



Cisco IE 4010 Switch Hardware Installation Guide

First Published: 2016-09-01

Last Modified: 2023-07-28

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883



CONTENTS

CHAPTER 1

Product Overview 1

- Switch Models 1
- Cable Side 2
 - 10/100/1000 PoE/PoE+ Ports (Downlinks) 3
 - Alarms 4
 - Mini USB Port 4
 - SD Flash Memory Card 4
 - Display Mode Button 5
 - Power-Input Terminal 5
 - 100/1000 SFP Ports 5
 - Console Ports 5
 - Switch Panel LEDs 6
 - Port LEDs 7
 - Display Mode Button 9
 - Power-Supply Module LEDs 10
 - Alarm LEDs 10
 - SD Flash Memory Card LED 10
 - USB LED 11
 - System LED 11
- Power-Supply Side 11
 - Power-Supply Side LEDs 12
 - Power Supply Features 13
- Management Options 13
 - Network Configurations 14

CHAPTER 2

Switch Installation 15

Warnings	15
Installation Guidelines	17
Verifying Switch Operation	17
Installing the Switch	17
Rack-Mounting	18
Attaching Brackets for 19-Inch Racks	18
Attaching Brackets for 19-Inch Racks for IP-30 Compliance (Optional)	19
Attaching Brackets for 23-Inch Racks	21
Attaching Brackets for ETSI Racks	23
Rack-Mounting the Switch	24
Wall-Mounting	24
Attaching Brackets	26
Attaching Brackets for IP-30 Compliance (Optional)	27
Wall-Mounting the Switch	27
After the Switch is Mounted on the Wall	28
Installing and Removing SFP Modules	28
Installing SFP Modules	28
Connecting to SFP Modules	31
Removing SFP Modules	33
Replacing the SD Flash Memory Card	33
Connecting Devices to the Ethernet Ports	34
Where to Go Next	35

CHAPTER 3**Power Supply Installation 37**

Power-Supply Modules	37
Power-Supply Module Installation	39
Installation Guidelines	39
Installing a Power-Supply Module	39
Equipment That You Need	40
Grounding the Switch	40
Installing the Power-Supply Module in the Switch	42
Installing the DC Power Supply in the Switch	43
Wiring the Power Source	44
Removing the Power-Supply Module	48

CHAPTER 4**Troubleshooting 49**

- Diagnosing Problems 49
 - Switch Boot Fast 49
 - Switch LEDs 49
 - Switch Connections 49
 - Bad or Damaged Cable 50
 - Ethernet and Fiber-Optic Cables 50
 - Link Status 50
 - 10/100/1000 Port Connections 50
 - SFP Module 51
 - Interface Settings 51
 - Ping End Device 51
 - Spanning Tree Loops 51
 - Switch Performance 51
 - Speed, Duplex, and Autonegotiation 51
 - Autonegotiation and Network Interface Cards 52
 - Cabling Distance 52
- Resetting the Switch 52
- How to Recover Passwords 53
- Finding the Switch Serial Number 53

CHAPTER 5**Hazardous Location Installation Information 55**

- Hazardous Area Installation Warnings 55
- North American Hazardous Location Approval 57
- EMC Environmental Conditions for Products Installed in the European Union 58
- Hazardous Locations Standards 58

CHAPTER 6**Cable and Connectors 61**

- Connector Specifications 61
 - 10/100/1000 Ports 61
 - SFP Module Connectors 61
 - Console Port 62
 - Alarm Port 63

Cables and Adapters	63
SFP Module Cables	63
Console Port Adapter Pinouts	63

CHAPTER 7**Configuring the Switch with the CLI Setup Program 65**

Accessing the CLI Through Express Setup	65
Required Equipment	65
Express Setup Procedure	66
Accessing the CLI Through the Console Port	70
RJ-45 Console Port	70
USB Console Port	71
Installing the Cisco Microsoft Windows XP, 2000, Vista, 7, 8, and 10 USB Device Driver	72
Uninstalling the Cisco Microsoft Windows XP, 2000, Vista, 7, 8, and 10 USB Driver	73
Entering the Initial Configuration Information	73
IP Settings	74
Completing the Setup Program	74

CHAPTER 8**Technical Specifications 77**

Switch Specifications	77
Power-Supply Module Specifications	79
Alarm Ratings	79



CHAPTER 1

Product Overview

The Cisco IE 4010 switch provides a rugged and secure switching infrastructure for harsh environments. It is suitable for industrial Ethernet applications, including process manufacturing, utility substations, 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 (HMIs), drives, sensors, and input and output (IO) devices.

In utility substations the switch can connect to devices such as Intelligent Electronic Devices (IEDs), distributed controllers, substation routers, Cisco IP Phones, Cisco Wireless Access Points, and other network devices such as redundant substation switches.

For detailed specifications, see the [IE 4010 Data Sheet](#).

This chapter contains the following sections:

- [Switch Models](#), on page 1
- [Cable Side](#), on page 2
- [Power-Supply Side](#), on page 11
- [Management Options](#), on page 13

Switch Models

Table 1: Switch Models

Model	Total Ports	Uplinks	SFP Fiber Ports	Copper 10/100/1000 PoE+ Ports ¹	Default Software License	Power Supplies
IE-4010-16S12P	28	4 SFP (100MB/1G)	12 (100/1000M)	12 (10/100/1000M)	LAN Base ²	Support for 2 field-replaceable, redundant AC or DC power supplies.

Model	Total Ports	Uplinks	SFP Fiber Ports	Copper 10/100/1000 PoE/PoE+ Ports ¹	Default Software License	Power Supplies
IE-4010-4S24P	28	4 SFP (100MB/1G)	—	24 (10/100/1000M)	LAN Base	Support for 2 field-replaceable, redundant AC or DC power supplies.



Note ¹All copper Gigabit Ethernet interfaces support speed negotiation to 10/100/1000 mbps and duplex negotiation. Ethernet 4010 Series.



Note ²Can be upgraded to IP Services at a fee. IP Services License Product Numbers are the following: L-IE4000-RTU= (Electronic SW License for IE4000 Switches)

Cable Side

Figure 1: Cisco IE-4010-16S12P Cable-Side View

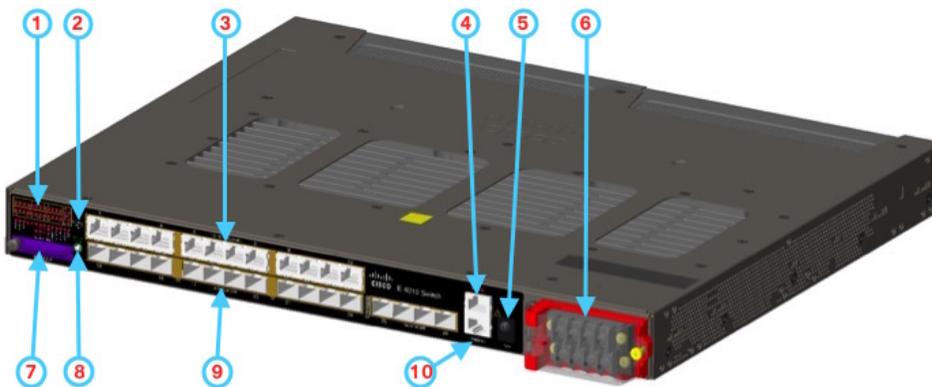


Table 2:

1	LEDs
2	Express Setup button
3	Twelve 10/100/1000 PoE/PoE+ Ports (Downlinks)
4	Alarm port
5	USB (mini-Type B) console port
6	Power-input terminal

7	Flash memory card slot
8	Display mode button
9	Twelve 100/1000 SFP Ports
10	Console port

For detailed information see [Port LEDs](#).

10/100/1000 PoE/PoE+ Ports (Downlinks)

You can set the 10/100/1000 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).



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 10/100/1000 PoE ports on the Cisco IE-4010 switches provide PoE support for devices that are compliant with IEEE 802.3af/802.3at. 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 30 W of PoE+ power. All twelve ports are PoE ports and can be assigned a port priority.

When both power-supply modules are installed, the system has enough power to support all twelve ports as PoE ports. The maximum available PoE power is 200W.

With one power module installed, the maximum available PoE power is 80W. In case one power-supply module 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 10/100/1000 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, on page 34](#).



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

Alarms

The switch has four alarm inputs and one alarm output.

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, or major. An alarm generates a system message and turns on an LED. See the ??? for the LED descriptions.

Alarm Output

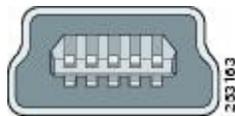
The alarm output can be configured as a major alarm. Output alarms often control an external alarm, such as a bell or a light. To connect an external alarm device to the relay, you connect two relay contact wires to complete the electrical circuit. See for information on the alarm pinouts. see the [Alarm Port](#), on page 63.

Mini USB Port



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.

Figure 2: 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.

SD Flash Memory Card

The switch supports a flash memory card that makes it possible to replace a failed switch without reconfiguring the new switch. The slot for the flash memory card is on the front of the switch. The flash card is hot swappable and can be accessed on the front panel in non hazardous locations only. A cover protects the flash card and holds the card firmly in place. The cover is hinged and closed with a captive screw. This prevents the card from coming loose and protects against shock and vibration.

For more information on inserting and removing the flash memory card, see [Power-Supply Side](#), on page 11.

Display Mode Button

The Display Mode Button allows you to choose the mode you want displayed by the port LEDs. The LEDs with green text to the left of the Button indicate the chosen display mode. Each time you press the switch, the mode indicator moves from SPEED, DUPLX, REDUN, SYNCE, and PoE respectively.

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, on page 37](#) for information.

Figure 3: Power-Input Terminal



100/1000 SFP Ports

The switch Ethernet SFP modules provide connections to other devices. These field-replaceable transceiver modules provide the interfaces. The IE 4010 supports both FE and GE optics. SFP modules have local connectors (LCs) for fiber-optic connections or RJ-45 connectors for copper connections.

For the most up-to-date list of supported SFP models, see the [IE 4010 Data Sheet](#).

For information about SFP modules, see your SFP module documentation and the [Installing and Removing SFP Modules, on page 28](#). For more information about SFP/SFP+ modules and cables, see [Transceiver Modules](#).

Console 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.

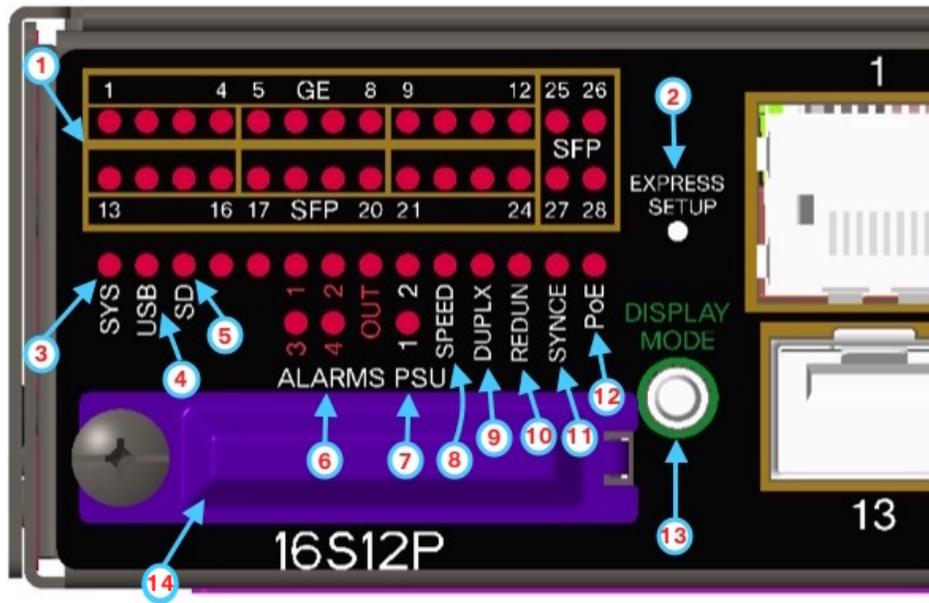
To use the USB console port, you must install the Cisco Windows USB device driver on the device that is connected to the USB console port (device running with Microsoft Windows). See [Installing the Cisco Microsoft Windows XP, 2000, Vista, 7, 8, and 10 USB Device Driver, on page 72](#) for more information.

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.

Switch Panel LEDs

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

Figure 4: Switch LEDs (Cable Side)



1	Port Status LEDs 1-28
2	Express Setup button
3	SYS (system)
4	USB (mini-USB console)
5	SD (SD flash memory card)
6	Alarm Status (1 to 4 and Output).
7	PSU1 and 2 (power supply 1 and 2)
8	Port speed status
9	Port duplex status
10	Redundancy status

11	Synchronous Ethernet status
12	PoE
13	Display mode switch
14	SD card slot cover

Port LEDs

Each Ethernet port has a port LED. These port LEDs, display information about the individual ports. The port mode determines the type of information shown by the port LEDs. The following table lists the mode LEDs and their associated port modes and meanings

Table 3: Port Mode LEDs

Mode LED	Port Mode	Description
All Off	Port status	The port status. This is the default mode.
SPEED	Port speed	The port operating speed: 10, 100, 1000 mbps or 10 Gbps.
DUPLX	Port duplex mode	The port duplex mode: full duplex or half duplex.
REDUN	Redundancy status	Parallel Redundancy Protocol (PRP) status.
SYNCE	Synchronous Ethernet status	Not supported by software yet. Mode button skips this LED.
PoE	PoE+ port power	The PoE+ port status.

To select or change a mode, press the Mode button until the desired mode is highlighted. The Mode LED will turn ON solid green when a mode is selected and turn OFF when timeout (5 seconds) or a different mode is selected. When you change port modes, the meanings of the port LED colors also change. The following table explains how to interpret the port LED colors in different port modes.

Table 4: Meaning of Switch LED Colors in Different Modes

Port Mode LED	Port LED Color	Meaning
All Off	Off	No link, or port was administratively shut down.
	Green	Link present, no activity.
	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 a link-fault indication.
	Amber	Port is blocked by Spanning Tree Protocol (STP) and is not forwarding data. After a port is reconfigured, the port LED can be amber for up to 30 seconds as STP checks the switch for possible loops.
Speed	10/100/1000/SFP ports	
	Downlink Ports	
	Off	Port is not operating.
	Amber	Port is operating at 10 Mb/s.
	Green	Port is operating at 100 Mb/s.
	Flashing green	Port is operating at 1000 Mb/s.
	Uplinks Ports	
	Green	Port is operating at 1000 Mb/s.
DUPLX (duplex)	Off	Port is not operating.
	Amber	Port is operating in half duplex.
	Green	Port is operating in full duplex.

Port Mode LED	Port LED Color	Meaning
REDUN	Green	One or more redundancy protocols are configured and active (for example, HSR, DLR, PRP, etc.)
	Blinking amber	One or more redundancy protocols are indicating a redundancy fault.
	Fast blinking green	The port LEDs are showing ports that are participating in a redundancy protocol and the redundancy fault status of that port.
SYNCE	Off	
PoE/PoE+	Off	PoE/PoE+ is off.
	Green	PoE/PoE+ is on and all ports function correctly. The port LED is green when the switch port is providing power.
	Alternating green and amber	PoE/PoE+ is on but one of the low priority ports power is disconnected or failed.
	Blinking amber	PoE/PoE+ is on but one of the high priority ports power is disconnected or failed. PoE+ faults occur when noncompliant cabling or powered devices are connected to a PoE+ port. Use only standard-compliant cabling to connect Cisco prestandard IP Phones and wireless access points or IEEE 802.3af/at-compliant devices to PoE+ ports. You must remove from the network any cable or device that causes a PoE+ fault.
	Amber	PoE/PoE+ is on with failures. PoE+ is enabled by default

Display Mode Button

The Display Mode Button allows you to choose the mode you want displayed by the port LEDs. The LEDs with green text to the left of the Button indicate the chosen display mode. Each time you press the switch, the mode indicator moves from SPEED, DUPLX, REDUN, SYNCE, and PoE respectively.

