

Cisco Industrial Ethernet 3000 Series



Solution 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).

Primary Benefits

- **Rugged:** Specifically designed for harsh environmental conditions that exceed the specifications of most commercial switching products, including IEEE 1613 and IEC 61850 compliance.
- **Easy to use:** Can be configured and managed at the touch of a button using either an onboard GUI tool or the PC-based Cisco Network Assistant. Customized Industrial Automation Smartport templates facilitate fast bring-up and easy configuration, and the IE SwapDrive enables quick and easy switch replacement.
- **Secure:** Comprehensive security features help ensure that only authorized users and traffic can access and traverse the network.



- IT integration:** Provides industry-leading industrial Ethernet features and protocol support, which deliver the performance required for demanding automation applications. Consistent features and tools with the rest of the Cisco switching portfolio facilitate efficient IT support and integration.

Solution Highlights

Modular Design

The Cisco IE 3000 Series solution supports hundreds of customized configurations using a design that allows for a variety of interfaces. (See Figure 1 and Figure 2.)

Figure 1. Cisco IE 3000 with Modules Detached



Figure 2. Sample Cisco IE 3000 Configurations





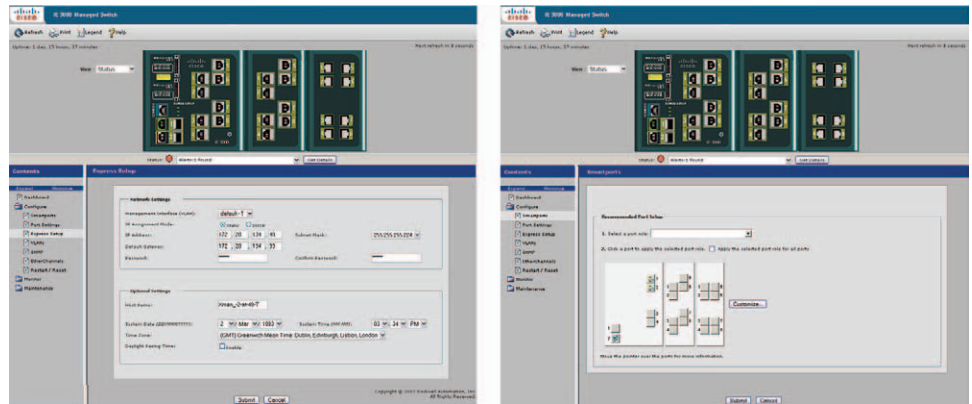
Proven Cisco Switching Architecture

The Cisco IE 3000 Series is based on the Cisco Catalyst® switch architecture and feature set. Utilizing Cisco IOS® Software, the Cisco IE 3000 can be managed with CLI or Cisco Device Manager and can securely integrate with the enterprise network.

Express Setup

The Cisco IE 3000 Series is designed for ease of use. The Express Setup Wizard gets the switch configured and running quickly and easily. The Cisco IE 3000 can be configured using Cisco CLI commands or through the use of the Cisco Device Manager and Smartports. Smartports are customized templates that have been predesigned by Cisco for one-touch configuration. (See Figure 3.)

Figure 3. Cisco Device Manager



Zero-Configuration Replacement Using the IE SwapDrive

This unique ease-of-use feature helps ensure a speedy recovery in the case of hardware failure. The IE SwapDrive is a flash memory component containing all critical switch attributes. Upon a failure, the IE SwapDrive can be quickly swapped out into a new switch with no reconfiguration needed. (See Figure 4.)

Figure 4. IE SwapDrive





Industry-Leading Industrial Features

The Cisco IE 3000 series switches have a wide range of features specifically for industrial automation applications. Resilient Ethernet Protocol (REP) provides rapid Layer 2 network convergence needed for industrial automation applications. Other important industrial features include IEEE1588v2, which is a precision timing protocol for high-performance applications, and Dynamic Host Configuration Protocol (DHCP) persistence for preassignment of IP addresses based on switch port.

The IE 3000 series also supports leading industrial automation protocols, including the Common Industrial Protocol and PROFINET, allowing the switch to communicate with and integrate into industrial management applications. Because the IE 3000 series is based on the industry-leading Cisco Catalyst switching family, the switches also support traditional switching features such as VLANs, IGMP snooping, and querier and advanced security features.

