



Cisco Catalyst IE3100 Rugged Series Switches Hardware Installation Guide

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CHAPTER 1

Cisco Catalyst IE3100 Rugged Series Switches

- [Cisco Catalyst IE3100 Rugged Series Switches, on page 1](#)
- [Switch Models, on page 1](#)
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Cisco Catalyst IE3100 Rugged Series Switches

Cisco Catalyst IE3100 Rugged Series Switches are the next-generation of Layer 2 Catalyst Industrial Switches in Cisco's IoT DIN rail switching portfolio. The switches are the successor to Cisco Industrial Ethernet 2000 Series Switches but feature Cisco IOS XE software.

This switch provides a rugged and secure switching infrastructure for harsh environments. It is suitable for industrial Ethernet applications, including factory automation, intelligent transportation systems (ITSs), substations, oil and gas installations, and other deployments in harsh environments.

You can connect this switch to office networking devices such as Cisco IP phones, Cisco Wireless Access Points workstations, and other devices such as servers, routers, and other switches. In industrial environments, you can connect any Ethernet-enabled industrial communication devices, including programmable logic controllers (PLCs), human-machine interfaces (HMIs), drives, sensors, video devices, traffic signal controllers, and intelligent electronic devices (IEDs).

You can mount the switch on a DIN rail in an industrial enclosure. Its components are designed to withstand extremes in temperature, vibration, and shock common to industrial environments.

Switch Models

The following table lists Cisco Catalyst IE3100 Rugged Series Switches, their default license levels, and their distinguishing features.

Switch Model	Default License Level	Links	FPGA Data Path
IE-3100-4T2S-E	Network Essentials	<ul style="list-style-type: none"> • Uplinks: 2x 1000BASE-X SFP ports • Downlinks: 4x 1000BASE-T RJ-45 ports 	No
IE-3100-8T2C-E	Network Essentials	<ul style="list-style-type: none"> • Uplinks: 2x 1000BASE-T/1000BASE-X dual-media ports • 8x 1000BASE-T RJ-45 ports 	No
IE-3100-8T4S-E	Network Essentials	<ul style="list-style-type: none"> • Uplinks: 4x 1000BASE-X SFP ports • Downlinks: 8x 1000BASE-T RJ-45 ports 	No
IE-3100-18T2C-E	Network Essentials	<ul style="list-style-type: none"> • Uplinks: 2x 1000BASE-T/1000BASE-X dual-media ports • 8x 1000BASE-T RJ-45 ports 	Yes
IE-3105-8T2C-E	Network Essentials	<ul style="list-style-type: none"> • Uplinks: 2x 1000BASE-T/1000BASE-X dual-media ports • Downlinks: 18x 1000BASE-T RJ-45 ports 	Yes
IE-3105-18T2C-E	Network Essentials	<ul style="list-style-type: none"> • Uplinks: 2x 1000BASE-T/1000BASE-X dual-media ports • Downlinks: 18x 1000BASE-T RJ45 ports 	Yes

All Cisco Catalyst IE3100 Rugged Series Switches also have the following features:

- A system LED
- An Express Setup button
- An SD-card connector
- Two alarm inputs
- One alarm output
- Dual power connectors