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.

Table 5: 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	Power-supply module (1 or 2) is installed but valid input is not present.

Alarm LEDs

Table 6: Alarm LEDs

Color	System Status
1-4 Input Alarms	
Green	Alarm not present
Red	Minor alarm present
Blinking red	Major alarm present
Output Alarm	
Green	Alarm not present
Red	Alarm condition present

SD Flash Memory Card LED

Table 7: SD Flash Card LED

Color	System Status
Fast blinking amber	Unsupported SD flash memory card is detected.
Slow blinking amber	SD flash memory card is not present.
Green	SD flash memory card is functioning.
Blinking green	SD flash memory card transfer in progress.

USB LED

The USB LED indicates the console port is in use.

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

Table 8: USB console port LED

Green	USB console port selected
Off	RS232 Console selected

System LED

Table 9: System LED

Color	System Status
Off	System is not powered on.
Blinking green	Power-On Self-Test (POST) is in progress.
Green	System is operating normally.
Red	System is receiving power but is not functioning properly

Power-Supply Side

The power-supply side has the LED panel and two power-supply slots for the removable power supplies.

Figure 5: Switch with Both Power-Supply Modules

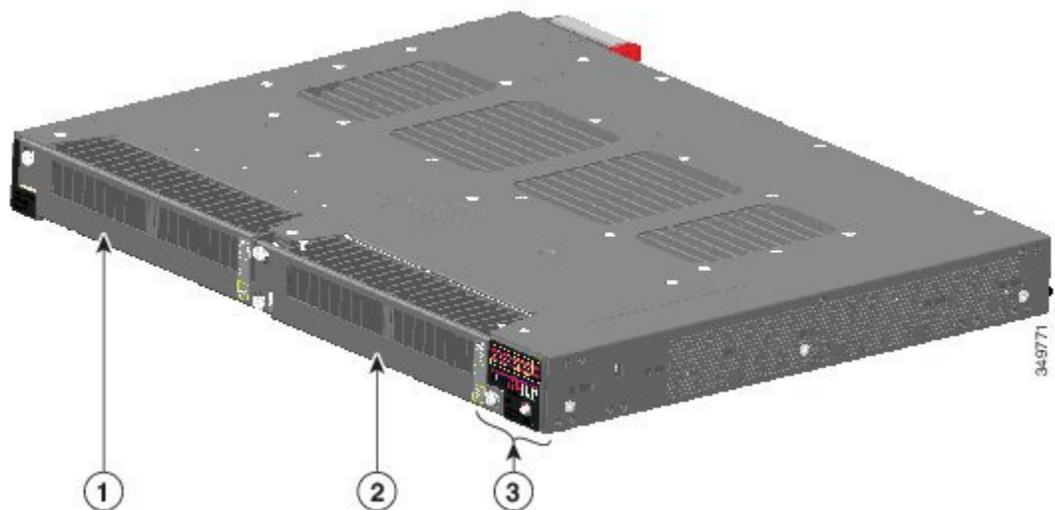


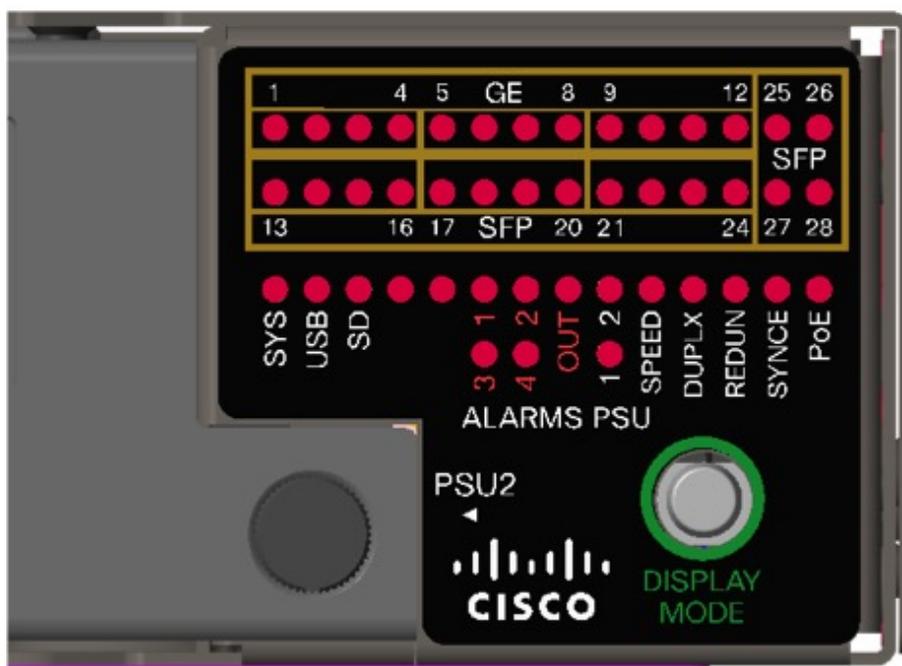
Table 10:

1	Power Supply slot 1
2	Power Supply slot 2
3	LED panel

Power-Supply Side LEDs

These are Similar to Switch LEDs (Cable Side).

Figure 6: Switch LEDs



1-28	Port (Ethernet and SFP respectively) Status LEDs
SYS	System Status
USB	Mini-USB console port status
SD	SD flash memory card status
Alarms 1-4 and OUT	Alarm ports and Alarm Output status
PSU 1-2	Power supply 1 and 2 status
SPEED	Port speed status
DUPLX	Port duplex status

REDUN	Redundancy status
SYNCE	Synchronous Ethernet status
PoE	PoE status
DISPLAY MODE	Display Mode button

For more information about these LEDs, see [Switch Panel LEDs, on page 6](#).

Power Supply Features

The switch has two slots for power-supply modules:

- PWR-RGD-LOW-DC-H: low-voltage DC
- PWR-RGD-AC-DC-H: high-voltage AC or DC

Note: [For detailed specifications, see the IE 4010 Data Sheet](#).



Caution Only the -H version power supplies are certified safe for hazardous environments.

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, on page 37](#).

See [Power-Supply Module LEDs, on page 10](#) 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. 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.

Device Manager

- You can use Device Manager, which is in the switch memory, to manage individual and standalone switches. This web interface offers quick configuration and monitoring. You can access Device Manager from anywhere in your network through a web browser. For more information, see the Device Manager online help.

Prime Infrastructure

- Cisco Prime Infrastructure simplifies the management of wireless and wired networks. It offers Day 0 and 1 provisioning, as well as Day N assurance from the branch to the data center. We call it One Management. With this single view and point of control, you can reap the benefits of One Management across both network and compute.

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.



CHAPTER 2

Switch Installation

This chapter contains the following sections:

- [Warnings, on page 15](#)
- [Installation Guidelines, on page 17](#)
- [Verifying Switch Operation, on page 17](#)
- [Installing the Switch, on page 17](#)

Warnings

These warnings are translated into several languages in the Regulatory Compliance and Safety Information for the Cisco IE 4010 Switch document.

These warning statements apply to all the switches:



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43



Warning Read the installation instructions before you connect the system to its power source. Statement 1004



Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017



Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024



Warning This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028



Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030



Warning Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040



Warning For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection. 10/100/1000 Ethernet Statement 1044



Warning To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of :
140°F (60°C) Statement 1047



Note Operating temperatures exceeding 60C are not covered by the product safety certifications and approvals. However, the switch can function in the installations under the environmental conditions listed Switch Specifications.



Warning Installation of the equipment must comply with local and national electrical codes. Statement 1074



Note For U.S. installations, refer to national electrical code ANSI/NFPA 70.



Warning To prevent airflow restriction, allow clearance around the ventilation openings to be at least: 1.75 in. (4.4 cm). Statement 1076



Warning Avoid using or servicing any equipment that has outdoor connections during an electrical storm. There may be a risk of electric shock from lightning. Statement 1088

Installation Guidelines

Before installing the switch, verify that these guidelines are met:

- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure that the cabling is away from other devices that might damage the cables.
- Operating environment is within the ranges listed in [Technical Specifications, on page 77](#).
- Relative humidity around the switch does not exceed 95 percent (non-condensing).
- Altitude at the installation site is not higher than 13,800 feet.
- For 10/100/1000 fixed ports, cable lengths from the switch to connected devices are not more than 328 feet (100 meters).
- For more information about SFP/SFP+ modules and cables, see [Transceiver Modules](#).
- Airflow around the switch and through the vents is unrestricted. To prevent overheating, the switch must meet the minimum clearance of 1.75 inches (4.4 cm) at the top and bottom.



Note If the switch is installed in a closed or multirack assembly, the temperature around it might be greater than normal room temperature. Ensure that the internal temperature does not exceed the maximum ambient temperature specifications for the switch.

Verifying Switch Operation

Before installing the switch in a rack or on a wall, you should power the switch and verify that the switch passes the power-on self-test (POST).

To wire the switch to the power source, see [Power-Supply Module Installation, on page 39](#).

When the switch begins POST, the SYS LED blinks green, and the other LEDs stay green. When the switch passes POST, the SYS LED turns green. The other LEDs turn off and return to their operating status. If the switch fails POST, the SYS LED is amber



Note Contact Cisco Systems immediately if your switch fails POST.

After a successful POST, disconnect the power from the switch. For more information, see [Wiring the Power Source, on page 44](#). See [Switch Installation, on page 15](#) to install the switch in a rack or on a wall.

Installing the Switch

The switch can be installed by:

- Rack-Mounting

- Wall-Mounting

Rack-Mounting

To rack-mount the switch, select the rack size and follow the steps in these sections:



Warning To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006



Warning For mounting railway-application equipment and for EN50155 standard compliance, the switch must be installed only in a rack mid-mounting position. If you install the switch in a front rack-mounting (cable side or power supply side) position or in a wall-mounting position, a mechanical failure can occur that results in the switch becoming detached from the rack. Statement 403

Attaching Brackets for 19-Inch Racks

The following illustrations show how to attach brackets to the switches.

Figure 7: Attaching Brackets for 19-Inch Racks (Front bracket)

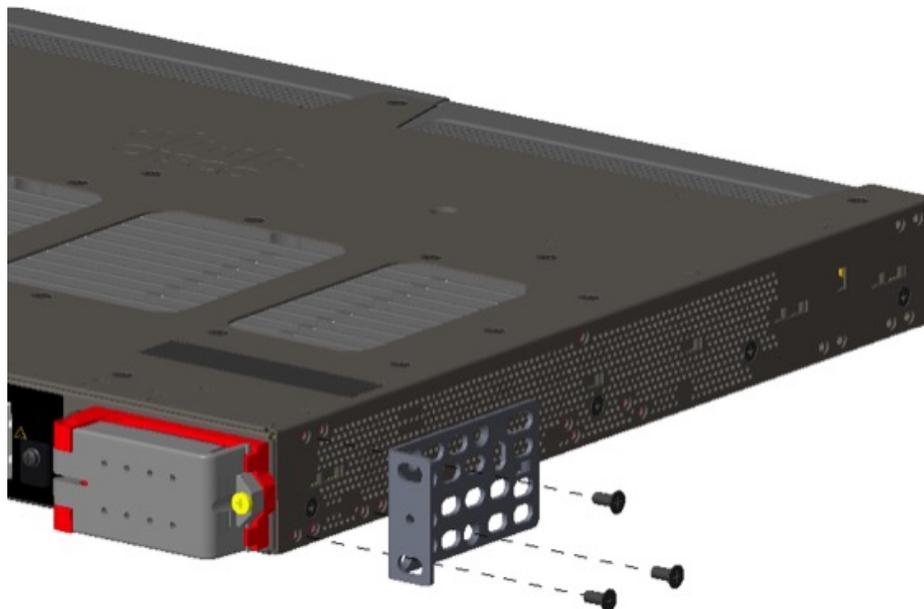
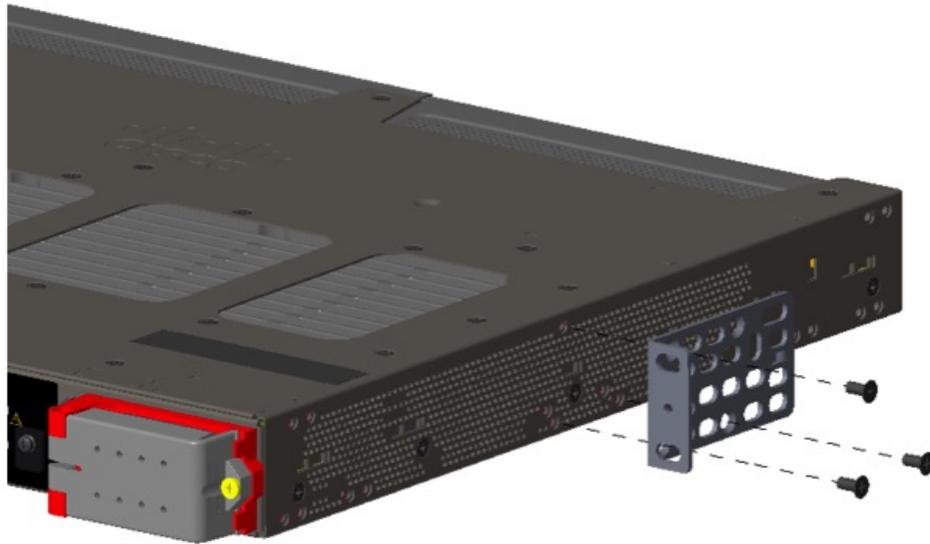


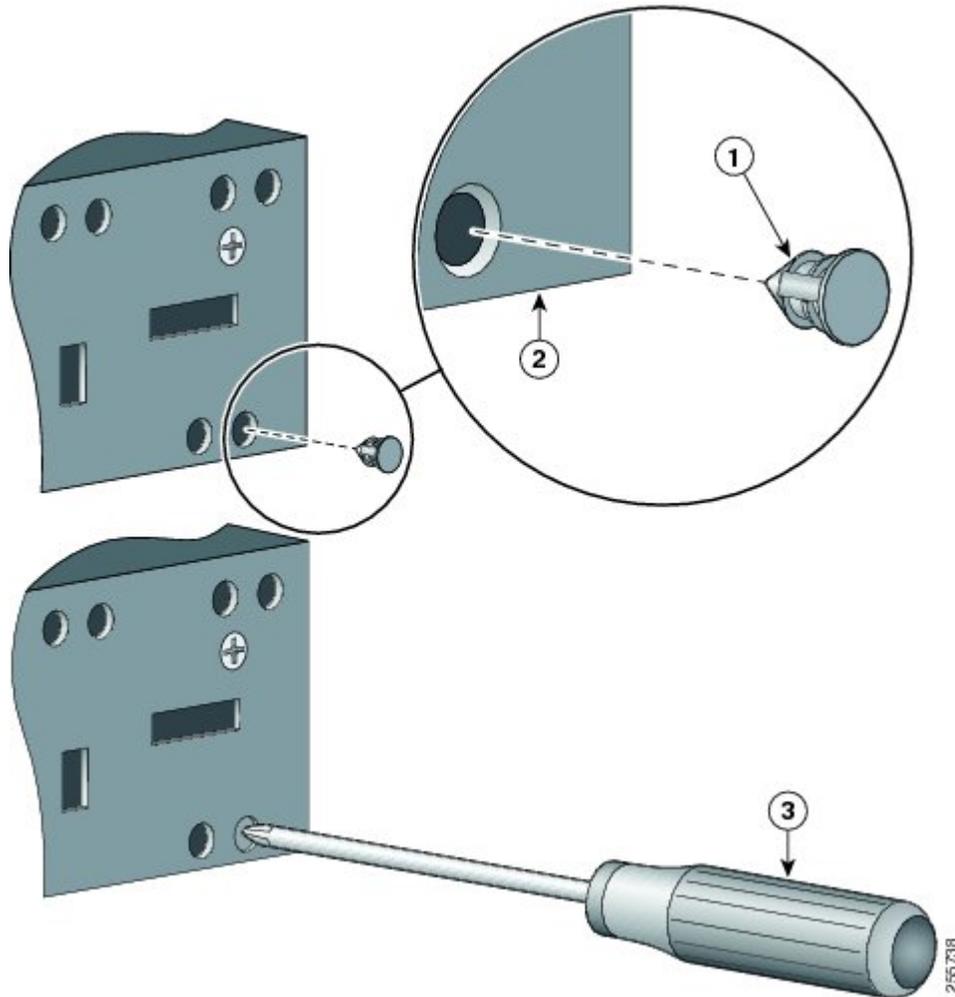
Figure 8: Attaching Brackets for 19-Inch Racks (Rear Mount)



Attaching Brackets for 19-Inch Racks for IP-30 Compliance (Optional)

Before installing the mounting brackets, you need to install the rubber plugs in the unused mounting holes. The following figure shows a close-up of the rubber plug. You can install the rubber plugs in the holes as shown in the next figure.

