advantage license can be paired only with the Network Advantage license.

<sup>2</sup> Cisco Catalyst Center licenses for Industrial Ethernet switches are add-on/optional and not mandatory. They do not include Network Tier features.

**Table 11.** Compliance Specifications<sup>1</sup>

Description	Specification
<b>ITE safety standards/ certifications</b>	UL/cUL Listing to UL/CSA 60950-1 UL/cUL Listing to UL/CSA 62368-1 CB to IEC 62368-1 with all country national deviations
<b>ICE and manufacturing safety standards/ certifications</b>	UL/cUL Listing to UL/CSA 61010-2-201
<b>Water and dust protection standards/ratings</b>	IEC 60529: IP66/IP67 UL 50E, Type 4X rating
<b>EMC emissions and immunity compliance</b>	Emissions (Class A): FCC 47 CFR Part 15 subpart B ICES-003 EN 55011 EN 55032/ CISPR 32 AS/NZS CISPR 32 CNS15936 Immunity: EN55035/CISPR35

Description	Specification
	AS/NZS CISPR35 KS C 9832
<b>Shock and vibration</b>	IEC 60068-2-6 Vibration: IEC 60068-2-6, IEC60255-21-1 (Vibration) Class 1 Vibration Test IEC 60068-2-27 (Shock) IEC 60068-2-31 (Shock) IEC 60068-2-32 (Shock) IEC 60255-21-2 (Shock) IEC 60068-2-64 (Vibration) IEC 60255-21-3 (Seismic)
<b>Industry standards</b>	EN 61000-6-1 Immunity standards for light industrial ENV EN 61000-6-2 Immunity standards for industrial ENV EN 61000-6-4- Emission standard industrial ENV EN 61326-1 Industrial control ODVA Industrial Ethernet/IP
<b>Automotive</b>	UN ECE R10 <sup>2</sup> E-Mark certification <sup>2</sup>
<b>Railway</b>	EN50155:2021 (clauses 13.4.1-6, 13.4.9, 13.4.10, 13.4.13) <sup>2</sup> EN50121-3-2:2016+A1:2019 EN50121-4:2016+A1:2019 EN61373:2010/AC:2017 (in progress) EN50124-1:2017 <sup>2</sup> AREMA C&S Manual Section 11, 19 EN50153:2020 Clause 8.3 <sup>2</sup> EN45545-2 <sup>2</sup>
<b>Corrosive testing</b>	IEC 60068-2-52 Salt mist IEC 60068-2-60 Flowing mixed gas corrosion
<b>Humidity</b>	IEC 60068 -2-3 IEC 60068-2-30 Relative humidity: 5% to 95% noncondensing

Description	Specification
<b>Operating temperature, environment, reliability</b>	-40° C to +75° C (-40F to 167F) with 200 LFM airflow -40° C to +70° C (-40F to 158F) with 40 LFM airflow -40° C to + 60° C (-40F to 140F) with 0 LFM airflow -40° C to +85° C (-40F to 185F) (type tested to +85° C for 16 hours) IEC 60068-2-1 IEC 60068-2-2 Altitude: up to 15,000 feet, no derating Altitude: up to 40,000 feet, 25° C Max
<b>Storage temperature</b>	-40° C to +85° C (-40F to 185F) IEC 60068-2-14 Altitude: Up to 40,000 feet (12.19 km)
<b>Environment</b>	RoHS, WEEE, REACH compliant

<sup>1</sup> For more detailed information on safety approved power/thermal ratings refer the Hardware Installation Guide

<sup>2</sup> In Progress

**Table 12.** Mean Time Between Failures (MTBF) information – Telecordia Issue 4

Product detail	MTBF (in hours)
<b>IE-3500H-8T</b>	473,949 Hrs
<b>IE-3500H-16T</b>	406,109 Hrs
<b>IE-3500H-24T</b>	387,020 Hrs
<b>IE-3500H-12FT4T</b>	412,063 Hrs
<b>IE-3500H-20FT4T</b>	367,056 Hrs
<b>IE-3500H-14P2T</b>	371,635 Hrs
<b>IE-3500H-12P2MU2X</b>	352,809 Hrs
<b>IE-3505H-16T</b>	404,209 Hrs