- A micro-USB port

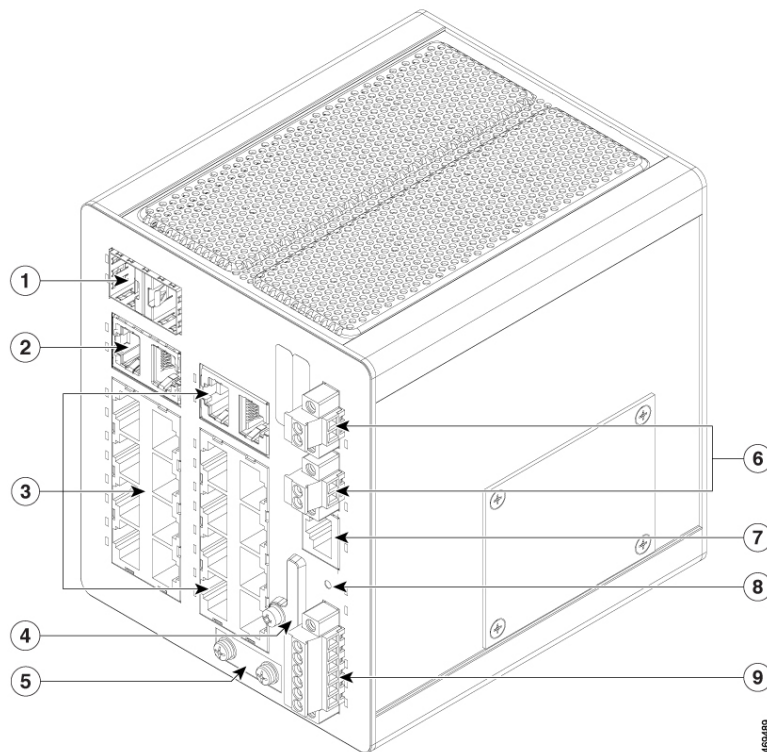
Front Panel

This section provides an overview of ports, connectors, and LEDs on front of Cisco Catalyst IE3100 Rugged Series Switches.



Note This section uses the Cisco Catalyst IE-3105-18T2C-E as an example. Other switches in the series may not have all the same features. See [Cisco Catalyst IE3100 Rugged Series Switches, on page 1](#) in this guide for details of each switch model's features.

Figure 1: IE-3105-18T2C-E Front Panel

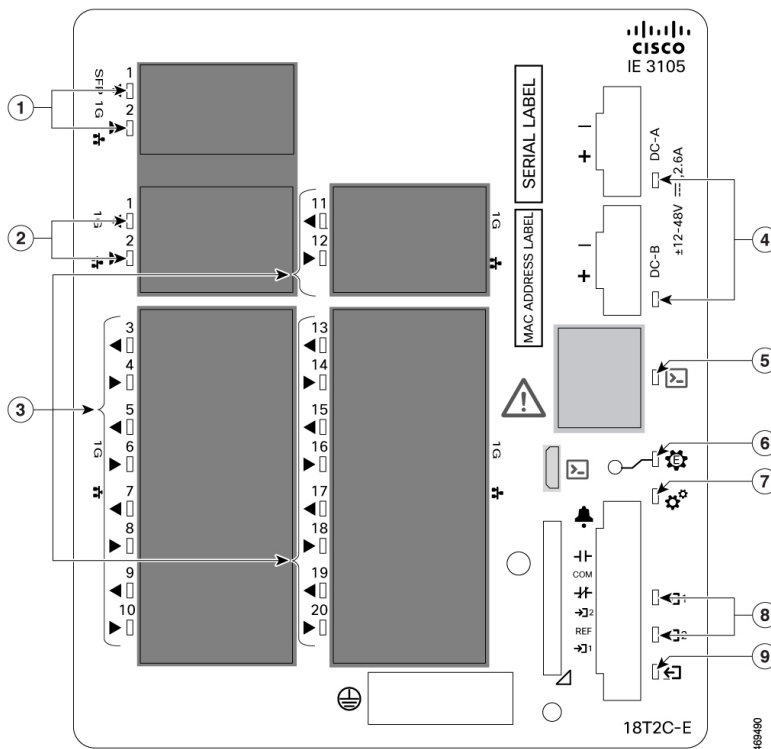


Number	Feature	Number	Feature
1	Dual-media SFP ports (uplinks)	6	Power connectors A and B
2	Dual-media copper ports (uplinks)	7	RJ-45 console connector
3	1000BASE-T ports (downlinks)	8	Express Setup button
4	SD card slot and USB micro port cover	9	Alarm connector
5	Protective ground connection		



Note In the preceding table, No. 2, dual-media copper ports (uplinks), refer to all models of Cisco Catalyst IE3100 Rugged Series Switches except for IE-3100-8T4S-E switches. For IE-3100-8T4S-E switches, the No. 2 ports refer to SFP ports 3 and 4.