Figure 9: Inserting the Rubber Plug



1	Rubber plug
2	Switch
3	Screwdriver

1. Identify your bracket mounting position. See [Attaching Brackets for 19-Inch Racks](#), on page 18.
2. Insert the rubber plugs in the appropriate holes on both sides of the switch.
3. Use a screwdriver or pen to completely push in the rubber plugs.
4. Install the brackets on both sides of the switch. See [Attaching Brackets for 19-Inch Racks](#), on page 18.

Figure 10: Plug locations by position



Note For IP-30 compliance: If you use 23-inch brackets or ETSI brackets, you can insert the rubber plugs in the same holes as shown in the figure above before installing the brackets.

Attaching Brackets for 23-Inch Racks

If 23-inch brackets (RM-RGD-23IN=) are required, follow steps in the following figure for installation.



Note 23-inch and ETSI brackets should not be used in high vibration environments, including any railway application (EN50155).



Note For IP-30 compliance: If you use 23-inch brackets or ETSI brackets, you can insert the rubber plugs in the same holes as shown in Figure 11 ??? before installing the brackets.

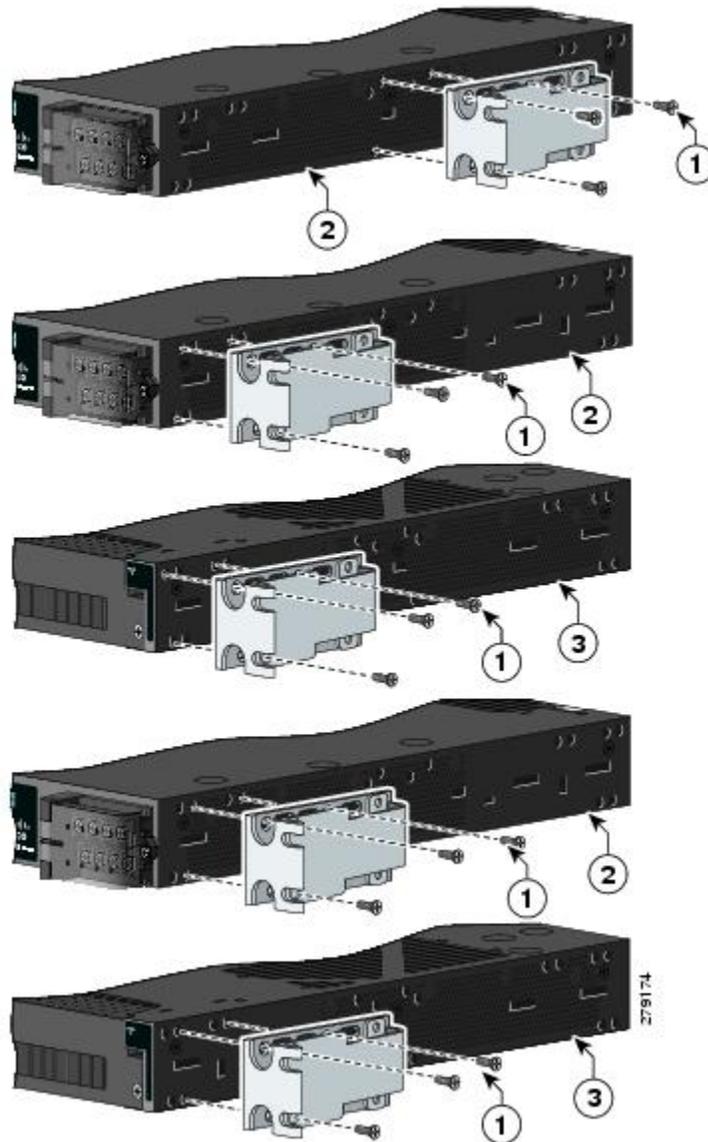
Figure 11: Attaching 23-Inch Brackets



Note For IP-30 compliance: If you use 23-inch brackets, you can insert the rubber plugs in the same holes as shown in [Attaching Brackets for 19-Inch Racks](#), on page 18 before installing the brackets.

Attaching Brackets for ETSI Racks

Figure 12: Attaching Brackets (RM-RGD-ETSI=) for ETSI Racks



1	Phillips flat-head screws
2	Cable-side-mounting position
3	Power-supply-side mounting position



Note 23-inch and ETSI brackets should not be used in high vibration environments, including any railway application (EN50155).

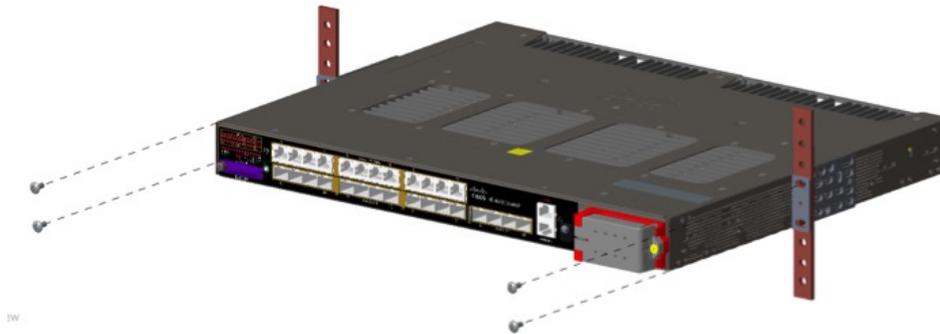


Note For IP-30 compliance: If you use ETSI brackets, you can insert the rubber plugs in the same holes as shown in Figure 11 before installing the brackets.

Rack-Mounting the Switch

After you attach the brackets on the switch, attach the brackets to the rack.

Figure 13: Rack-Mounting



After the switch is mounted in the rack:

1. Wire the switch to a power source. See [Wiring the Power Source, on page 44](#).
2. Connect the ports. See [Connecting Devices to the Ethernet Ports, on page 34](#).
3. Attach the cable guide to prevent the cables from obscuring the LED panels on the devices in the rack. Use the supplied black screw to attach the cable guide to the left or right bracket.

For configuration instructions about the CLI setup program, see [Configuring the Switch with the CLI Setup Program, on page 65](#).

Wall-Mounting



Warning Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378



Warning For mounting railway-application equipment and for EN50155 standard compliance, the switch must be installed only in a rack mid-mounting position. If you install the switch in a front rack-mounting (cable side or power supply side) position or in a wall-mounting position, a mechanical failure can occur that results in the switch becoming detached from the rack. Statement 403

If the switch is wall-mounted in an enclosure, follow these minimum clearances:

- Sides of switch (facing up and facing down): 3.75 in. (9.52 cm)
- Port side 3.0 in. (7.62 cm)
Power supply side: 5.25 in. (13.33 cm)
Cover side (not facing wall): 1.75 in. (4.44 cm)
Base side (facing wall): 0 in. (0 cm)

To wall-mount the switch, follow the steps in these sections:

Attaching Brackets

Figure 14: Attaching 19-inch Rack Brackets



1	Phillips truss-head screws
---	----------------------------

Attaching Brackets for IP-30 Compliance (Optional)

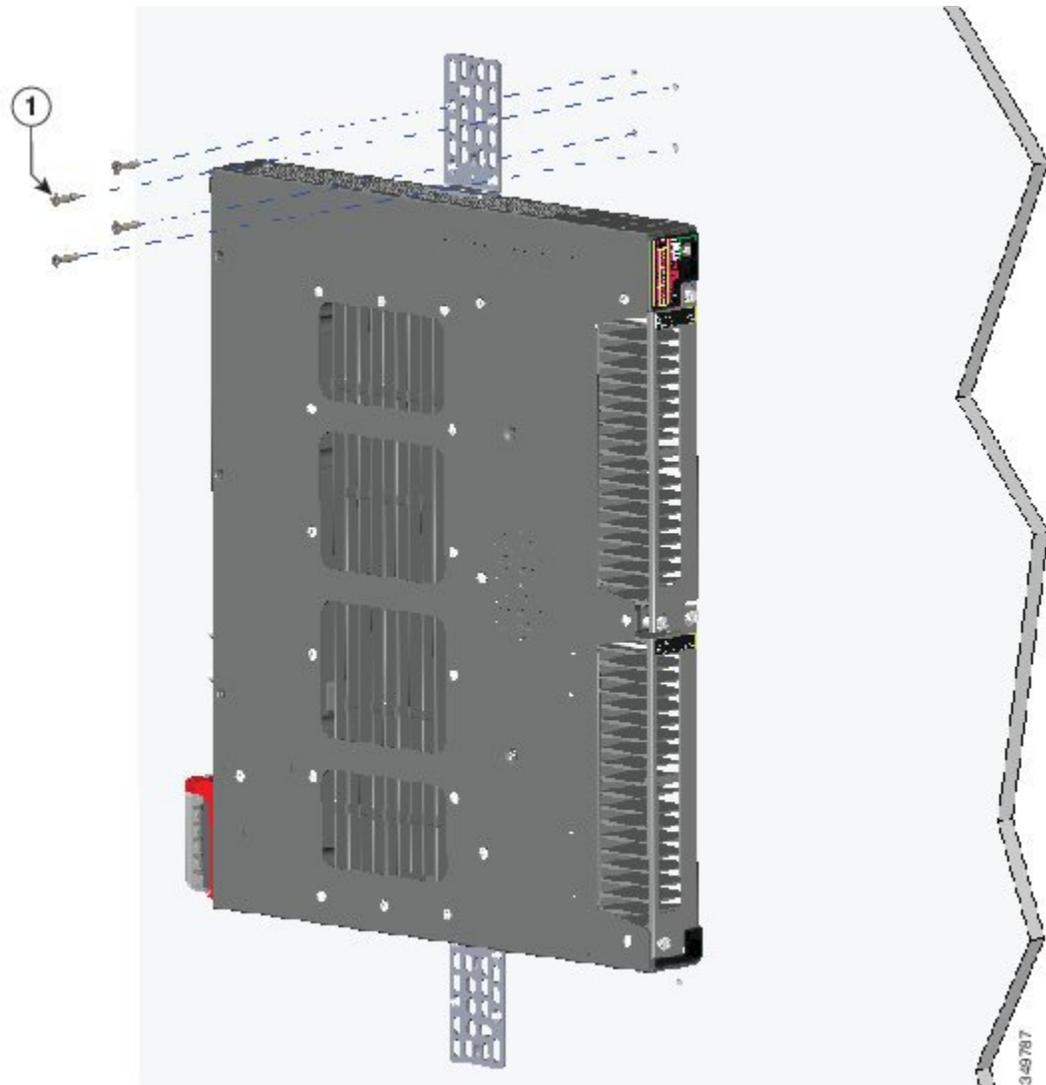
1. Insert the rubber plugs in the appropriate holes on both sides of the switch.
2. Use a screwdriver or pen to completely push in the rubber plugs.
3. Install the brackets on both sides of the switch.

Wall-Mounting the Switch

For the best support of the switch and cables, ensure that the switch is attached securely to wall studs or to a firmly attached plywood mounting backboard.

Orientation should exactly match the figure below, with power terminal down, the LEDs up, and the venting and Cisco Logo facing away from the wall. See the following figure.

Figure 15: Wall-Mounting



1	User-supplied screws
---	----------------------

After the Switch is Mounted on the Wall

- Wire the switch to a power source. See [Wiring the Power Source, on page 44](#).
- For configuration instructions about using the CLI setup program, go to [Configuring the Switch with the CLI Setup Program, on page 65](#).
- Connect the switch ports. See [Connecting Devices to the Ethernet Ports, on page 34](#).

Installing and Removing SFP Modules

This section presents procedures to install and remove fiber-optic and 1000BASE-T SFP transceiver modules.

Installing SFP Modules

These sections describe how to install and remove SFP modules. SFP modules are inserted into SFP module slots on the front of the switch. Field-replaceable SFP modules provide the uplink interfaces, send (TX) and receive (RX).

You can use any combination of rugged SFP modules. Each SFP module must be of the same type as the SFP module on the other end of the cable, and the cable must not exceed the stipulated cable length for reliable communications.

For more information about SFP modules, see [Cisco Transceiver Modules](#).



Warning Do not insert and remove SFP modules while power is on; an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding. Statement 1087



Caution Depending on the SFP module you use, the operating temperature limits may be effected. Choose an SFP module appropriate to the installed environment.



Caution To prevent electrostatic-discharge (ESD) damage, follow standard board and component handling procedures.



Caution Do not install or remove the LC SFP module with fiber-optic cables attached because of potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module.



Note Removing and installing an SFP module can shorten its useful life. Do not remove and insert any module more often than is absolutely necessary.

Installing Fiber Optic SFP Modules



Warning Class 1 laser product. Statement 1008

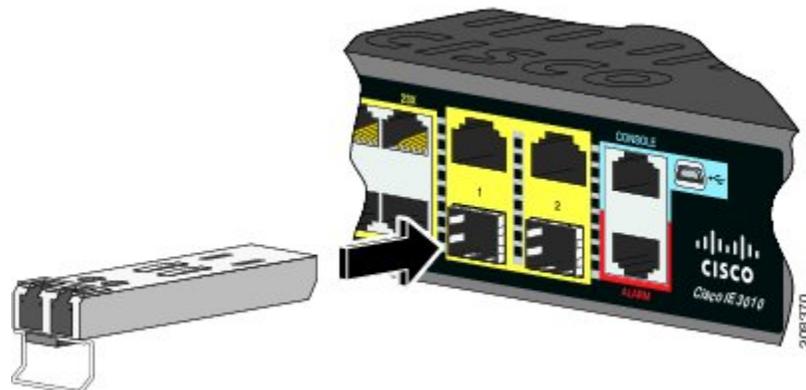
To install and cable an optical SFP transceiver uplink port:

1. Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
2. Find the send (TX) and receive (RX) markings on the module top.

