



Product Overview

The Cisco IE 3010 switch provides a rugged and secure switching infrastructure for harsh environments. It is suitable for industrial Ethernet applications, including process manufacturing, intelligent transportation systems (ITSs), rail transportation, and other similar deployments.

In industrial environments, you can connect the switch to any Ethernet-enabled industrial communication devices, including programmable logic controllers (PLCs), human-machine interfaces (HMI), drives, sensors, and input and output (IO) devices.

This section provides overviews of the following topics:

- [Switch Models, page 5](#)
- [Cable Side, page 5](#)
- [Power-Supply Side, page 14](#)
- [Management Options, page 16](#)

Switch Models

Table 1 Switch Models

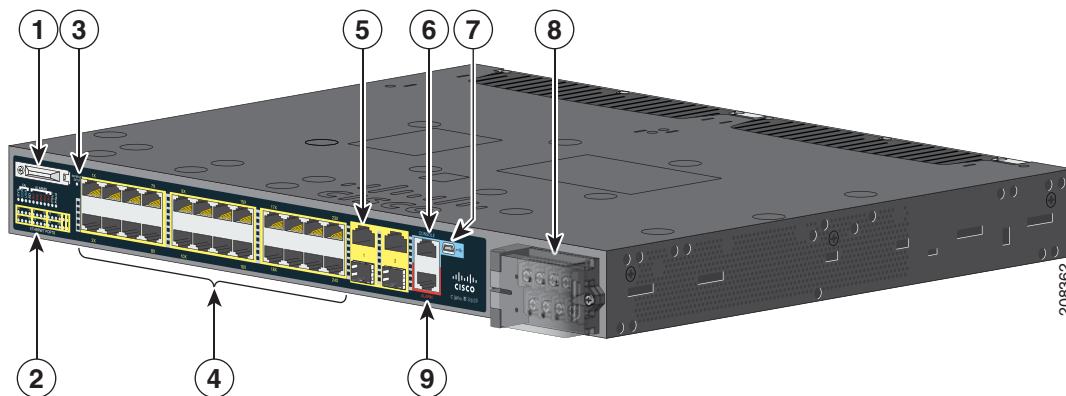
Model	Description
Cisco IE-3010-24TC	24 10/100 FastEthernet ports, 2 dual-purpose ports (2 10/100/1000BASE-T copper ports and 2 SFP ¹ module slots), and 2 AC and DC power-supply module slots.
Cisco IE-3010-16S-8PC	16 100BASE-FX SFP-module slots; 8 10/100 FastEthernet PoE ² ports, 2 dual-purpose ports (2 10/100/1000BASE-T copper ports and 2 SFP module slots), and 2 AC and DC power-supply module slots.

1. SFP = small form-factor pluggable.

2. PoE = Power over Ethernet.

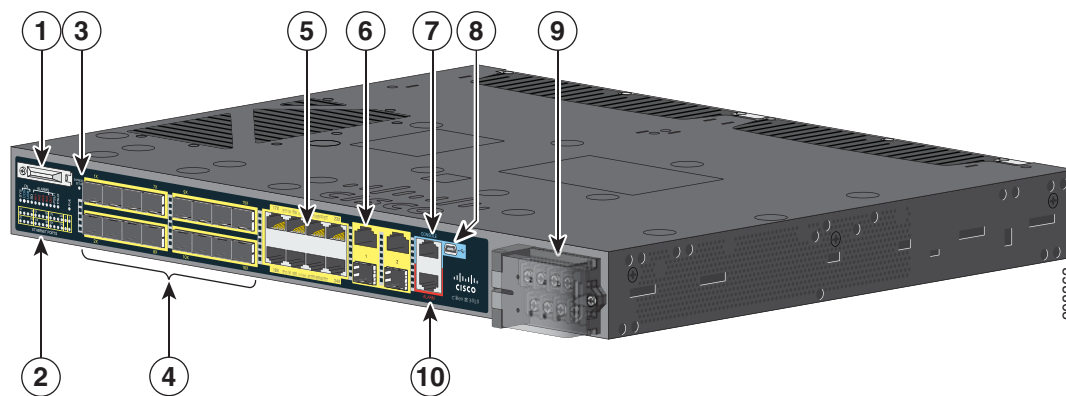
Cable Side

The 10/100 Fast Ethernet downlink ports in [Figure 1 on page 6](#) are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2) on the left. Port 3 is above port 4, and so on. The dual-purpose ports are numbered 1 and 2.