**Table 13.** Industry standards

Descriptions	Specifications	
<b>IEEE standards</b>	IEEE 802.1D MAC Bridges, STP	IEEE 1588v2 PTP Precision Time Protocol
	IEEE 802.1p Layer 2 COS prioritization	IEEE 802.3x full duplex on 10BASE-T
	IEEE 802.1q VLAN	IEEE 802.3 10BASE-T specification
	IEEE 802.1s MSTP	IEEE 802.3u 100BASE-TX specification
	IEEE 802.1w RSTP	IEEE 802.3ab 1000BASE-T specification
	IEEE 802.1X Port Access Authentication	IEEE 802.3z 1000BASE-X specification
	IEEE 802.1AB LLDP	IEEE 802.3af Power over Ethernet
	IEEE 802.3ad Link Aggregation (LACP)	IEEE 802.3at Power over Ethernet IEEE 802.3bt Type 3 Power over Ethernet
<b>RFC compliance</b>	RFC 768: UDP	CISCO-IF-EXTENSION-MIB
	RFC 783: TFTP	CISCO-IMAGE-MIB
	RFC 791: IPv4 protocol	CISCO-MEMORY-POOL-MIB
	RFC 792: ICMP	CISCO-PING-MIB
	RFC 793: TCP	SNMP-TARGET-EXT-MIB
	RFC 826: ARP	IF_MIB
	RFC 854: Telnet	ENTITY-MIB
	RFC 959: FTP	LLDP-EXT-PNO-MIB
	RFC 1157: SNMPv1	NOTIFICATION-LOG-MIB
	RFC 1901, 1902-1907 SNMPv2	OLD-CISCO-CPU-MIB
	RFC 2273-2275: SNMPv3	ETHERLIKE-MIB
	RFC 2571: SNMP Management	OLD-CISCO-SYSTEM-MIB
	RFC 1166: IP Addresses	OLD-CISCO-MEMORY-MIB
	RFC 1256: ICMP Router Discovery	RMON-MIB
	RFC 1305: NTP	SNMP-COMMUNITY-MIB
	RFC 1492: TACACS+	SNMP-FRAMEWORK-MIB
	RFC 1493: Bridge MIB Objects	SNMP-PROXY-MIB
	RFC 1534: DHCP and BOOTP interoperation	SNMP-MPD-MIB
	RFC 1542: Bootstrap Protocol	SNMP-NOTIFICATION-MIB
	RFC 1643: Ethernet Interface MIB	SNMP-TARGET-MIB
	RFC 1757: RMON	SNMP-USM-MIB
	RFC 2068: HTTP	CISCO-DATACOLLECTION-MIB
	RFC 2131, 2132: DHCP	CISCO-CABLE-DIAG-MIB
	RFC 2236: IGMP v2	CISCO -PORT-SECURITY-MIB
	RFC 3376: IGMP v3	BULK_FILE_MIB
	RFC 2474: DiffServ Precedence	CISCO-ENTITY-ALARM-MIB
		SNMP-VIEW-BASED-ACM-MIB

Descriptions	Specifications
	RFC 3046: DHCP Relay Agent Information Option RFC 3580: 802.1x RADIUS RFC 4250-4252 SSH Protocol CISCO-MAC-AUTH-BYPASS-MIB CISCO-AUTH-FRAMEWORK-MIB CISCO-BRIDGE-Ext-MIB SNMPv2-MIB CISCO-ENTITY-VENDORTYPE-OID-MIB CISCO-PRODUCTS-MIB IP-FORWARD-MIB BGP-CISCO-BGP-MIBv2