On some SFP modules, the send and receive (TX and RX) markings might be replaced by arrows that show the direction of the connection, either send or receive (TX or RX).

3. If the module has a bale-clasp latch, move it to the open, unlocked position.
4. Align the module in front of the slot opening, and push until you feel the connector snap into place.
5. If the module has a bale-clasp latch, close it.
6. For fiber-optic SFP modules, remove the dust plugs and save.
7. Connect the SFP cables.

Figure 16: Installing an SFP Module



Caution Do not remove the dust plugs from the fiber-optic SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

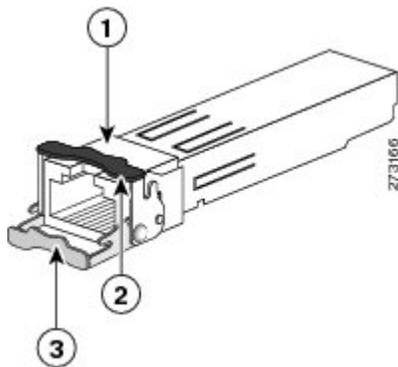
Installing 100/1000BASE-T SFP Modules

Table 11: 100/1000BASE-T SFP Modules

Model Number	Downlink Support	Uplink Support
GLC-T	10/100/1000	10/100/1000
GLC-TE	10/100/1000	10/100/1000

The 100/1000BASE-T (copper) SFP transceiver, seen in the following figure, has a bale-clasp locking mechanism that secures the transceiver in the module socket. The SFP network interface is an RJ-45 connector.

Figure 17: 1000BASE-T SFP Transceiver



1	RJ-45 connector
2	Bale-clasp latching mechanism in the closed (locked) position.
3	Bale-clasp latching mechanism in the open (unlocked) position.



Caution To comply with GR-1089 intrabuilding lightning immunity requirements, you must use grounded, shielded, twisted-pair, CAT5 cabling.



Note When connecting to a 100/1000BASE-T-compatible server, workstation, or router, use four twisted-pair, straight-through CAT5 cabling for the SFP transceiver port. When connecting to a 100/1000BASE-T-compatible switch or repeater, use four twisted-pair, crossover CAT5 cabling.

To install a 100/1000BASE-T SFP transceiver:

1. Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector on the chassis or to a properly grounded bare metal surface.



Caution To avoid ESD damage, handle the SFP by its sides; do not touch the connector pins.

2. Remove the SFP module from its protective packaging.
3. Check the markings on the SFP transceiver to verify that you have the correct model for your network.
4. Position the SFP transceiver in front of the port socket opening



Note Different Cisco devices have different SFP transceiver socket configurations. Your Cisco device might require that the SFP transceiver be installed with the bale-clasp either in a latch-up or a latch-down orientation. Verify that you have the SFP transceiver oriented correctly when you position it in front of the port socket.

5. With the bale-clasp closed (locked), slide the SFP transceiver into the socket until you feel it snap in place in the socket. You may hear an audible click as the SFP transceiver latch engages in the socket.
6. Connect the network interface cable RJ-45 plug to the SFP RJ-45 connector.
7. Observe the port status LED:
 - Green indicates that the SFP transceiver and the target device established a link.
 - Amber indicates that the port is discovering the network topology and searching for loops. This process takes about 30 seconds, and then the LED turns green.
 - Off indicates that the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. Refer to [Troubleshooting, on page 49](#) for solutions to cabling problems.

Connecting to SFP Modules

This section describes how to connect to a fiber-optic or 1000BASE-T SFP port. For instructions on how to install or remove an SFP module, see [Connecting Devices to the Ethernet Ports, on page 34](#).



Warning Class 1 laser product. Statement 1008



Warning Do not connect or disconnect cables to the ports while power is applied to the switch or any device on the network because an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed from the switch and cannot be accidentally be turned on, or verify that the area is nonhazardous before proceeding. Statement 1070



Caution Do not remove the rubber plugs from the SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.



Caution To prevent ESD damage, follow standard board and component handling procedures.

Before connecting to the SFP module, be sure that you understand the port and cabling guidelines in [Installing and Removing SFP Modules, on page 28](#). See [Cable and Connectors, on page 61](#) for information about the LC on the SFP module.

Connecting to a Fiber Optic SFP Module

To connect a fiber-optic cable to an SFP module:

1. Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.
2. Insert one end of the fiber-optic cable into the SFP module port.
3. Insert the other cable end into a fiber-optic receptacle on a target device.
4. Observe the port status LED:
 - The LED turns green when the switch and the target device have an established link.
 - The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
 - If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. See [Troubleshooting for solutions to cabling problems](#)
5. If necessary, reconfigure and restart the switch or the target device

Connecting to a 1000BASE-T SFP Module



Caution To prevent ESD damage, follow standard board and component handling procedures.

To connect a CAT5 cable to a 1000BASE-T SFP module:

1. When connecting to servers, workstations, and routers, insert a four twisted-pair, straight-through cable in the RJ-45 connector. When connecting to switches or repeaters, insert a four twisted-pair, crossover cable.



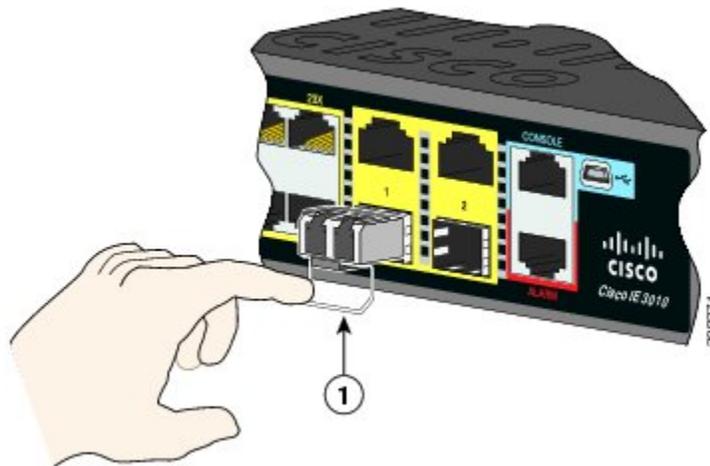
Note When connecting to a 1000BASE-T device, use a four twisted-pair CAT5 cable.

2. Insert the other cable end in an RJ-45 connector on a target device.
3. Observe the port status LED:
 - The LED turns green when the switch and the target device have an established link.
 - The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
 - If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. See [Troubleshooting, on page 49](#) for solutions to cabling problems.
4. If necessary, reconfigure and restart the switch or the target device.

Removing SFP Modules

1. Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
2. Disconnect the cable from the SFP module. For reattachment, note which cable connector plug is send (TX) and which is receive (RX).
3. Insert a dust plug into the optical ports of the SFP module.
4. If the module has a bale-clasp latch, pull the bale out and down to eject it. If the latch is obstructed and you cannot use your finger, use a small, flat-blade screwdriver or other long, narrow instrument.
5. Grasp the SFP module, and carefully remove it from the slot.
6. Place the module in an antistatic bag or other protective environment.

Figure 18: Removing a Bale-Clasp Latch SFP Module



1	Bale clasp
---	------------

Replacing the SD Flash Memory Card

1. Locate the flash memory card slot on the cable-side of the switch.
2. Loosen the captive thumb screw. (Be careful not to cross-thread or over-tighten the thumb screw.)
3. Pull the cover open, and pull the cover tab from the hinge.
4. Gently push the flash memory card to eject it. Place it in an anti-static bag to protect it from static discharge.
5. Push the replacement card into the slot, and press it firmly in place. The card is keyed so that you cannot insert it the wrong way.
6. Place the flash card slot cover tabs into the hinge.
7. Close the cover, and hand-tighten the screw.

Connecting Devices to the Ethernet Ports

The Ethernet ports use standard RJ-45 connectors with Ethernet pinouts. The maximum cable length is 328 feet (100 meters). The 100BASE-TX and 1000BASE-T traffic requires Category 5, Category 5e, or Category 6 UTP cable. The 10BASE-T traffic uses Category 3 or Category 4 cable.

The autonegotiation feature is enabled by default on the switch. At this setting, the switch ports configure themselves to operate at the speed of the attached device. If the device does not support autonegotiation, you can set the switch port speed and duplex parameters. To maximize performance, either let the ports autonegotiate both speed and duplex, or set the port speed and duplex parameters on both ends of the connection.

For simplified cabling, the automatic medium-dependent interface crossover (auto-MDIX) feature is enabled by default. With auto-MDIX enabled, the switch detects the required cable type for copper Ethernet connections and configures the interface accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a Ethernet port, regardless of the type of connected device.

See the switch software configuration guide or the switch command reference on Cisco.com for more information about autonegotiation and auto-MDIX.

If auto-MDIX is disabled, use the guidelines in [Cable and Connectors, on page 61](#) to select the cable for connecting the Ethernet ports to other devices.

When using PoE/PoE+, those ports have the same autonegotiation settings and cabling requirements as those in [Connecting Devices to the Ethernet Ports, on page 34](#). These ports provide PoE power.

See [Cable and Connectors, on page 61](#) for information on the cables and connectors.

The ports provide PoE/PoE+ support for devices compliant with IEEE 802.3af/at and also provide Cisco prestandard PoE/PoE+ support for Cisco IP Phones and Cisco Aironet Access Points.

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

To access an advanced PoE planning tool, use the Cisco Power Calculator on Cisco.com:

<http://tools.cisco.com/cpc/launch.jsp>

You can use this application to calculate the power supply requirements for a specific PoE/PoE+ configuration. The results show output current, output power, and heat dissipation.



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



Caution Category 5e and Category 6 cables can store high levels of static electricity. Always ground the cables to a suitable and safe earth ground before connecting them to the switch or other devices.

Where to Go Next

You can use the default configuration or use any of the management options described in [Management Options](#), on page 13 to change the switch settings.



CHAPTER 3

Power Supply Installation

This chapter describes how to remove and install a new or replacement power supply. Your switch ships with at least one installed power-supply module (AC or DC, depending on your order).

The power-supply modules are field-replaceable units (FRUs) and are hot-swappable when deployed in non-hazardous locations.

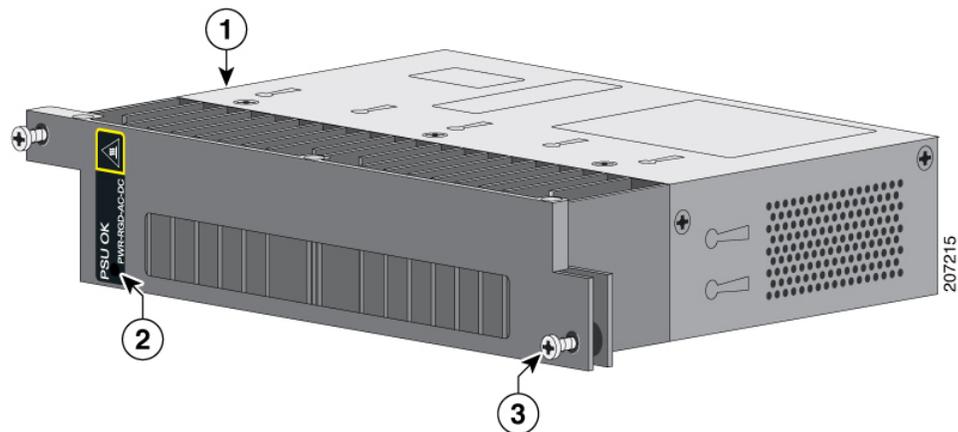
For translations of the safety warnings in this chapter, see the *Regulatory Compliance and Safety Information for the Cisco IE 4010 Switch* on Cisco.com.

- [Power-Supply Modules, on page 37](#)
- [Power-Supply Module Installation, on page 39](#)

Power-Supply Modules

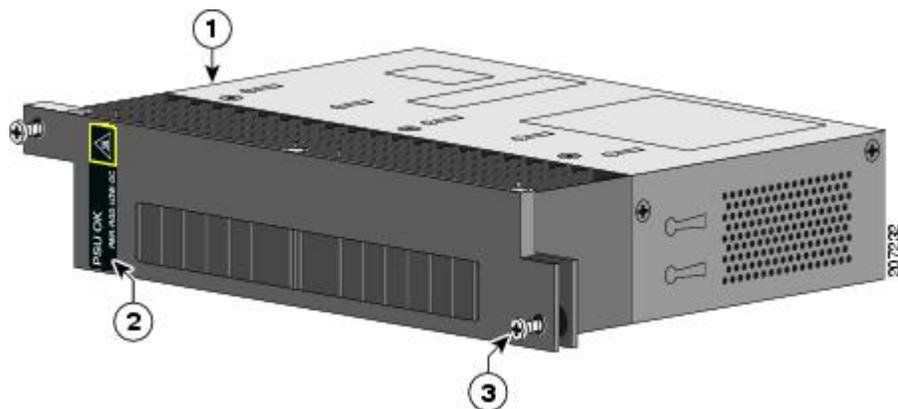
Model	Description
PWR-RGD-LOW-DC-H	Low-voltage DC. For detailed specifications, see the IE 4010 Data Sheet.
PWR-RGD-AC-DC-H	High-voltage AC or DC. For detailed specifications, see the Cisco Industrial Ethernet 4010 Series Switches Data Sheet .

Figure 19: PWR-RGD-AC-DC-H Power-Supply Module



1	Power-supply module
2	PSU OK LED
3	Captive screw

Figure 20: PWR-RGD-LOW-DC-H Power-Supply Module



1	Power-supply module
2	PSU OK LED
3	Captive screw



Note Power Supplies with the -H suffix are required for hazardous environment installations. Non hazardous environments may use either -H or non -H supplies.

For a description of the PSU OK LEDs, see [Power-Supply Module LEDs](#), on page 10.

Power-Supply Module Installation

This section contains the following topics:

Installation Guidelines

Observe these guidelines when removing or installing a power-supply module:

A power-supply module that is only partially connected to the switch disrupts the system operation.



Warning Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029



Warning Do not reach into a vacant slot while installing or removing a module. Exposed circuitry is an energy hazard. Statement 206



Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030



Warning Avoid using or servicing any equipment that has outdoor connections during an electrical storm. There may be a risk of electric shock from lightning. Statement 1088

Installing a Power-Supply Module

This procedure is for installing a power-supply module in the PSU1 or PSU2 slot.



Warning The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed. Statement 1077



Warning This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028



Caution Equipment installation must comply with local and national electrical codes.