Figure 1 Cisco IE-3010-24TC Cable-Side View

- | | |
|------------------------------------------|----------------------------------|
| 1 SD ¹ flash memory card slot | 6 RJ-45 console port |
| 2 LEDs | 7 USB (mini-Type B) console port |
| 3 Express Setup button | 8 Power-input terminal |
| 4 10/100 ports | 9 Alarm port |
| 5 Dual purpose ports | |
| 1. SD = Secure Digital | |

The 100BASE-FX SFP ports and the 10/100 PoE ports are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2) on the left. Port 3 is above port 4, and so on. The dual-purpose ports are numbered 1 and 2.

Figure 2 Cisco IE-3010-16S-8PC Cable-Side View

- | | |
|-----------------------------|----------------------------------|
| 1 SD flash memory card slot | 6 Dual purpose ports |
| 2 LEDs | 7 RJ-45 console port |
| 3 Express Setup button | 8 USB (mini-Type B) console port |
| 4 100BASE-FX SFP ports | 9 Power-input terminal |
| 5 10/100 PoE ports | 10 Alarm port |

10/100 Fast Ethernet Ports

You can set the 10/100 ports on the switch to operate in any combination of half duplex, full duplex, or 10 or 100 Mb/s. You can set the ports for speed and duplex autonegotiation. The default setting is autonegotiate.

When set for autonegotiation, the switch determines the speed and duplex settings of the attached device and advertises its own capabilities. If the connected device also supports autonegotiation, the switch negotiates the best connection (the fastest line speed that both devices support and full-duplex transmission if the attached device supports it) and configures itself accordingly. In all cases, the attached device must be within 328 feet (100 meters).

10/100/1000BASE-T Copper SFP Module Uplink Slots

The IEEE 802.3 1000BASE-T SFP module slots provide full-duplex 1000BASE-T connectivity over copper wire. These ports use a copper SFP transceiver module that accepts an RJ-45 connector. See [SFP Module Cables, page 74](#) for cable type and length. See [SFP Modules, page 8](#) for model information.

PoE Ports

Warning: Voltages that present a shock hazard may exist on Power over Ethernet (PoE) circuits if interconnections are made using uninsulated exposed metal contacts, conductors, or terminals. Avoid using such interconnection methods, unless the exposed metal parts are located within a restricted access location and users and service people who are authorized within the restricted access location are made aware of the hazard. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security. Statement 1072

The 10/100 PoE ports on the Cisco IE-3010-16S-8PC switches provide PoE support for devices that are compliant with IEEE 802.3af. The Cisco prestandard PoE is also supported for Cisco IP Phones and Cisco Aironet Access Points. The PoE ports on the switch deliver up to 15.4 W of PoE. Any four of the eight ports are designated as high priority PoE ports, while the other four ports are designated as low priority PoE ports. When both the power-supply modules are installed, the system has enough power to support all eight ports as PoE ports. In case one of the power-supply modules fails, the power to the low priority PoE ports is dropped, while power to the high priority PoE ports remains uninterrupted.

On a per-port basis, you control whether or not a port automatically provides power when an IP phone or an access point is connected.

The 10/100 PoE ports use RJ-45 connectors with Ethernet pinouts. The maximum cable length is 328 feet (100 meters). The 100BASE-TX and 1000BASE-T traffic requires CA5, CAT5e, or CAT6 unshielded twisted pair (UTP) cable. The 10BASE-T traffic can use CAT3 or CAT4 UTP cable.

For information about configuring and monitoring PoE ports, see the switch software configuration guide on Cisco.com.