**Table 14.** MIB Object table

<b>SNMP MIB objects</b>	802.1X MIB CISCO-DHCP-SNOOPING-MIB CISCO-UDLD-MIB CISCO-ENVMON-MIB CISCO-PRIVATE-VLAN-MIB CISCO-PAE-MIB Cisco-Port-QoS-MIB CISCO-ERR-DISABLE-MIB CISCO- PROCESS-MIB LLDP-MIB CiscoMACNotification-MIB CISCO-CONFIG-COPY-MIB LLDP-MED-MIB Bridge-MIB CISCO-CAR-MIB CISCO-LAG-MIB CISCO-SYSLOG-MIB CISCO-FTP-CLIENT-MIB CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB CISCO-VLAN-MEMBERSHIP-MIB Cisco-REP-MIB CISCO-PORT-STORM-CONTROL-MIB CISCO-CDP-MIB CISCO-IP-STAT-MIB CISCO-STP-EXTN-MIB CISCO-VTP-MIB IEEE8023-LAG-MIB
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	SMON-MIB CISCO-ACCESS-ENVMON-MIB CISCO-CALLHOME-MIB CISCO-CONFIG-MAN-MIB CISCO-FLASH-MIB CISCO-ENTITY-SENSOR-MIB IP-MIB CISCO-PAGP-MIB
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**Table 15.** Below GE SFPs supported on IE3500H-12P2MU2X<sup>1</sup>

Product ID	Specifications	SFP type	Temperature range <sup>1</sup>	Maximum distance	Cable type	Dom support
<b>GLC-SX-MM-RGD=</b>	1000BASE-SX	GE	IND	220-550 m	MMF	Yes
<b>GLC-LX-SM-RGD=</b>	1000BASE-LX/LH	GE	IND	550 m/10 km	MMF/SMF	Yes
<b>GLC-ZX-SM-RGD=</b>	1000BASE-ZX	GE	IND	70 km	SMF	Yes
<b>SFP-GE-S=</b>	1000BASE-SX	GE	EXT	220-550 m	MMF	Yes
<b>SFP-GE-L=</b>	1000BASE-LX/LH	GE	EXT	550 m/10 km	MMF/SMF	Yes
<b>SFP-GE-Z=</b>	1000BASE-ZX	GE	EXT	70 km	SMF	Yes
<b>GLC-BX-U=</b>	1000BASE-BX10	GE	COM	10 km	SMF	Yes
<b>GLC-BX-D=</b>	1000BASE-BX10	GE	COM	10 km	SMF	Yes
<b>GLC-SX-MM=</b>	1000BASE-SX	GE	COM	220-550 m	MMF	Yes
<b>GLC-LH-SM=</b>	1000BASE-LX/LH	GE	COM	550 m/10 km	MMF/SMF	Yes
<b>GLC-ZX-SM=</b>	1000BASE-ZX	GE	COM	70 km	SMF	Yes
<b>GLC-EX-SMD=</b>	1000BASE-EX	GE	COM	40 km	SMF	Yes
<b>GLC-TE=²</b>	1000BASE-T	GE	EXT	100 m	Cat5e	No
<b>GLC-BX40-U-I=</b>	1000BASE-BX40	GE	IND	40 km	SMF	Yes
<b>GLC-BX40-D-I=</b>	1000BASE-BX40	GE	IND	40 km	SMF	Yes
<b>GLC-BX40-DA-I=</b>	1000BASE-BX40	GE	IND	40 km	SMF	Yes

Product ID	Specifications	SFP type	Temperature range <sup>1</sup>	Maximum distance	Cable type	Dom support
<b>GLC-BX80-U-I=</b>	1000BASE-BX80	GE	IND	80 km	SMF	Yes
<b>GLC-BX80-D-I=</b>	1000BASE-BX80	GE	IND	80 km	SMF	Yes
<b>GLC-SX-MMD=</b>	1000BASE-SX	GE	EXT	550 m	MMF	Yes
<b>GLC-LH-SMD=</b>	1000BASE-LX/LH	GE	EXT	550m/10km	MMF/SMF	Yes
<b>GLC-ZX-SMD=</b>	1000BASE-ZX	GE	EXT	70 km	SMF	Yes
<b>GLC-T-RGD=<sup>2</sup></b>	1000BASE-T	GE	IND	100 m	Copper	NA
<b>GLC-BX-U-I=</b>	1000BASE-BX	GE	IND	10km	SMF	Yes
<b>GLC-BX-D-I=</b>	1000BASE-BX	GE	IND	10km	SMF	Yes
<b>ONS-SI-GE-SX=</b>	1000BASE-SX	GE	COM	20-550 m	SMF	Yes
<b>ONS-SI-GE-LX=</b>	1000BASE-LX/LH	GE	COM	550 m/10 km	MMF/SMF	Yes
<b>ONS-SI-GE-EX=</b>	1000BASE-EX	GE	COM	40 km	SMF	Yes
<b>ONS-SI-GE-ZX=</b>	1000BASE-ZX	GE	COM	70 km	SMF	Yes
<b>ONS-SE-GE-BXU=</b>	1000BASE-BX	GE	COM	10km	SMF	Yes
<b>ONS-SE-GE-BXD=</b>	1000BASE-BX	GE	COM	10km	SMF	yes
<b>CWDM-SFP-xxxx=<sup>3</sup></b>	1000BASE-CWDM	GE	COM	80km	SMF	Yes
<b>DWDM-SFP-xxxx=<sup>3</sup></b>	1000BASE-DWDM	GE	COM	80km	SMF	Yes