Equipment That You Need

- Torque driver(s) capable of 5 to 35 in-lbs
- Ring, spade, or flanged spade terminal (terminals should be insulated)
 - Ring terminal (such as Tyco part number 2-34158-1 for 16 – 14 AWG or 2-34852-1 for 12 – 10 AWG wire)
 - Spade terminal (such as Tyco part number 54367-2 for 16 – 14 AWG wire)
 - Flanged spade terminal (such as Tyco part number 2-324165-1 for 16 – 14 AWG wire or 1-324581-1 for 12 – 10 AWG wire)
- Use the 16-14 AWG wire and appropriate terminals for the AC or high-voltage DC power supply
- Use the 12-10 AWG wire and appropriate terminals for the low-voltage DC power supply
- Crimping tool (such as Thomas & Bett part number WT2000, ERG-2001)
- 6-gauge copper ground wire
- 12-AWG wire (minimum) for the low-voltage power-supply module and 16-AWG (minimum) wire for the high-voltage power-supply module
- For power source connections, use wires rated for at least 194°F (90°C).
- UL- and CSA-rated style 1007 or 1569 twisted-pair copper wire
- Wire-stripping tools for stripping 6-, 10-, 12-, 14-, and 16-gauge wires.
- Number-2 Phillips screwdriver
- Flat-blade screwdriver

Obtain these necessary tools and equipment:

- Ratcheting torque screwdriver with a number-2 and a number-1 Phillips head that exerts up to 15 pound-force inches (lbf-in.) or 240 ounce-force inches (ozf-in.) of pressure.
- Panduit crimping tool with optional controlled-cycle mechanism (model CT-720, CT-920, CT-920CH, CT-930, or CT-940CH).
- Wire-stripping tools.
- 12-gauge copper ground wire (insulated or noninsulated) when using the single-ground connection.
- 6-gauge copper ground wire (insulated or noninsulated) when using the dual-ground connection.
- For the dual ground connection, also use the supplied dual-hole lug from the accessory kit.
- Four leads of 16-gauge copper wire.

Grounding the Switch

Follow the grounding procedures at your site and observe these warnings:



Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024



Warning When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046



Caution Follow the grounding procedure instructions, and use an appropriately Listed or certified lug (included with the switch) for number-6 AWG wire and 10-32 ground-lug screws.

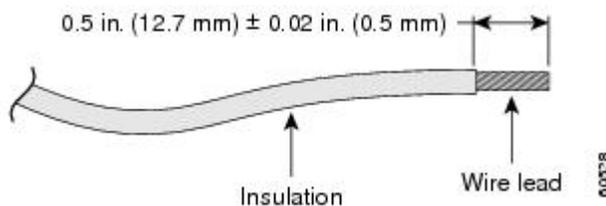


Note You can use the grounding lug to attach a wrist strap for ESD protection during servicing.

Follow these steps to install a dual-hole lug on the switch. Be sure to follow any grounding requirements at your site.

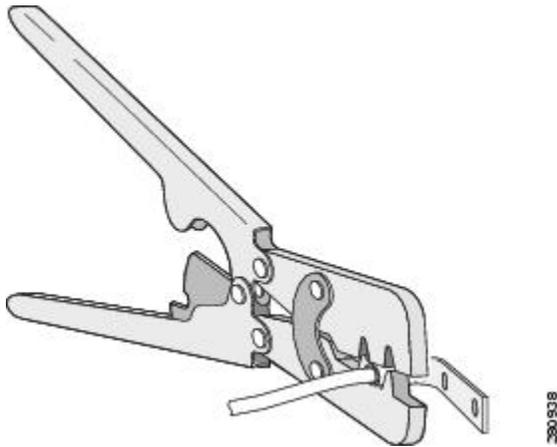
- Step 1** Use a Phillips screwdriver or a ratcheting torque screwdriver with a Phillips head to remove the ground screw from the cable side of the switch. You need the screw in Step 4.
- Step 2** Strip the 6-gauge ground wire to 0.5 inch (12.7 mm) \pm 0.02 inch (0.5 mm). Stripping more than the recommended amount of wire can leave exposed wire from the connector.

Figure 21: Stripping the Ground Wire



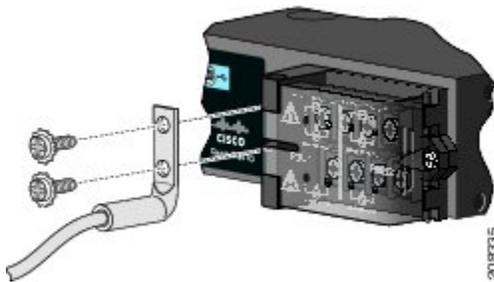
- Step 3** Insert the ground wire into the terminal lug, and crimp the terminal to the wire.

Figure 22: Crimping the Terminal Lug



Step 4 Slide the ground screw from Step 1 through the terminal lug. Insert the ground screws into the opening on the cable side.

Figure 23: Attaching the Terminal Lug



1	Dual-hole terminal lug
---	------------------------

Step 5 Use a ratcheting torque screwdriver to tighten the ground screws to 30 in-lb (± 2 in-lb).

Step 6 Attach the other end of the ground wire to an appropriate ground.

Installing the Power-Supply Module in the Switch

Step 1 Ensure that the power is off at the AC or DC circuits.

Locate the circuit breakers, turn them OFF, and lock out the circuit.

Warning If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

Step 2 Use a Phillips screwdriver to loosen the two captive screws of the blank power-supply module and gently pull it out. See the following figures.

Figure 24: Loosen the Screws on the Power Supply Blank



Figure 25: Remove the Power Supply Blank



Step 3 Insert the power-supply module into the slot, and gently push it in.

Note Ensure that the power supply module is flush with the switch.

Installing the DC Power Supply in the Switch

To remove and install a DC-powered power supply module, follow these steps:

- Step 1** Turn off power at the DC circuits. To ensure that power is removed from the DC circuits, locate the circuit breakers for the DC circuits, switch the circuit breakers to the OFF position, and tape the circuit-breaker switches in the OFF position.
- Step 2** Use a number-2 Phillips screwdriver to remove the plastic safety cover from the power supply terminal blocks.
- Step 3** Use a number-1 Phillips screwdriver to remove the DC-input power wires from the power terminals.
- Step 4** Use a Phillips screwdriver to loosen the two captive screws at the lower edge that secure the power supply module to the switch chassis
- Step 5** Remove the power supply module from the power slot by pulling on the extraction handle.
- Step 6** Insert the new power supply into the power supply slot, and gently apply pressure while pushing the module into the slot. See the following figure. When correctly inserted, the power supply is flush with the switch rear panel.

Figure 26: Insert the Power-Supply Module



Step 7 Use a ratcheting torque screwdriver to torque each screw to 8–10 in-lb.

Wiring the Power Source

Before you wire the power source, review these warnings:



Warning This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: AC: 20 A, DC: 15 A Statement 1005



Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022



Warning Only trained and qualified personnel should be allowed to install or replace this equipment. Statement 1030



Warning Hazardous voltage or energy may be present on power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1086

Step 1 Ensure that the power is off at the AC or DC circuits.

Locate the circuit breakers, turn them OFF, and lock out the circuit.

Warning If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

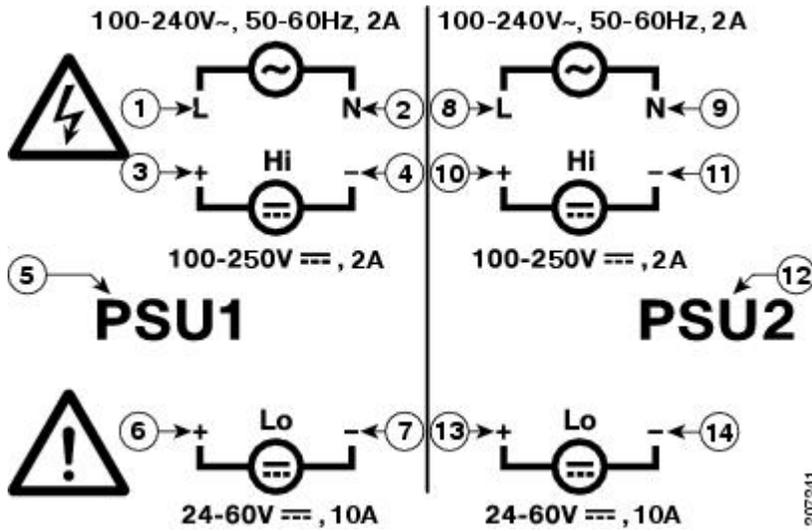
Step 2 Use a Phillips screwdriver to loosen the captive screw on the power-input terminal, and open the cover.

Figure 27: Opening the Power-Input Terminal Cover



The terminal screws labels are on the power-input terminal cover.

Figure 28: Power-Input Terminal



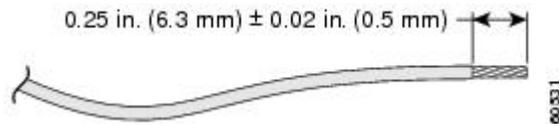
1	Line connection for high-voltage AC (PSU1)	8	Line connection for high-voltage AC (for PSU2)
2	Neutral connection for high-voltage AC (PSU1)	9	Neutral connection for high-voltage AC (PSU2)
3	Positive connection for high-voltage DC (PSU1)	10	Positive connection for high-voltage DC (PSU2)
4	Negative connection for high-voltage DC (PSU1)	11	Negative connection for high-voltage DC (PSU2)
5	PSU1 (power-supply module 1)	12	PSU2 (power-supply module 2)
6	Positive connection for low-voltage DC (PSU1)	13	Positive connection for low-voltage DC (PSU2)
7	Negative connection for low-voltage DC (PSU1)	14	Negative connection for low-voltage DC (PSU2)

Note The power-supply module 1 connection is labeled PSU1, and the power-supply module 2 connection is labeled PSU2. Make sure that you connect the wires to the correct terminal screws.

Step 3 Use twisted-pair copper wire (12- to 18-AWG) to connect from the power-input terminal to the power source.

Step 4 Strip each of the two wires to 0.25 inch (6.3 mm) ± 0.02 inch (0.5 mm).

Note Do not strip more than 0.27 inch (6.8 mm) of insulation from the wire. Stripping more than the recommended amount of wire can leave exposed wire from the connector after installation.

Figure 29: Stripping the Input Power Source Wire

Step 5 Insert the wire into a spade terminal, and crimp it to the wire.

You can also use a ring or flanged spade terminal. See [Equipment That You Need, on page 40](#).

Figure 30: Crimping the Spade Terminal Lug

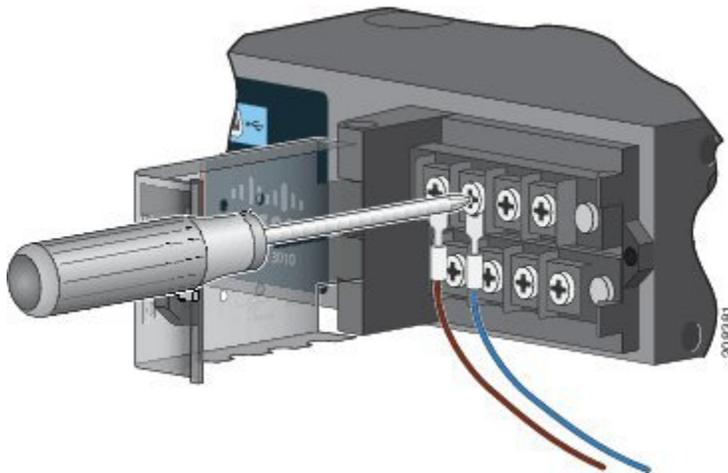
Step 6 Loosen the terminal screw, and slide the terminal under the screw and washer.

Note Use the appropriate terminal screws based on power supply type: high-voltage (AC or DC) or low-voltage (DC).

Step 7 Make the power connection:

a) AC Power Connection

Connect the line wire into the terminal screw labeled *L* and the neutral wire into the terminal screw labeled *N* to complete the AC connection.

Figure 31: Connecting the Wires to the High-Voltage AC Power (PSU1)

b) DC Power Connection

Connect the positive wire into the terminal screw labeled “+”, and the negative wire into the terminal screw labeled “-”.

c) Low-voltage DC Power-Supply Module

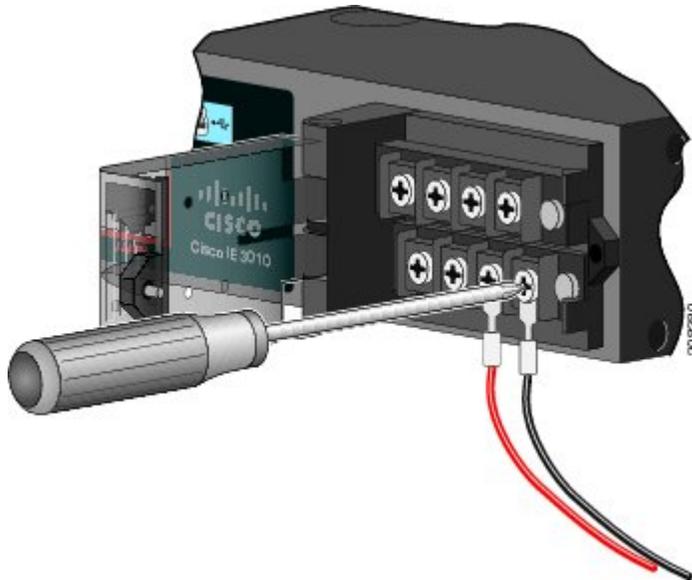
Connect the wires to the terminals labeled *Lo*.

d) High-voltage DC Power-Supply Module

Connect the wires to the terminals labeled *Hi*.

Note Ensure that you cannot see any wire lead. Only wire with insulation should extend from the terminal screw.

Figure 32: Connecting the Wires to the Low-Voltage DC Power (PSU2)



Step 8 Torque the captive screws (above the wires) to 8.5 in-lb (± 0.5 in-lb).

Step 9 Complete the power connection:

a) AC Power Connection

Connect the other end of the line wire (the one connected to *L*) to the line terminal on the AC-power source, and connect the other end of the neutral wire (the one connected to *N*) to the neutral terminal on the AC power source.

b) DC Power Connection

Connect the other end of the positive wire (the one connected to “+”) to the positive terminal on the DC-power source, and connect the other end of the negative wire (the one connected to “-”) to the negative terminal on the DC power source.

Note Ensure that you cannot see any wire lead. Only wire with insulation should extend from the terminal screw.

If you have two power supplies, repeat steps 1 through 10.

Step 10 Close the power-input terminal cover.

Step 11 Use a ratcheting torque screwdriver to torque the screw to 7 in-lb (± 1 in-lb).

Step 12 Turn on the power at the AC or DC circuit.

Step 13 Verify that the PSU1 or PSU2 LED on the switch and PSU OK LED on the power-supply module are green.

See the switch software guide for information on how to configure the power supply settings.

Removing the Power-Supply Module

The power-supply modules are hot-swappable. By removing the power-supply modules, you can power off the switch without disconnecting the wiring from the power-input terminal.

Step 1 Ensure that the power is off at the AC or DC circuits.

Locate the circuit breakers, turn them OFF, and lock out the circuit.

Warning If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

Step 2 Verify that the PSU LED and PSU OK LED is blinking red or is off.

Step 3 Use a Phillips screwdriver to loosen the captive screws that secure the power-supply module to the switch. See the following figure.