For information about port connections and port specifications, see [Connecting Devices to the Ethernet Ports, page 44](#) and [Connector and Cable Specifications, page 71](#).

Note: The output of the PoE circuit has been evaluated as a Limited Power Source (LPS) per IEC 60950-1.

Dual-Purpose Ports

You can configure the dual-purpose ports on the switch as either 10/100/1000 ports or as SFP-module ports. You can set the 10/100/1000 ports to autonegotiate, or you can configure them as fixed 10, 100, or 1000 Mb/s (Gigabit) Ethernet ports.

By default, the switch selects the medium for each dual-purpose port (10/100/1000BASE-T or SFP). When a link is achieved on one media type, the switch disables the other media type until the active link goes down. If links are active on both media, the SFP-module port has priority, but you can use the **media-type** interface configuration command to manually designate the port as an RJ-45 port or an SFP port.

You can configure the speed and duplex settings consistent with the selected media type. For information on configuring interfaces, see the switch software configuration guide.

SFP Modules

The switch Ethernet SFP modules provide connections to other devices. These field-replaceable transceiver modules provide the uplink interfaces. SFP modules have local connectors (LCs) for fiber-optic connections or RJ-45 connectors for copper connections. You can use any combination of the supported SFP modules listed in [Table 2 on page 8](#).

Table 2 SFP Modules Maximum Operating Temperature

Type of SFP Module	Model
Rugged and Industrial SFPs -40 to 185° F (-40 to 85° C)	<ul style="list-style-type: none"> ■ GLC-SX-MM-RGD ■ GLC-LX-SM-RGD ■ GLC-FE-100LX-RGD ■ GLC-FE-100FX-RGD ■ GLC-FE-T-I ■ GLC-ZX-SM-RGD ■ GLC-BX40-D-I with digital optical monitoring (DOM) support ■ GLC-BX40-DA-I with DOM support ■ GLC-BX80-D-I with DOM support ■ GLC-BX40-U-I with DOM support ■ GLC-BX80-U-I with DOM support
Commercial SFPs 32 to 158° F (0 to 70° C)	<ul style="list-style-type: none"> ■ GLC-BX-D with DOM support ■ GLC-BX-U with DOM support ■ GLC-FE-100LX ■ GLC-FE-100BX-D ■ GLC-FE-100BX-U ■ GLC-FE-100FX ■ GLC-FE-100EX ■ GLC-FE-100ZX ■ GLC-T ■ CWDM SFP with DOM support

Table 2 SFP Modules Maximum Operating Temperature (continued)

Type of SFP Module	Model
Extended temperature SFPs 23 to 185°F (–5°C to 85°C)	■ SFP-GE-L with DOM support
	■ SFP-GE-S with DOM support
	■ SFP-GE-T
	■ SFP-GE-Z with DOM support
	■ GLC-LH-SMD with DOM support
	■ GLC-EX-SMD with DOM support
	■ GLC-TE
	■ GLC-ZX-SMD with DOM support

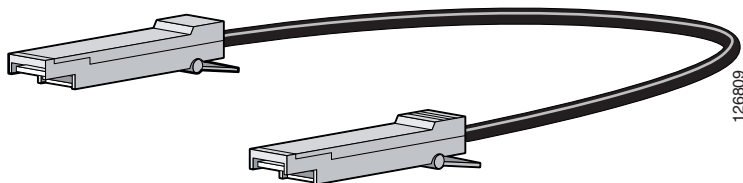
For minimum software requirements, refer to the Release Notes for your platform.

For the most up-to-date list of supported SFP models for Cisco Industrial Ethernet switches, see http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6981.html#wp138176

For information about SFP modules, see your SFP module documentation and the [Installing and Removing SFP Modules, page 35](#). For cable specifications, see the [SFP Module Cables, page 74](#).

SFP Module Patch Cable

The switch uses an SFP-module patch cable, a 0.5-meter, copper, passive cable with SFP module connectors at each end (see [Figure 3 on page 9](#)). The patch cable connects two switches in a cascaded configuration.