<sup>1</sup> If nonindustrial SFPs (EXT, COM) are used, the switch operating temperature must be derated.

<sup>2</sup> Degrades PTP performance

<sup>3</sup> DWDM-SFP-xxxx or CWDM-SFP-xxxx -- 'xxxx' stands for different wavelengths of SFPs, both in case of CWDM and DWDM GE and 10GE SFPs.

**Table 16.** Below 10GE SFP+ supported on IE3500H-12P2MU2X<sup>1</sup>

Product ID	Specifications	SFP type	Temperature range <sup>1</sup>	Maximum distance	Cable type	Dom support
<b>SFP-10G-ER=</b>	10GBASE-ER	10GE	COM	40Km	SMF	Yes
<b>SFP-10G-ER-I=</b>	10GBASE-ER-I	10GE	IND	40Km	SMF	Yes
<b>SFP-10G-SR-I=</b>	10GBASE-SR-I	10GE	IND	26m 33m 66m 82m 300m 400m	MMF	Yes
<b>SFP-10G-LR-X=</b>	10GBASE-LR-X	10GE	EXT	10Km	SMF	Yes Yes
<b>SFP-10G-LR=</b>	10GBASE-LR	10GE	COM	10KM	SMF	Yes
<b>SFP-10G-LR-S=</b>	10GBASE-LR-S	10GE	COM	10Km	SMF	Yes
<b>SFP-10G-LRM=</b>	10GBASE-LRM	10GE	COM	220m 100m 220m 300m	MMF SMF	Yes
<b>SFP-10G-SR=</b>	10GBASE-SR	10GE	COM	26m 33m 66m 82m 300m 400m	MMF	Yes
<b>SFP-10G-BX40D-I=</b>	10G-SFP Bidirectional for 40km	10GE	IND	40Km	SMF	Yes
<b>SFP-10G-BX40U-I=</b>	10G-SFP Bidirectional for 40km	10GE	IND	40Km	SMF	Yes
<b>SFP-10G-BXU-I=</b>	10G-SFP Bidirectional for 10km	10GE	IND	10Km	SMF	Yes
<b>SFP-10G-BXD-I=</b>	10G-SFP Bidirectional for 10km	10GE	IND	10Km	SMF	Yes

Product ID	Specifications	SFP type	Temperature range <sup>1</sup>	Maximum distance	Cable type	Dom support
<b>SFP-H10G-CU1M=</b>	10GBASE-CU SFP+ Cable 1 Meter, passive	10GE	COM	1m	Twinax cable, passive, 30AWG cable assembly	No
<b>SFP-H10G-CU3M=</b>	10GBASE-CU SFP+ Cable 3 Meter, passive	10GE	COM	3m	Twinax cable, passive, 30AWG cable assembly	No
<b>SFP-H10G-CU5M=</b>	10GBASE-CU SFP+ Cable 5 Meter, passive	10GE	COM	5m	Twinax cable, passive, 30AWG cable assembly	No
<b>SFP-10G-ZR=</b>	10GBASE-ZR	10GE	COM	80Km	SMF	Yes
<b>SFP-10G-ZR-I=</b>	10GBASE-ZR-I	10GE	IND	80Km	SMF	Yes
<b>ONS-SI+-10G-SR=</b>	10GBASE-SR	10GE	COM	26m 33m 66m 82m 300m 400m	MMF	Yes
<b>ONS-SI+-10G-LR=</b>	10GBASE-LR-S	10GE	COM	10Km	SMF	Yes
<b>ONS-SI+-10G-ER=</b>	10GBASE-ER	10GE	COM	40Km	SMF	Yes
<b>ONS-SI+-10G-ZR=</b>	10GBASE-ZR	10GE	COM	80Km	SMF	Yes
<b>SFP-10G-T-X=²</b>	10GBASE-CU	10GE	COM	30m-100m	Cat5e	No
<b>SFP-10G-LR10-I=</b>	10GBASE-LR	10GE	COM	10Km	MMF/SMF	Yes
<b>SFP-10G-SR-S=</b>	10GBASE-SR	10GE	COM	26m 33m 66m 82m 300m 400m	SMF	Yes