Note Hot surface. Statement 1079

Figure 33: Removing the Screws

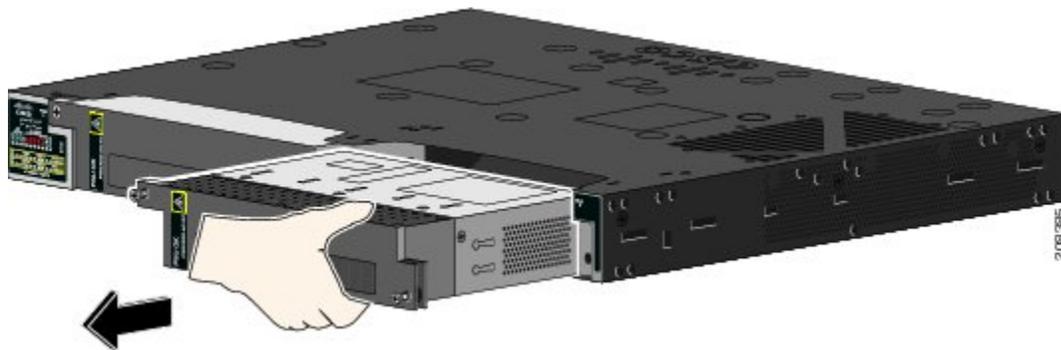


Step 4 Remove the power-supply module from the power slot. The power-supply module might be hot. See the following figure.

Step 5 Install a new power-supply module or a blank cover.

Caution To prevent exposure to hazardous voltages and to contain electromagnetic interference (EMI), either a power-supply module or a blank cover must be in each power-supply module slot at all times.

Figure 34: Removing the Power-Supply Module





CHAPTER 4

Troubleshooting

This chapter contains the following sections:

- [Diagnosing Problems, on page 49](#)
- [Resetting the Switch, on page 52](#)
- [How to Recover Passwords, on page 53](#)
- [Finding the Switch Serial Number, on page 53](#)

Diagnosing Problems

The switch LEDs provide troubleshooting information about the switch. They show boot errors, port-connectivity problems, and overall switch performance. You can also get statistics from Device Manager, the CLI, or an SNMP workstation.

Switch Boot Fast



Note Contact your Cisco TAC representative if your switch does not successfully boot.



Note You can disable boot fast and run POST by using the Cisco IOS CLI.

Switch LEDs

Look at the port LEDs information when troubleshooting the switch. See [Switch Panel LEDs, on page 6](#) for a description of the LED colors and their meanings.

Switch Connections

This section contains the following:

Bad or Damaged Cable

Always examine the cable for marginal damage or failure. A cable might be just good enough to connect at the physical layer, but it could corrupt packets as a result of subtle damage to the wiring or connectors. You can identify this problem because the port has many packet errors or it constantly flaps (loses and regains link).

- Exchange the copper or fiber-optic cable with a known good cable.
- Look for broken or missing pins on cable connectors.
- Rule out any bad patch panel connections or media converters between the source and the destination. If possible, bypass the patch panel, or eliminate media converters (fiber-optic-to-copper).
- Try the cable in another port to see if the problem follows the cable.

Ethernet and Fiber-Optic Cables

Make sure that you have the correct cable:

- For Ethernet, use Category 3 or better copper cable for 10 Mb/s UTP connections. Use either Category 5, Category 5e, or Category 6 UTP for 10/100/1000 Mb/s, and PoE connections.
- Verify that you have the correct fiber-optic cable for the distance and port type. Make sure that the connected device ports match and use the same type encoding, optical frequency, and fiber type.
- Determine if a copper crossover cable was used when a straight-through was required or the reverse. Enable auto-MDIX on the switch, or replace the cable

Link Status

Verify that both sides have a link. A broken wire or a shutdown port can cause one side to show a link even though the other side does not have a link.

A port LED that is on does not guarantee that the cable is functional. It might have encountered physical stress, causing it to function at a marginal level. If the port LED does not turn on:

- Connect the cable from the switch to a known good device.
- Make sure that both ends of the cable are connected to the correct ports.
- Verify that both devices have power.
- Verify that you are using the correct cable type. See [Cable and Connectors, on page 61](#) for information.
- Look for loose connections. Sometimes a cable appears to be seated but is not. Disconnect the cable, and then reconnect it.

10/100/1000 Port Connections

If a port appears to malfunction:

- Verify the status of all ports by checking the LEDs. For more information, see [Switch Panel LEDs, on page 6](#).
- Use the **show interfaces** command to see if the port is error-disabled, disabled, or shut down. Reenable the port if necessary.

- Verify the cable type. See [Cable and Connectors, on page 61](#).

SFP Module

Use only Cisco SFP modules. Each Cisco module has an internal serial EEPROM that is encoded with security information. This encoding verifies that the module meets the requirements for the switch.

- Inspect the SFP module. Exchange the suspect module with a known good module.
- Verify that the module is supported on this platform. (The switch release notes on Cisco.com list the SFP modules that the switch supports.)
- Use the **show interfaces** command to see if the port or module is error-disabled, disabled, or shutdown. Reenable the port if needed.
- Make sure that all fiber-optic connections are clean and securely connected.

Interface Settings

Verify that the interface is not disabled or powered off. If an interface is manually shut down on either side of the link, it does not come up until you reenables the interface. Use the **show interfaces** command to see if the interface is error-disabled, disabled, or shut down on either side of the connection. If needed, reenables the interface

Ping End Device

Ping from the directly connected switch first, and then work your way back port by port, interface by interface, trunk by trunk, until you find the source of the connectivity issue. Make sure that each switch can identify the end device MAC address in its Content-Addressable Memory (CAM) table.

Spanning Tree Loops

STP loops can cause serious performance issues that look like port or interface problems.

A unidirectional link can cause loops. It occurs when the traffic sent by the switch is received by the neighbor, but the traffic from the neighbor is not received by the switch. A broken cable, other cabling problems, or a port issue can cause this one-way communication.

You can enable UniDirectional Link Detection (UDLD) on the switch to help identify unidirectional link problems. For information about enabling UDLD on the switch, see the “Understanding UDLD” section in the switch software configuration guide on Cisco.com.

Switch Performance

This section contains the following:

Speed, Duplex, and Autonegotiation

Port statistics that show a large number of alignment errors, frame check sequence (FCS), or late-collisions errors, might mean a speed or duplex mismatch.

A common issue occurs when duplex and speed settings are mismatched between two switches, between a switch and a router, or between the switch and a workstation or server. Mismatches can happen when manually setting the speed and duplex or from autonegotiation issues between the two devices.

To maximize switch performance and to ensure a link, follow one of these guidelines when changing the duplex or the speed settings.

- Let both ports autonegotiate both speed and duplex.
- Manually set the speed and duplex parameters for the interfaces on both ends of the connection.
- If a remote device does not autonegotiate, use the same duplex settings on the two ports. The speed parameter adjusts itself even if the connected port does not autonegotiate.

Autonegotiation and Network Interface Cards

Problems sometimes occur between the switch and third-party network interface cards (NICs). By default, the switch ports and interfaces autonegotiate. Laptops or other devices are commonly set to autonegotiate, yet sometimes issues occur.

To troubleshoot autonegotiation problems, try manually setting both sides of the connection. If this does not solve the problem, there could be a problem with the firmware or software on the NIC. You can resolve this by upgrading the NIC driver to the latest version.

Cabling Distance

If the port statistics show excessive FCS, late-collision, or alignment errors, verify that the cable distance from the switch to the connected device meets the recommended guidelines. See the [Cable and Connectors, on page 61](#).

Resetting the Switch

These are reasons why you might want to reset the switch to the factory default settings:

- You installed the switch in your network and cannot connect to it because you assigned the wrong IP address.
- You want to reset the password on the switch.



Note Resetting the switch deletes the configuration and reboots the switch.



Caution If you press the Express Setup button when you power on, the automatic boot sequence stops, and the switch enters bootloader mode.

To reset the switch:

1. Press and hold the Express Setup button (recessed behind a small hole in the faceplate) for at least 15 seconds with a paper clip or similar object. The switch reboots. The system LED turns green after the switch completes rebooting.
2. Press the Express Setup button again for 3 seconds. A switch 10/100/1000 Ethernet port blinks green.

The switch now behaves like an unconfigured switch. You can configure the switch by using the CLI setup procedure described in [Configuring the Switch with the CLI Setup Program, on page 65](#).

How to Recover Passwords

Password recovery is a feature that a system administrator can enable or disable. If password recovery is disabled, the only way to recover from a lost or forgotten password is to clear the switch configuration entirely. For this procedure, see [How to Recover Passwords, on page 53](#).

The Cisco IE 4010 Switch Software Configuration Guide provides details about enabling and disabling the password recovery feature and the procedure for recovering passwords.

Finding the Switch Serial Number

If you contact Cisco Technical Assistance, you need to know the serial number of your switch. The serial number is on the top of the switch. You can also use the **show version** command to obtain the switch serial number.



CHAPTER 5

Hazardous Location Installation Information

This chapter contains the following sections:

- [Hazardous Area Installation Warnings, on page 55](#)
- [North American Hazardous Location Approval, on page 57](#)
- [EMC Environmental Conditions for Products Installed in the European Union, on page 58](#)
- [Hazardous Locations Standards, on page 58](#)

Hazardous Area Installation Warnings



Caution When installed in a Class I. Div/Zone 2 hazardous location environment, this equipment must be installed in a min. IP54, ATEX certified enclosure.



Caution Airflow around the switch must be unrestricted. To prevent the switch from overheating, there must be the following minimum clearances:

- Top and bottom: 2.0 in. (50.8 mm)
 - Sides: 2.0 in. (50.8 mm)
 - Front: 2.0 in. (50.8 mm)
-

Contact your Cisco Technical Assistance Centre (TAC) if tighter spacings are required.



Caution When installed in a Class I. Div/Zone 2 hazardous location environment. this equipment must be installed in a pollution degree 2 environment per IEC 60664-1)



Caution This equipment is suitable for use in Class I. Division 2. Groups A, B. C. D. or only nonhazardous locations.



Caution Do not install or remove SFP modules when an explosive atmosphere may be present.



Caution Do not install or remove power supplies when an explosive atmosphere may be present.



Caution Do not use the USB Console Service Port when an explosive atmosphere may be present.



Warning Exposure to some chemicals could degrade the sealing properties of materials used in the sealed relay device. Statement 381



Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017



Warning To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of : 140°F (60°C) Statement 1047



Warning When you connect or disconnect the power and/or alarm connector with power applied, an electrical arc can occur. This could cause an explosion in hazardous area installations. Be sure that all power is removed from the switch and any other circuits. Be sure that power cannot be accidentally turned on or verify that the area is nonhazardous before proceeding. Statement 1058



Warning In switch installations in a hazardous location, the DC power source could be located away from the vicinity of the switch. Before performing any of the following procedures, locate the DC circuit to ensure that the power is removed and cannot be turned on accidentally, or verify that the area is nonhazardous before proceeding. Statement 1059



Warning This equipment is supplied as “open type” equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. The enclosure must meet IP 54 or NEMA type 4 minimum enclosure rating standards. Statement 1063



Warning Use twisted-pair supply wires suitable for 86°F (30°C) above surrounding ambient temperature outside the enclosure. Statement 1067



Warning When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with a proper wiring method that complies with the governing electrical codes. Statement 1069



Warning Explosion Hazard—The area must be known to be nonhazardous before installing, servicing, or replacing the unit. Statement 1082



Note This equipment has been tested by UL for the explosion, fire, shock and casualty hazards required by the applicable hazardous locations standards. UL certification does not cover the performance or reliability of any GPS hardware, GPS operating software, or other GPS-related aspects of equipment covered under this category. Accordingly, UL makes no representations, warranties or certifications regarding the performance or reliability of any GPS-related functions of equipment covered under this category.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:

English:	Products marked "Class I, Div 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.
Français:	Informations sur l'utilisation de cet équipement en environnements dangereux: Les produits marqués "Class I, Div 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

EMC Environmental Conditions for Products Installed in the European Union

This section applies to products to be installed in the European Union.

The equipment is intended to operate under the following environmental conditions with respect to EMC:

- A separate defined location under the user's control.
- Earthing and bonding shall meet the requirements of ETS 300 253 or CCITT K27.
- AC-power distribution shall be one of the following types, where applicable: TN-S and TN-C as defined in IEC 364-3.

In addition, if equipment is operated in a domestic environment, interference could occur.

Hazardous Locations Standards

The following standards were used for the hazardous locations approvals and certifications:	Les normes suivantes ont été appliquées pour les approbations et les certifications dans le cadre d'environnements dangereux :
ANSI/ASA 12.12.01-2013	ANSI/ASA 12.12.01-2013
CAN/CSA C22.2 No. 60079-0-11 Ed. 2	CAN/CSA C22.2 n° 60079-0-11 Éd. 2
CAN/CSA C22.2 No. 60079-15-12 Ed. 1	CAN/CSA C22.2 n° 60079-15-12 Éd. 1
CSA C22.2 No. 213-M1987	CSA C22.2 n° 213-M1987
EN 60079-0:2012+A11:2013	EN 60079-0:2012+A11:2013
EN 60079-15:2010	EN 60079-15:2010
IEC 60079-0 6th Edition	IEC 60079-0, 6e édition
IEC 60079-15 4th Edition	IEC 60079-15, 4e édition
UL 60079-0, 5th Ed, 2009-10-21	UL 60079-0, 5e éd., 21-10-2009
UL 60079-15, 3rd Ed, 2009-7-17	UL 60079-15, 3e éd., 17-07-2009
The following hazardous locations strings are provided on the access point:	Les marques d'homologation relatives aux environnements dangereux suivantes sont apposées sur le point d'accès :
Class 1, Div 2, Groups A B C D	Classe 1, Div 2, Groupes A B C D
Class 1, Zone 2, Ex nA nC IIC T4 Gc X	Classe 1, Zone 2, Ex nA nC IIC T4 Gc X
II 3 G, Ex nA nC IIC T4 Gc	II 3 G, Ex nA nC IIC T4 Gc

The following standards were used for the hazardous locations approvals and certifications:	Les normes suivantes ont été appliquées pour les approbations et les certifications dans le cadre d'environnements dangereux :
DEMKO 14 ATEX 1435X	DEMKO 14 ATEX 1435X
Class 1, Zone 2, AEx nA nC IIC T4 Gc	Classe 1, Zone 2, AEx nA nC IIC T4 Gc



CHAPTER 6

Cable and Connectors

This chapter contains the following sections:

- [Connector Specifications, on page 61](#)
- [Cables and Adapters, on page 63](#)

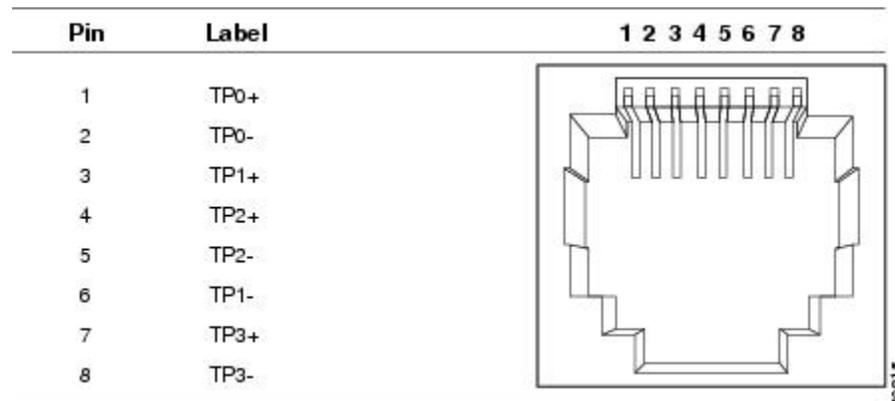
Connector Specifications

This section contains the following:

10/100/1000 Ports

The 10/100/1000 Ethernet ports on the switches use RJ-45 connectors. The following figure shows the pinouts.