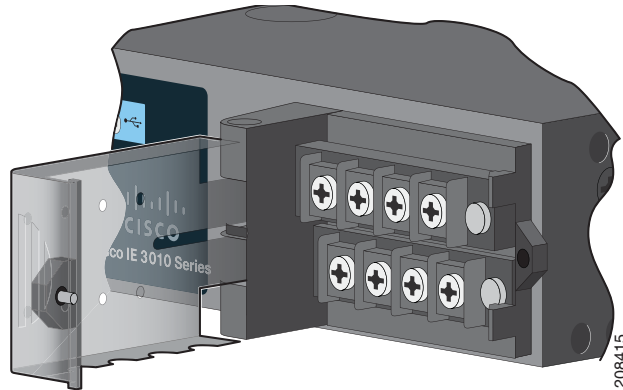
Figure 3 SFP-Module Patch Cable

See the [Inserting and Removing the SFP Module Patch Cable, page 40](#) for information about using the SFP module patch cable.

You can order this cable (part number CAB-SFP-50CM=).

Power-Input Terminal

The power-input terminal provides screw terminals for the AC and DC power connections. The switch can operate with one or two power supplies. If one of the power sources fail, the other continues to power the switch. See [Power Supply Installation, page 47](#) for information.

Figure 4 Power-Input Terminal

Alarm Ports

The switch has four alarm inputs and one alarm output. The alarm setting is open or closed.

- Open means that the normal condition has current flowing through the contact (referred to as a *normally closed* contact). The alarm is generated when the current stops.
- Closed means that no current flows through the contact (referred to as a *normally open* contact). The alarm is generated when the current flows.

Alarm Input

The alarm input is a dry-contact alarm port. You can connect up to four alarm inputs from devices, such as a door, a temperature gauge, or a fire alarm, to the alarm port. You can use the CLI to set the alarm severity to minor, major, or critical. An alarm generates a system message and turns on an LED. See the [Alarm LEDs, page 12](#) for the LED descriptions.

Alarm Output

The alarm output can be configured as a minor or major alarm. Output alarms often control an external alarm, such as a bell or a light. To connect an external alarm device to the relay, you connect two relay contact wires to complete the electrical circuit. See for information on the alarm pinouts. see the [Alarm Port, page 73](#).

Management Ports

You can connect the switch to a PC running Microsoft Windows or to a terminal server through either the RJ-45 console port or the USB console port.

- RJ-45 console port. The RJ-45 connection uses an RJ-45-to-DB-9 female cable.
- USB mini-Type B console port (5-pin connector). The USB connection uses a USB Type A-to-5-pin mini-Type B cable.

The USB console interface speeds are the same as the RJ-45 console interface speeds.

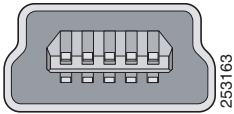
To use the USB console port, you must install the Cisco Windows USB device driver on the device that is connected to the USB console port (device running with Microsoft Windows).

Note: For information about downloading the Cisco USB device driver, see the [Installing the Cisco Microsoft Windows USB Device Drivers, page 84](#).

With the Cisco Windows USB device driver, connecting and disconnecting the USB cable from the console port does not affect Windows HyperTerminal operations. Mac OS X or Linux require no special drivers.

Note: The 5-pin mini-Type B connectors resemble the 4-pin mini-Type B connectors. They are not compatible. Use only the 5-pin mini-Type B. See [Figure 5 on page 11](#).