Product ID	Specifications	SFP type	Temperature range <sup>1</sup>	Maximum distance	Cable type	Dom support
<b>CWDM-SFP10G-xxxx SFP3</b>	CWDM 10 Gigabit Ethernet	10GE	COM		SMF	Yes
<b>DWDM-SFP10G-xxxx SFP<sup>3</sup></b>	DWDM 10 Gigabit Ethernet	10GE	COM		SMF	Yes

<sup>1</sup> If nonindustrial SFPs (EXT, COM) are used, the switch operating temperature must be derated.

<sup>2</sup> Degrades PTP performance.

<sup>3</sup> DWDM-SFP-xxxx or CWDM-SFP-xxxx -- 'xxxx' stands for different wavelengths of SFPs, both in case of CWDM and DWDM GE and 10GE SFPs.

## Ordering information

**Table 17.** Ordering information

Product ID	Description
<b>IE-3500H-8T-E</b>	IE3500 Heavy Duty with 8 GE X-Code M12 interfaces, IP67, Network Essentials
<b>IE-3500H-16T-E</b>	IE3500 Heavy Duty with 16 GE X-Code M12 interfaces, IP67, Network Essentials
<b>IE-3500H-24T-E</b>	IE3500 Heavy Duty with 24 GE X-Code M12 interfaces, IP67, Network Essentials
<b>IE-3500H-12FT4T-E</b>	IE3500 Heavy Duty with 12 FE D-code and 4 GE X-Code M12 interfaces, IP67, Network Essentials
<b>IE-3500H-20FT4T-E</b>	IE3500 Heavy Duty with 20 FE D-code and 4 GE X-Code M12 interfaces, IP67, Network Essentials
<b>IE-3500H-14P2T-E</b>	IE3500 Heavy Duty with 14 GE X-Code PoE/PoE+ and 2 GE X-Code M12 interfaces, IP67, Network Essentials
<b>IE-3500H-12P2MU2XE</b>	IE3500 Heavy Duty with 2 10G SFP+, 2 mGig UPoE X-Code and 12 GE X-Code interfaces, 240W Power Budget, IP67, Network Essentials
<b>IE-3505H-16T-E</b>	IE3500 Heavy Duty with 16 GE X-Code M12 interfaces, Advance features, IP67, Network Essentials
<b>IE-3500H-8T-A</b>	IE3500 Heavy Duty with 8 GE X-Code M12 interfaces, IP67, Network Advantage
<b>IE-3500H-16T-A</b>	IE3500 Heavy Duty with 16 GE X-Code M12 interfaces, IP67, Network Advantage
<b>IE-3500H-24T-A</b>	IE3500 Heavy Duty with 24 GE X-Code M12 interfaces, IP67, Network Advantage
<b>IE-3500H-12FT4T-A</b>	IE3500 Heavy Duty with 12 FE D-code and 4 GE X-Code M12 interfaces, IP67, Network Advantage
<b>IE-3500H-20FT4T-A</b>	IE3500 Heavy Duty with 20 FE D-code and 4 GE X-Code M12 interfaces, IP67, Network Advantage
<b>IE-3500H-14P2T-A</b>	IE3500 Heavy Duty with 14 GE X-Code PoE/PoE+ and 2 GE X-Code M12 interfaces, IP67, Network Advantage