Figure 35: 10/100/1000 Port Pinouts

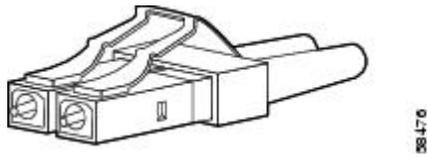


Connector pins 1, 2, 3, and 6 are used for PoE.

SFP Module Connectors

The following figure shows a LC style connector that is used with the SFP Module slots. It is a fiber-optic cable connector.

Figure 36: Fiber-Optic SFP Module LC Connector

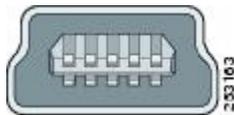


Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

Console Port

The switch has two console ports: a USB 5-pin mini-Type B port (see the following figure) and an RJ-45 (RS-232) console port.

Figure 37: USB Mini-Type B Port

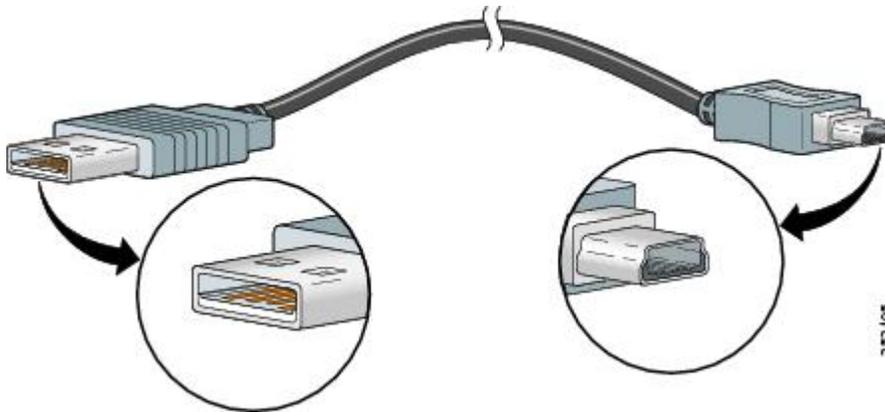


The USB console port uses a USB Type A to 5-pin mini-Type B cable. The USB Type A-to-USB mini-Type B cable is not supplied. You can order an accessory kit that contains this cable.



Note When running Linux, access the USB Console using **Minicom** instead of **Screen**.

Figure 38: USB Type A-to-USB 5-Pin Mini-Type B Cable



The RJ-45 console port uses an 8-pin RJ-45 connector. An RJ-45-to-DB-9 adapter cable is used to connect the console port of the switch to a console PC. You need to provide a RJ-45-to-DB-25 female DTE adapter if you want to connect the switch console port to a terminal. You can order a kit (part number ACS-DSBUASYN=) containing that adapter. For console port and adapter pinout information, see [Console Ports, on page 5](#).

Alarm Port

The alarm port uses an RJ-45 connector. See [100/1000 SFP Ports, on page 5](#) for more information. For information on alarm ratings, see [Alarm Ratings, on page 79](#).

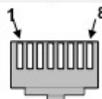
Figure 39: Alarm Port Details

IE4010 Alarm Pinout

IE4010 supports:

- Four External Alarm Inputs
- One form C output

Alarm Connection	RJ-45 Pin
Alarm 1 input	1
Alarm 2 input	2
Alarm Output N/C	3
Alarm 3 input	4
Alarm 4 input	5
Alarm Output N/O	6
Alarm Output Common	7
Alarm Input Common	8



RJ-45 Alarm Connector on IE-4010 Chassis

Alarm Input Details

Normally Open (NO) Contacts
"closed" triggers alarm



Normally Closed (NC) Contacts
"open" triggers trigger



Alarm Output Details

Form-C Normally Open/Normally Closed Contacts
"No Alarm" State Shown



Cables and Adapters

This section contains the following:

SFP Module Cables

Each port must match the wave-length specifications on each end of the cable, and for reliable communications, the cable must not exceed the allowable length.

For more information about SFP/SFP+ modules and cables, see [Transceiver Modules](#).

Console Port Adapter Pinouts

The console port uses an 8-pin RJ-45 connector. If you did not order a console cable, you need to provide an RJ-45-to-DB-9 adapter cable to connect the switch console port to a PC console port. You need to provide an RJ-45-to-DB-25 female DTE adapter if you want to connect the switch console port to a terminal. You can order an adapter (part number ACS-DSBUASYN=).

The following tables list the pinouts for the console port, the RJ-45-to-DB-9 adapter cable, and the console device.

Table 12: Console Port Adapter Pinouts (RJ-45-to-DB-9)

Switch Console Port (DTE)	RJ-45-to- DB-9 Terminal Adapter	Console Device
Signal	DB-9 Pin	Signal
RTS	8	CTS
DTR	6	DSR
TxD	2	RxD
GND	5	GND
RxD	3	TxD
DSR	4	DTR
CTS	7	RTS



Note The RJ-45-to-DB-25 female DTE adapter is not supplied with the switch. You can order this adapter from Cisco (part number ACS-DSBUASYN=).

Table 13: Console Port Adapter Pinouts (RJ-45-to-DB-25)

Switch Console Port (DTE)	RJ-45-to- DB-25 Terminal Adapter	Console Device
Signal	DB-25 Pin	Signal
RTS	5	CTS
DTR	6	DSR
TxD	3	RxD
GND	7	GND
RxD	2	TxD
DSR	20	DTR
CTS	4	RTS



CHAPTER 7

Configuring the Switch with the CLI Setup Program

This appendix provides a command-line interface (CLI) setup procedure for a standalone switch. Before connecting the switch to a power source, review the safety warnings in Warnings and Installation Guidelines.

This chapter contains the following sections.

- [Accessing the CLI Through Express Setup, on page 65](#)
- [Accessing the CLI Through the Console Port, on page 70](#)
- [Entering the Initial Configuration Information, on page 73](#)

Accessing the CLI Through Express Setup

When you first set up the switch, you should use Express Setup to enter the initial IP information. This process enables the switch to connect to local routers and the Internet. You can then access the switch through the IP address for additional configuration.

Required Equipment

You need this equipment to set up the switch:

- Computer with Windows 2000/Vista/2003/XP/Window7/Mac.
- A Web browser (IE, Firefox) with JavaScript enabled.
- A straight-through or crossover Category 5 Ethernet cable to connect your computer to the switch port.



Note Do not use the RS232 serial console port for express setup.

- A small paper clip to reach to button.



Note Before running Express Setup, disable any pop-up blockers or proxy settings on your browser and any wireless client running on your computer.

Express Setup Procedure

To run Express Setup:

Step 1 Make sure that nothing is connected to the switch.

Step 2 Ensure the switch is in default factory mode.

Skip to next step if freshly out of the box

If not freshly out of the package, use a paper clip to reset the switch for at least 15 seconds until the SYS LED light turns red; then release the paper clip.

Switch will automatically reboot once the SYS led goes red.

Step 3 Ensure no data port is connected to the switch.

Note During Express Setup, the switch acts as a DHCP server.

- You can add a serial console cable to monitor the booting sequence. *Do not hit [return key] on console screen.*
- Ensure the computer connected to switch is configured with DHCP.

Step 4 Web Browser: disable pop-up blockers and proxy settings.

Step 5 Connect power to the switch.

See the wiring instructions in [Grounding the Switch, on page 40](#) and [Wiring the Power Source, on page 44](#).

Step 6 Power on or reset the switch.

Use LEDs to monitor boot progress:

- Sys blinking: bootloader
- Sys Blank: POST
- Sys solid: exit post, IOS initializing
- Sys and alarm LEDs green: IOS init done
- ~90 – 100 seconds after power on

Step 7 Insert paper clip into express setup button for 1-2 seconds.

When released, port Gig1/1 LED starts flashing green.

Step 8 Connect computer to port Gig1/1.

LED continues to blink.

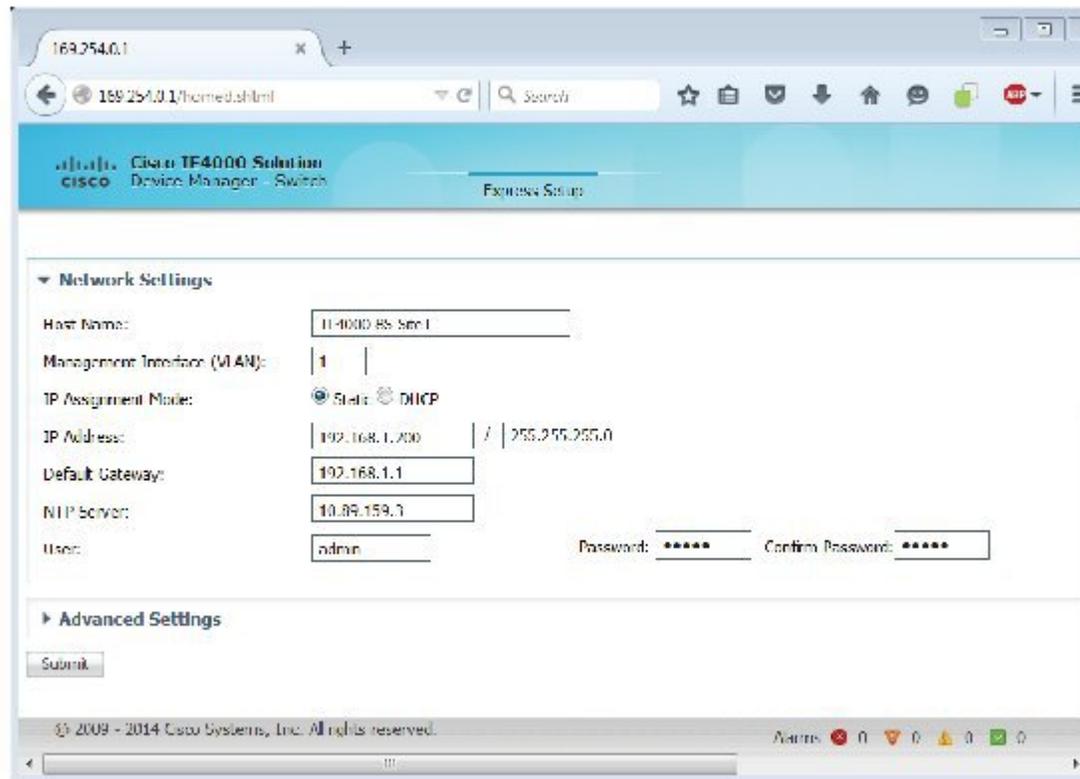
Step 9 After computer has IP address (192.168.1.1), point browser to <http://192.168.1.254>.

Step 10 Leave the **username** blank and enter the default password, **cisco**.

Note The switch ignores text in the **username** field. The Express Setup window appears.

Troubleshooting: If the Express Setup window does not appear, make sure that any pop-up blockers or proxy settings on your browser are disabled and that any wireless client is disabled on your computer.

Note The screen capture below shows an IE 4000 series switch, but the functionality is identical for the IE 4010.



Step 11 Enter all entries in English letters and Arabic numbers.

In the Network Settings (Required for Static IP):

- **IP Address:** Enter a valid IP address for the switch.

You can later use the IP address to access the switch through Device Manager.

- **Switch Username and Password :** Enter a password. The password can be from 1 to 25 alphanumeric characters, can start with a number, is case sensitive, allows embedded spaces, but does not allow spaces at the beginning or end. In the Confirm Password field, enter the password again.

Note You must change the password from the default password, cisco.

- **Default Gateway:** Enter the IP address of the router.

Step 12 Enter the Control Industrial Protocol (CIP) VLAN settings (optional):

- **CIP VLAN:** Enter the VLAN on which CIP will be enabled. The CIP VLAN can be the same as the management VLAN, or you can isolate CIP traffic on another VLAN that is already configured on the switch. The default CIP VLAN is VLAN 1. Only one VLAN on a switch can have CIP enabled.
- **IP Address:** Enter the IP address for the CIP VLAN. If the CIP VLAN is different from the management VLAN, you must specify an IP address for the CIP VLAN. Make sure that the IP address that you assign to the switch is not being used by another device in your network.
- **Subnet Mask:** Select a mask from the drop-down list.

For more information about the CIP VLAN settings, click **Help** on the tool-bar.

Step 13 Optional Settings:

You can enter the optional information now, or enter it later by using Device Manager. For more information about the Express Setup fields, see the on-line help for the Express Setup window.

Click **Submit** to save your changes and to complete the initial setup.

For more information about the optional settings, click **Help** on the tool-bar.

After you click **Submit**, these events occur:

- The switch is configured and exits Express Setup mode.
- The browser displays a warning message and tries to connect with the earlier switch IP address.
- Typically, connectivity between the computer and the switch is lost because the configured switch IP address is in a different subnet from the IP address on the computer.

Step 14 Turn off DC power at the source, disconnect all cables to the switch, and install the switch in your network. See [Management Options, on page 13](#) for information about configuring and managing the switch.

Step 15 If you changed the static IP address on your computer in Step 1, change it to the previously configured static IP address.

Note The screen capture below shows an IE 4000 series switch, but the functionality is identical for the IE 4010.



Step 16 You can now manage the switch by using the Device Manager. See [Management Options, on page 13](#) for information about configuring and managing the switch.

You can display Device Manager by following these steps:

- a) Start a web browser on your computer.
- b) Enter the switch **IP address**, **username**, and **password** in the web browser, and press Enter. The Device Manager page appears.

Troubleshooting:

If the Device Manager page does not appear:

- Confirm that the port LED for the switch port connected to your network is green.
- Confirm that the computer that you are using to access the switch has network connectivity by connecting it to a well known web server in your network. If there is no network connection, troubleshoot the network settings on the computer.
- Make sure that the switch IP address in the browser is correct.
- If the switch IP address in the browser is correct, the switch port LED is green, and the computer has network connectivity, continue troubleshooting by reconnecting the computer to the switch. Configure a static IP address on the computer that is in the same subnet as the switch IP address.

When the LED on the switch port connected to the computer is green, reenter the switch IP address in a web browser to display the Device Manager. When Device Manager appears, you can continue with the switch configuration.

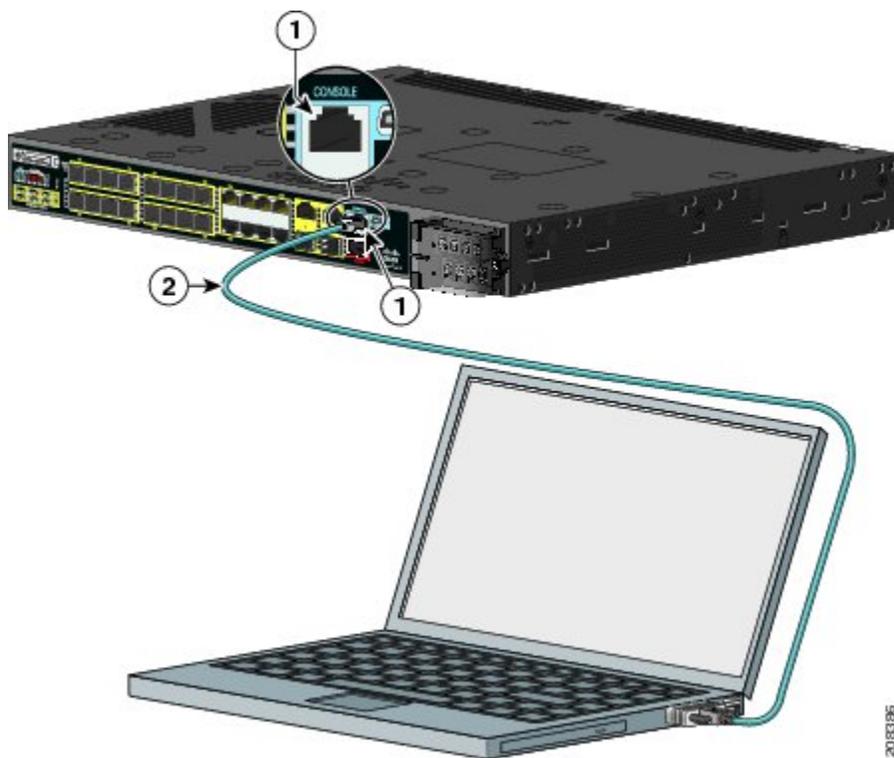
Accessing the CLI Through the Console Port

You can enter Cisco IOS commands and parameters through the CLI. Use one of these options to access the CLI:

RJ-45 Console Port

- Step 1** Connect the RJ-45-to-DB-9 adapter cable to the 9-pin serial port on the PC. Connect the other end of the cable to the switch console port.
- Step 2** Start the terminal-emulation program on the PC or the terminal. The program, frequently a PC application such as HyperTerminal or ProcommPlus, makes communication between the switch and your PC or terminal possible.