Figure 5 USB Mini-Type B Port



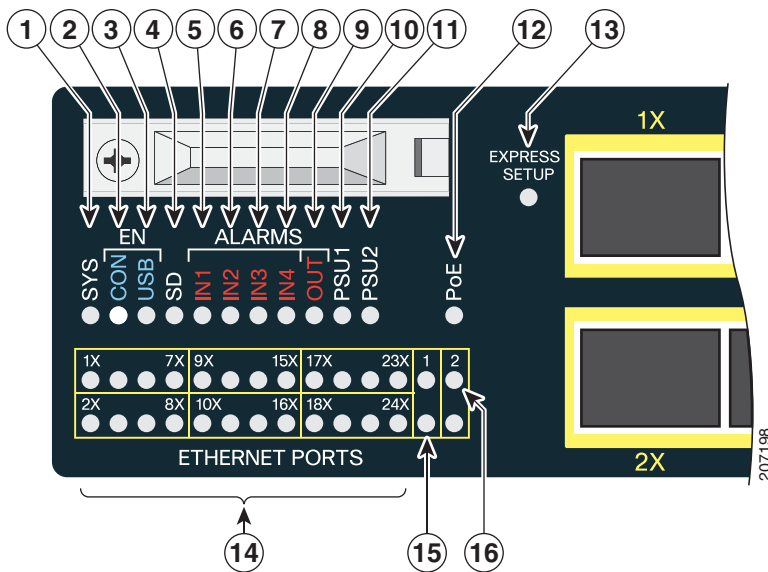
The configurable inactivity timeout reactivates the RJ-45 console port if the USB console port is activated, but no input activity occurs on it for a specified time period. When the USB console port deactivates due to a timeout, you can restore its operation by disconnecting and reconnecting the USB cable. For information on using the CLI to configure the USB console interface, see the switch software guide.

LEDs

You can use the switch system and port LEDs to monitor switch activity and performance.

Switch Panel LEDs

Figure 6 Switch LEDs (Cable Side)



- | | |
|-----------------------------|--------------------------|
| 1 SYS (system) | 9 OUT (alarm output) |
| 2 CON (RJ-45 console) | 10 PSU1 (power supply 1) |
| 3 USB (mini-USB console) | 11 PSU2 (power supply 2) |
| 4 SD (SD flash memory card) | 12 PoE ¹ |
| 5 IN1 (alarm input 1) | 13 Express Setup button |
| 6 IN2 (alarm input 2) | 14 Ethernet ports |

- 7 IN3 (alarm input 3) 15 SFP module port
- 8 IN4 (alarm input 4) 16 10/100/1000 port
- 1. Only on the Cisco IE-3010-16S-8PC switch.

System LED

Table 3 System LED

Color	System Status
Off	System is not powered on.
Blinking green	POST ¹ is in progress.
Green	System is operating normally.
Amber	System is receiving power but is not functioning properly.

1. POST = power-on self-test.

Power-Supply Module LEDs

The switch power-supply module LEDs are labeled PSU1 and PSU2 (on the switch) and PSU OK (on the power-supply module). They show whether power-supply modules 1 and 2 are receiving power. See [Figure 6 on page 11](#) and [Figure 9 on page 15](#).

Table 4 Power-Supply Module LEDs

Color	System Status
Off	Power-supply module (1 or 2) is not installed.
Green	Valid input is present, and the output is within the operating range.
Red	Valid input is present, and the output is outside the operating range or is not present.
Blinking red	Valid input is not present.

Alarm LEDs

Table 5 Alarm Input LEDs

Color	System Status
Off	No alarm
Amber	Minor alarm
Red	Major alarm
Blinking red	Critical alarm

Table 6 Alarm Output LED

Color	System Status
Green	No alarm
Red	Relay closed, alarm present

Console LEDs

The console LEDs show which console port is in use. See [Figure 6 on page 11](#) and [Figure 9 on page 15](#) for the LED locations.

If you connect a cable to a console port, the switch automatically uses that port for console communication. If you connect two console cables, the USB console port has priority.

Table 7 RJ-45 and USB Console Port LEDs

LED	Color	Description
RJ-45 console port	Green	RJ-45 console port is active. USB console port LED is off.
	Off	Port is not active. USB console port is active.
USB console port	Green	USB console port is active. RJ-45 console port LED is off.
	Off	Port is not active. RJ-45 console port is active.

Port LEDs

RJ-45 ports and SFP-module slots have port LEDs. Port LEDs, as a group or individually, provide information about the switch and about the individual ports.