Product ID	Description
<b>IE-3500H-12P2MU2XA</b>	IE3500 Heavy Duty with 2 10G SFP+, 2 mGig UPoE X-Code and 12 GE X-Code interfaces, 240W Power Budget, IP67, Network Advantage
<b>IE-3505H-16T-E</b>	IE3500 Heavy Duty with 16 GE X-Code M12 interfaces, Advance features, IP67, Network Advantage
<b>SD-IE-16GB</b>	IE 16GB SD Memory card
<b>CAB-CONSOLE-M12=</b>	Console Cable 6ft with M12 and DB9F for Cisco IE3500 Heavy Duty Series Switch
<b>IE3500-NW-A=</b>	Cisco Network Advantage license for IE3500 Series, Perpetual
<b>IE3500-DNA-E</b>	Cisco DNA Essentials license for IE3500/IE3500H Series Switches
<b>IE3500-DNA-E-3Y</b>	IE3500/IE3500H Cisco DNA Essentials, 3 Year Term license
<b>IE3500-DNA-E-5Y</b>	IE3500/IE3500H Cisco DNA Essentials, 5 Year Term license
<b>IE3500-DNA-E-7Y</b>	IE3500/IE3500H Cisco DNA Essentials, 7 Year Term license
<b>IE3500-DNA-A</b>	Cisco DNA Advantage license for IE3500/IE3500H Series Switches
<b>IE3500-DNA-A-3Y</b>	IE3500/IE3500H Cisco DNA Advantage, 3 Year Term license
<b>IE3500-DNA-A-5Y</b>	IE3500/IE3500H Cisco DNA Advantage, 5 Year Term license
<b>IE3500-DNA-A-7Y</b>	IE3500/IE3500H Cisco DNA Advantage, 7 Year Term license

\* MRP Feature Licenses are not required from release IOS XE 17.7.1 onwards. Please refer to the IOS XE 17.7.1 [Release Notes](#).

## Connectors and cabling

**Table 18.** Connectors and Cabling

Type	Options
<b>Data Cables</b>	<ul style="list-style-type: none"> <li>• Copper 100Base-T M12 D coded 4-Pin connector</li> <li>• Copper GE M12 X coded-8-Pin- connector</li> <li>• 2x SFP (fiber) 1G/10G interfaces</li> <li>• Note: M25 adapters shall be used with SFP interfaces to meet IP67 rating.</li> </ul>
<b>Alarm Cable</b>	<ul style="list-style-type: none"> <li>• M12 A-Coded 5-Pin connector</li> </ul>
<b>Console Cable</b>	<ul style="list-style-type: none"> <li>• M12 A Coded 5-Pin connector</li> </ul>
<b>Power Supply Cables</b>	<ul style="list-style-type: none"> <li>• Power cord for IP67 switch power input, Mini-Change A-Size single-ended cord set, 4 poles, female to pigtail, 16 AWG PVC cable. Molex part#130006-0737  <a href="https://www.molex.com/customer.html?supplierPN=1300060737">https://www.molex.com/customer.html?supplierPN=1300060737</a></li> <li>• Power cord, IP67 Power supply output to IP67 switch input: Mini-Change A-size double-Ended Cordset, 4 poles male to female. 16 AWG, TPE cable. Molex Part #130010-0863  <a href="https://www.molex.com/customer.html?supplierPN=1300100863">https://www.molex.com/customer.html?supplierPN=1300100863</a></li> </ul>

Type	Options
	<ul style="list-style-type: none"> <li>Power cable for AC-DC power source, Mini-change A-size single-ended cord set, Power cord, IP67 AC power supply input, 3 pins, female insert on one end to pigtail, 16 AWG PVC cable, Molex part# 130006-0223 <a href="https://www.molex.com/customer.html?supplierPN=1300060223">https://www.molex.com/customer.html?supplierPN=1300060223</a></li> <li>Power cord, IP67 DC power supply input: 2 pole female power cord to open for input DC connector <a href="https://www.molex.com/customer.html?supplierPN=1300060091">https://www.molex.com/customer.html?supplierPN=1300060091</a></li> </ul>

## Warranty information

There is a 5-year limited hardware warranty on all Cisco IE3500 Heavy Duty Series switches. For more details, visit <https://www.cisco.com/c/en/us/products/warranties/warranty-doc-c99-740591.html>.

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