Figure 40: Connecting the Console Cable



1	RJ-45 console port
2	Console cable (RJ-45-to-DB-9 adapter cable)

- Step 3** Configure the baud rate and character format of the PC or terminal to match the console port characteristics:
 - 9600 baud
 - 8 data bits
 - 1 stop bit

- No parity
- None (flow control)

Step 4 Connect power to the switch as described in [Wiring the Power Source, on page 44](#).

Step 5 The PC or terminal displays the bootloader sequence. Press Enter to display the setup prompt. Follow the steps in [Completing the Setup Program, on page 74](#).

USB Console Port

Step 1 If you are connecting the switch USB console port to a Windows-based PC for the first time, install a USB driver. See [Installing the Cisco Microsoft Windows XP, 2000, Vista, 7, 8, and 10 USB Device Driver](#) for more information.

Figure 41: Connecting the USB Console Cable

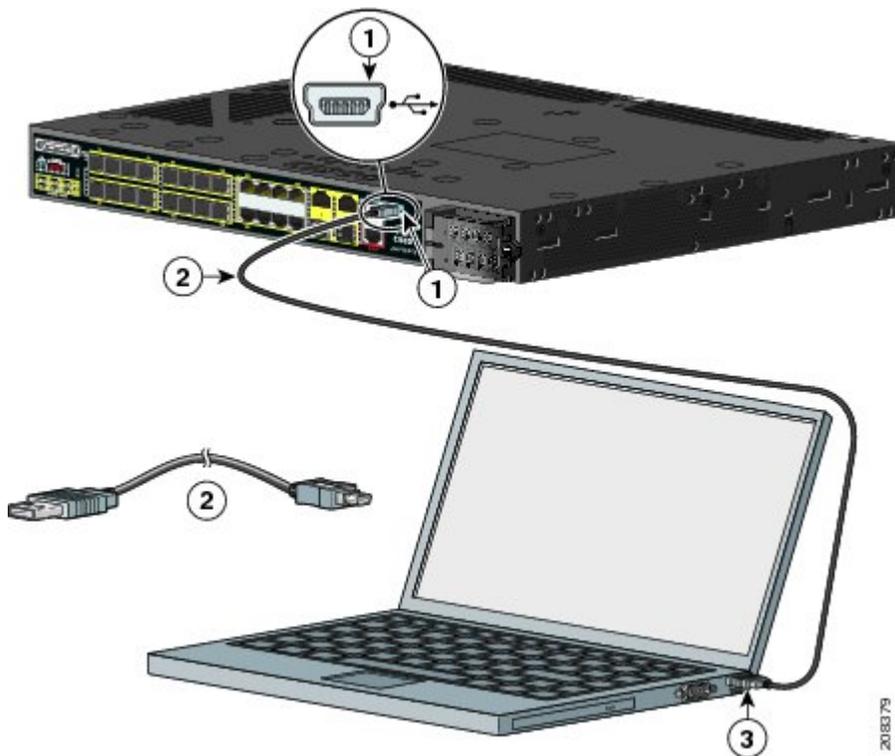


Table 14:

1	USB console port
2	USB cable
3	USB port on the PC

- Step 2** Connect an USB cable to the PC USB port, and connect the other end of the cable to the switch mini-B (5-pin-connector) USB console port.
- Step 3** To identify the COM port assigned to the USB console port:
- Choose Start > Control Panel > Systems
 - Click the **Hardware** tab and choose **Device Manager**.
 - Expand the **Ports** section.
- The assigned COM port appears in parenthesis at the end of the line with this entry: Cisco USB System Management Console.
- Step 4** Start the terminal-emulation program on the PC or the terminal.
- The program, frequently a PC application such as HyperTerminal or ProcommPlus, makes communication possible between the switch and your PC or terminal.
- Step 5** Configure the COM port.
- Step 6** Configure the baud rate and character format of the PC or terminal to match the console port characteristics:
- 9600 baud
 - 8 data bits
 - 1 stop bit
 - No parity
 - None (flow control)
- Step 7** Connect power to the switch as described in [Wiring the Power Source, on page 44](#).
- The PC or terminal displays the bootloader sequence.
- Step 8** Press Enter to display the setup prompt.
- Step 9** Follow the steps in [Completing the Setup Program, on page 74](#).

Installing the Cisco Microsoft Windows XP, 2000, Vista, 7, 8, and 10 USB Device Driver

A USB device driver must be installed the first time a Microsoft Windows-based PC is connected to the USB console port on the switch. Use this procedure to install the USB driver on Windows XP, Windows 2000, Windows Vista, Windows 7, Windows 8, and Windows 10.

1. Obtain the file `Cisco_usbconsole_driver_3_1.zip` from the Cisco.com website

<https://software.cisco.com/download/release.html?mdfid=282979369&softwareid=282855122&release=3.1>

The file details are as follows:

- Description: `Cisco_usbconsole_driver_3_1.zip`
- Release: 3.1
- Release Date: 27/Nov/2014

- File Name: Cisco_usbconsole_driver_3_1.zip
- Size: 14.35 MB (15045453 bytes)
- MD5 Checksum: eff2e955edcdc70209e6f9c8f6bd59cd

2. Unzip the file and install the corresponding exe file.
3. Navigate to the Device Manager window by performing a search in Windows for Device Manager and opening it.
4. Connect the USB cable from the Windows PC to the Cisco switch.
5. From the Device Manager page, expand Ports (COM & LPT). Select USB Serial Port. Right-click and select Update Driver Software
6. In the Update Driver Software window, select Browse my computer for driver software. Then choose Let me pick from a list of device drivers on my computer and click Next.
7. Enable Show compatible hardware and choose Cisco Serial as the model. Click Next.
After the update is completed, Windows displays Windows has successfully updated your driver software.
8. Click Close.

Uninstalling the Cisco Microsoft Windows XP, 2000, Vista, 7, 8, and 10 USB Driver

Note: Disconnect the switch console terminal before uninstalling the driver.

1. Run setup.exe for Windows 32-bit or setup(x64).exe for Windows-64bit.
2. Click Next.
3. When the InstallShield Wizard for Cisco Virtual Com appears, click Next.
4. When the Program Maintenance window appears, select the Remove radio button.
5. Click Next.
6. When the Remove the Program window appears, click Remove.
If a User Account Control warning appears, click Allow - I trust this program to proceed.
7. When the InstallShield Wizard Completed window appears, click Finish.

Entering the Initial Configuration Information

To set up the switch, you need to complete the setup program, which runs automatically after the switch powers on. You must assign an IP address and other configuration information necessary for the switch to communicate with the local routers and the Internet.

IP Settings

You need this information:

- Switch IP address
- Subnet mask (IP netmask)
- Default gateway (router)
- Enable secret password
- Enable password
- Telnet password

Completing the Setup Program

Follow these steps to complete the setup program and to create an initial configuration for the switch:

Step 1 Enter Yes at these two prompts.

```
Would you like to enter the initial configuration dialog? [yes/no]: yes
```

```
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
```

```
Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system.
```

```
Would you like to enter basic management setup? [yes/no]: yes
```

Step 2 Enter a host name for the switch, and press Return.

On a command switch, the host name is limited to 28 characters and on a member switch to 31 characters. Do not use *-n*, where *n* is a number, as the last character in a host name for any switch.

```
Enter host name [Switch]: host_name
```

Step 3 Enter an enable secret password, and press Return.

The password can be from 1 to 25 alphanumeric characters, can start with a number, is case sensitive, allows spaces, but ignores leading spaces. The secret password is encrypted, and the enable password is in plain text.

```
Enter enable secret: secret_password
```

Step 4 Enter an enable password, and press Return.

```
Enter enable password: enable_password
```

Step 5 Enter a virtual terminal (Telnet) password, and press Return.

The password can be from 1 to 25 alphanumeric characters, is case sensitive, allows spaces, but ignores leading spaces.

```
Enter virtual terminal password: terminal-password
```

Step 6 (Optional) Configure Simple Network Management Protocol (SNMP) by responding to the prompts. You can also configure SNMP later through the CLI. To configure SNMP later, enter **no**.

```
Configure SNMP Network Management? [no]: no
```

Step 7 Enter the interface name (physical interface or VLAN name) of the interface that connects to the management network, and press Return. For this release, always use `vlan1` as that interface.

```
Enter interface name used to connect to the
management network from the above interface summary: vlan1
```

Step 8 Configure the interface by entering the switch IP address and subnet mask and pressing Return. The IP address and subnet masks shown below are examples.

```
Configuring interface vlan1:
Configure IP on this interface? [yes]: yes
IP address for this interface: 10.4.120.106
Subnet mask for this interface [255.0.0.0]: 255.0.0.0
```

Step 9 Enter **Y** to configure the switch as the cluster command switch. Enter **N** to configure it as a member switch or as a standalone switch.

If you enter **N**, you can configure the switch as a command switch later through the CLI. To configure it later, enter **no**.

```
Would you like to enable as a cluster command switch? [yes/no]: no
```

You have completed the initial configuration of the switch, and the switch displays its configuration. This is an example of the configuration output:

The following configuration command script was created:

```
hostname switch1
enable secret 5 $1$U1q8$D1A/OiaEbl90WcBPd9cOn1
enable password enable_password
line vty 0 15
password terminal-password
no snmp-server
!
no ip routing

!
interface Vlan1
no shutdown
ip address 10.4.120.106 255.0.0.0
!
interface FastEthernet1/0/1
!
interface FastEthernet1/0/2

interface FastEthernet1/0/3
!
...<output abbreviated>
end
```

Step 10 These choices appear:

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.
```

If you want to save the configuration and use it the next time the switch reboots, select option 2 to save it in NVRAM.

Enter your selection [2]:**2**

Make your selection, and press **Return**.

After you complete the setup program, the switch can run the default configuration that you created. To change this configuration or to perform other management tasks, enter commands at the *Switch> prompt*.



CHAPTER 8

Technical Specifications

This chapter contains the following sections:

- [Switch Specifications, on page 77](#)
- [Power-Supply Module Specifications, on page 79](#)
- [Alarm Ratings, on page 79](#)

Switch Specifications

Table 15: Cisco IE 4010 Switch Specifications

Environmental Ranges	
Operating temperature	-40°C to +74°C
Note Operating temperatures exceeding 60°C are not covered by the product safety certifications and approvals. However, the switch can function in the installations under the environmental conditions listed.	<ul style="list-style-type: none"> • -40°C to +75°C (Vented Enclosure Operating- 40 LFM Air Flow) • -40°C to +60°C (Sealed Enclosure Operating- 0 LFM Air Flow) • -34°C to +75°C (Fan or Blower equipped Enclosure Operating- 200 LFM Air Flow) • -40°C to +85°C (IEC 60068-2-2 Environmental Type Tested to +85°C for 16 hours)
	Note The maximum operating temperature of the switch varies depending on the type of SFP module that you use.
Storage temperature	-40 to 185°F (-40 to 85°C)
Relative humidity	5 to 95% (noncondensing)
Operating altitude	Up to 13,800 ft (3049 m)
Storage altitude	Up to 15,000 ft (4570 m)
Thermal spacing	1.75 in. (4.4 cm)
Operational shock	50G at 11ms, half sine and 200G at 2.11ms, half sine.

Environmental Ranges	
Non-Operational Shock	65-80G at 9ms, Trapezoidal
Physical Specifications	
Weight	Without power supply: IE-4010-4S24P: 12.1 lbs (5.46 kg), IE-4010-16S12P: 12.7 lbs (5.78 kg) <ul style="list-style-type: none"> • PWR-RGD-AC-DC-H: 2.55 lb (1.16 kg) • PWR-RGD-LOW-DC-H: 2.5 lb (1.13 kg)
Dimensions (H x W x D)	1.75 x 17.5 x 15.0 in. (4.45 x 44.5 x 38.1 cm)

Table 16: Cisco IE 4010 Switch Power Requirements

Nominal input voltage	PWR-RGD-AC-DC-H: 100 to 240 VAC, 50 to 60 Hz 100 to 250 VDC PWR-RGD-LOW-DC-H: 24 to 60 VDC
Absolute maximum (short term) input voltage	PWR-RGD-AC-DC-H: 85 to 265 VAC, 47 to 63 Hz 88 to 300 VDC PWR-RGD-LOW-DC-H: 18 to 75 VDC
Maximum PoE power available to Powered Devices (PD), with one power supply module installed	80W
Maximum PoE power available to Powered Devices (PD), with two power supply modules installed	200W

Table 17: Table 15 Cisco IE 4010 Switch Power Consumption

		Max Power at 60C			
FRU Configuration	FRU Mode	IE-4010-4S24P		IE-4010-16S12P	
		Watts	BTU/hr	Watts	BTU/hr
With 2 power supplies (150W or 250W), PoE not enabled.	Redundant	65	222	70	239

		Max Power at 60C			
FRU Configuration	FRU Mode	IE-4010-4S24P		IE-4010-16S12P	
		Watts	BTU/hr	Watts	BTU/hr
With 1 power supply (150W or 250W), PoE not enabled.	-NA-	61	208	65	222
With 2 150W power supplies, PoE enabled	Load Shared	112	382	117	399
With 2 250W power supplies, PoE enabled	Load Shared	157	535	156	532
With 2 power supplies(150W and 250W), PoE enabled	Load Shared	133	454	138	471

Power-Supply Module Specifications

Table 18: Power Supply Module Physical Specifications

Weight PWR-RGD-AC-DC-H PWR-RGD-LOW-DC-H	2.55 lb (1.15 kg) 2.5 lb (1.13 kg)
Dimensions (H x W x D) PWR-RGD-AC-DC-H and PWR-RGD-LOW-DC-H	1.58 x 7 x 5 in. (4 x 17.8 x 12.7 cm) (without mounting flanges) 1.58 x 8.15 x 5 in. (4 x 20.7 x 12.7 cm) (with mounting flanges)

Alarm Ratings

Table 19: Alarm Input and Output Ratings

Alarm input electrical specification	No external voltage needed to activate alarm inputs. The open circuit voltage between any Alarm input (1 to 4) and Alarm input Common is 5VDC and the loop current is 2 mA max per input.
Alarm output electrical specification	30VDC @ 1A, 48VDC @ 0.5A