Table 8 Meaning of Port LED Colors

LED Color	Meaning
Off	No link or port was administratively shut down.
Green	Link present but not sending or receiving data.
Blinking green	Activity. Port is sending or receiving data.
Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC errors, and alignment and jabber errors are monitored for link faults.
Amber	Port is blocked by Spanning Tree Protocol (STP) and is not forwarding data. After a port is reconfigured, the port LED is amber for up to 30 seconds as STP searches for loops.

PoE LED

Table 9 PoE LED

Color	Meaning
Off	PoE is not enabled.
Green	PoE is enabled. Ports are functioning correctly.
Amber	PoE is enabled, but an error is present.

Dual-Purpose Port LEDs

The dual-purpose port LEDs identify the connection as either a copper-based connector or an SFP module. The ports can autonegotiate, or you can manually configure each dual-purpose port as either 10/100/1000 with copper connectors or as an SFP-module port, but not as both types at the same time. See [Table 8 on page 13](#) for LED descriptions.

SD Flash Memory Card LED

Table 10 SD Flash Memory Card LED

Color	System Status
Off / blinking green	SD flash memory card transfer in progress.
Blinking amber	SD flash memory card is not present (slow blinking). Unsupported SD flash memory card is detected (fast blinking).
Amber	Error accessing the SD flash memory card. Cisco IOS boot image cannot be found.
Green	SD flash memory card is functioning.

SD Flash Memory Card

The switch ships with the Secure Digital (SD) flash memory card installed. See [Figure 1 on page 6](#) and [Figure 2 on page 6](#). The switch stores the Cisco IOS software images and the switch configuration on the card. You should not remove the card unless you want to use it in a replacement switch. You then do not have to reconfigure the new switch. See the [Replacing the SD Flash Memory Card, page 41](#) for information.

Power-Supply Side

The power-supply side has the LED panel and two power-supply slots for the removable power supplies. See [Figure 7 on page 14](#) and [Figure 8 on page 15](#).

Figure 7 Switch with One Power-Supply Module

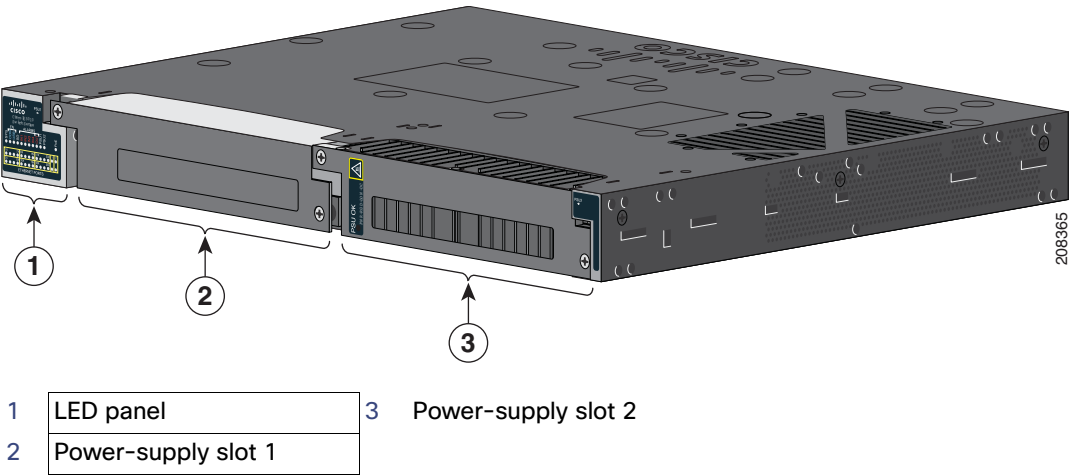
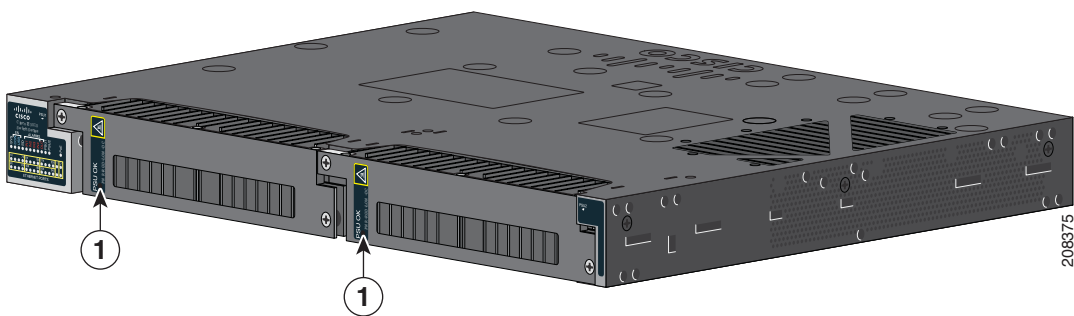