Advanced Layer 3 Routing

Advanced IP routing capabilities provide the ability to integrate multiple cell zones of access layer switches across the plant and facilitate secure integration with networks at the MES and enterprise levels. The Layer 3 version of the IE 3000 supports inter-VLAN routing and advanced routing protocols such as Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Border Gateway Protocol (BGP), Static Routing, and more.

Features such as VRF Lite, Multicast Routing, and support for a large number of IGMP groups make the IE 3000 Layer 3 switch an ideal product to support the requirements of industrial automation networks today and into the future, as additional applications are added to the network.



Solution Specifications

The Cisco IE 3000 base switch is available in both Layer 2 and Layer 3 versions. Both base switches have either a 4-port or 8-port option, each of which can support the following expansion models:

- Up to two 8-port copper modules (IEM-3000-8TM)
- Up to one 8-port fiber module (IEM-3000-8FM)
- No more than two extension modules

Table 1 shows further details about the Cisco IE 3000 modules.

Table 1. Cisco IE 3000 Available Modules




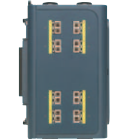

Description	Specification
Cisco IE-3000-4TC Cisco IE 3000-4TC-E 	<ul style="list-style-type: none"> • 4 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 Small Form-Factor Pluggable [SFP]-based Gigabit Ethernet port, 1 port active) • Each switch supports 2 Cisco IE 3000-8TM modules, 1 Cisco IE 3000-8FM module, or 1 Cisco IE 3000-8TM module and 1 Cisco IE 3000-8FM module • Advanced Layer 3 routing (Cisco IE 3000-4TC-E)
Cisco IE-3000-8TC Cisco IE 3000-8TC-E 	<ul style="list-style-type: none"> • 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 IE 3000-8TM modules, 1 Cisco IE 3000-8FM module, or 1 Cisco IE 3000-8TM module and 1 Cisco IE 3000-8FM module • Advanced Layer 3 routing (Cisco IE 3000-8TC-E)
Cisco IE-3000-8TM 	<ul style="list-style-type: none"> • Expansion module for Cisco IE 3000-4TC and Cisco IE 3000-8TC switches, 8 10/100 TX ports
Cisco IE-3000-8FM 	<ul style="list-style-type: none"> • Expansion module for Cisco IE 3000-4TC and Cisco IE 3000-8TC switches, 8 100 FX ports
Cisco IE3000-PWR 	<ul style="list-style-type: none"> • Expansion power module for Cisco IE 3000-4TC and Cisco IE 3000-8TC switches, supports 110/220VAC and 88-300VDC (base switches support 18VDC-60VDC)

Table 2. Cisco IE 3000 Hardware Features and Compliance Specifications

Hardware	<ul style="list-style-type: none"> • DIN-rail, wall, and 19" rack mount options • Intrusion protection rating (IP 20) • Operating temperature: 32 to 113°F (-40 to 70°C) • Operating relative humidity: 10 to 95% (condensing) 	<ul style="list-style-type: none"> • Power inputs: 18-60VDC (Cisco IE3000-4TC and Cisco IE3000-8TC), 85-265VAC/88-300VDC, 1.3-0.8A, 50-60 Hz (with addition of Cisco IE3000-PWR) • IEEE 1588 Precision Time Protocol • Cisco IE Swap Drive (zero-config replacement)
Industry Specifications	<ul style="list-style-type: none"> • IEC 61850-3 (substations) • IEEE1613 (substations) • NEMA TS-2 (ITS) • EN50155 (railway) 	<ul style="list-style-type: none"> • ODVA Common Industrial Protocol • IEEE 1588v2 • PROFINET v2 certification, conformance class B compliance
EMC Interface Immunity	<ul style="list-style-type: none"> • IEC61000-4-2 [Criteria A - Class 2] • IEC61000-4-3/EN50204 [Criteria A] • IEC61000-4-4 [Criteria A / Criteria B] 	<ul style="list-style-type: none"> • IEC61000-4-5 [Criteria B] • IEC61000-4-6 [Criteria A]
Industrial Electromagnetic Emissions	<ul style="list-style-type: none"> • EN 50081-2 • EN 50082-2 • EN 61131-2 	<ul style="list-style-type: none"> • EN 61326-1 • CISPR11 Group 1, Class A • IEC 60533
Hazardous Locations	<ul style="list-style-type: none"> • UL 1602 Class 1, Div 2 A-D • CSA 22.2 / 213 Class 1, Div 2 A-D 	<ul style="list-style-type: none"> • IEC 60079-15 • EN 50021—Class 1, Zone 2