Figure 8 Switch with Both Power-Supply Modules

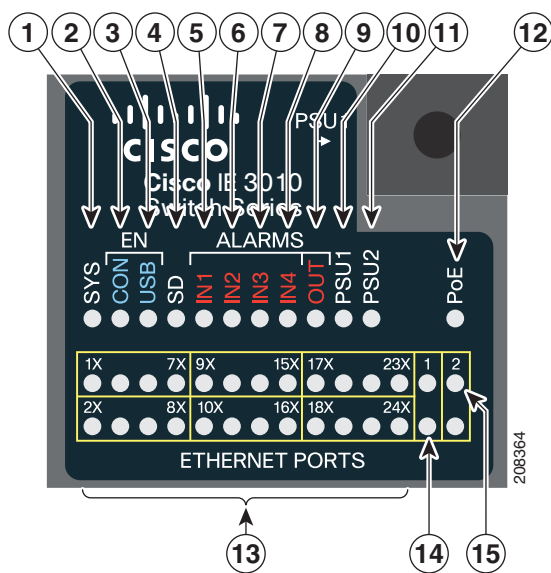


1 PSU OK LED

For a description of the PSU OK LED, see [Table 4 on page 12](#).

Power-Supply Side LEDs

Figure 9 Switch LEDs



- | | |
|-----------------------------|--------------------------|
| 1 SYS (system) | 9 OUT (alarm output) |
| 2 CON (console) | 10 PSU1 (power supply 1) |
| 3 USB LED | 11 PSU2 (power supply 2) |
| 4 SD (SD flash memory card) | 12 PoE ¹ |
| 5 IN1 (alarm input 1) | 13 Ethernet ports |
| 6 IN2 (alarm input 2) | 14 10/100/1000 port |
| 7 IN3 (alarm input 3) | 15 SFP port |
| 8 IN4 (alarm input 4) | |

1. Only on the Cisco IE-3010-16S-8PC switch.

For a description of the LEDs, see the [LEDs, page 11](#).

Power Supply Features

The switch has two slots for power-supply modules:

- PWR-RGD-LOW-DC/IA: low-voltage DC (for voltage information, see [Table 18 on page 69](#))
- PWR-RGD-AC-DC/IA: high-voltage AC or DC (for voltage information, see [Table 17 on page 69](#))

The switch supports these power-supply module combinations:

- Single low-voltage DC
- Single high-voltage AC or DC
- Two high-voltage AC or DC
- Two low-voltage DC
- One high-voltage AC or DC and one low-voltage DC

For information on installing the power-supply modules, see [Power Supply Installation, page 47](#)

See [Table 4 on page 12](#) for information on the power supply LEDs.

Management Options

- Cisco IOS CLI

You can configure and monitor the switch from the CLI. Connect your management station to the switch console port or use Telnet from a remote management station. See the switch command reference on Cisco.com for information.

- SNMP network management

You can manage switches from a Simple Network Management Protocol (SNMP)-compatible management station that is running platforms such as HP OpenView or SunNet Manager. The switch supports a comprehensive set of Management Information Base (MIB) extensions and four Remote Monitoring (RMON) groups. See the switch software configuration guide on Cisco.com and the documentation that came with your SNMP application for information.

Network Configurations

See the switch software configuration guide on Cisco.com for an explanation of network configuration concepts. The software configuration guide also provides network configuration examples for creating dedicated network segments that are interconnected through Ethernet connections.