Figure 2: IE-3105-18T2C-E LEDs



Number	Feature	Number	Feature
1	Dual-media SFP port LEDs	6	Express Setup LED
2	Dual-media copper port LEDs	7	System LED
3	1000BASE-T port LEDs	8	Alarm input LEDs
4	Power connector LED	9	Alarm output LED
5	Management console LED		



Note In the preceding table, No. 2, dual-media copper LEDs, refer to all models of Cisco Catalyst IE3100 Rugged Series Switches except for IE-3100-8T4S-E switches. For IE-3100-8T4S-E switches, the No. 2 LEDs refer to the LEDs for SFP ports 3 and 4.

Switch Ports

Uplink Ports

This section describes the uplink ports on Cisco Catalyst IE3100 Rugged Series Switches. The ports vary depending on the switch model.

1000BASE-T/1000BASE-X Dual-Media Ports

Dual-media ports include SFP and copper uplink ports. The SFP ports support 1-Gb and 100-Mb modules. The copper ports support 1000BASE-T, 100BASE-TX, and 10BASE-T, with autonegotiation, auto-MDIX, and cable diagnostics on an RJ-45 connector.

By default, the SFP interface has the higher priority if both the RJ-45 and the SFP interfaces are active. You can override the default priority with the CLI command **media-type SFP / RJ45**.

IE-3100-8T2C-E, IE-3100-18T2C-E, IE-3105-8T2C-E, and IE-3105-18T2C-E switches support dual-media ports.

Gigabit Ethernet SFP Only Ports

Gigabit SFP uplink ports support 1-Gb SFP and 100-Mb SFP modules. SFPs installed in these ports can draw up to 825mW each.

IE-3100-4T2S-E is the only switch model that has gigabit SFP only ports.



Note

- Refer to the [Cisco Catalyst IE3100 Rugged Series Data Sheet](#) and the [Cisco Optics-to-Device Compatibility Matrix](#) for details about the supported SFP Modules.
 - For installation instructions, see your SFP module documentation and the section [Installing and Removing SFP Modules](#).
- For cable specifications, see the section [SFP Module Cables, on page 66](#).

Downlink Ports

All Cisco Catalyst IE3100 Rugged Series Switches have gigabit 1000BASE-T ports that support 1000BASE-T, 100BASE-TX, and 10BASE-T with autonegotiation, auto-MDIX, and cable diagnostics on an RJ-45 connector.

The number of downlink ports varies depending on the switch model. See [Cisco Catalyst IE3100 Rugged Series Switches, on page 1](#) for more information.

Port Status LEDs

Each Ethernet port has a port LED that displays information about the individual port. The dual-media ports have two LEDs, one by the SFP connector and the second by the RJ-45 connector.

Table 1: Port Status LED States

LED State	Port Status
Off	No link, or the port is administratively shut down.

LED State	Port Status
Green	Link present, but no activity.
Blinking green	Activity: Port is sending or receiving data.
Alternating green and 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 remain amber for up to 30 seconds as STP checks the switch for possible loops.

Management Ports

You can connect the switch to a computer running Microsoft Windows or to a terminal server through either of the two console ports on the front panel. One is an RS-232 port with an RJ-45 connector and the other is a USB micro-Type B port. The USB port is behind a door that also covers the SD card slot.

The RS-232 console port uses an RJ-45-to-DB9 female cable. The USB console port uses a USB Type B-to-5-pin micro-Type B cable. The USB-micro console interface speeds are the same as the RJ-45 console interface speeds.

By default, the USB console is the active input whenever the USB console is connected, and the RJ-45 console is active when the USB console is not plugged in.

To use the USB-micro console port, you must install the Cisco Windows USB device driver on the device that is connected to the USB-micro console port and that is running Microsoft Windows.

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 requires no special drivers.

Management Port LED

The two management ports share a console LED, which shows which console port is in use. If both RS-232 and USB ports are connected, the USB port has priority, unless you have disabled the USB console.

Table 2: Management Port LED States

LED State	Port Status
Off	The USB port is not active; the RJ-45 port is active.
Green	The RJ-45 port is active; the USB port is not active.

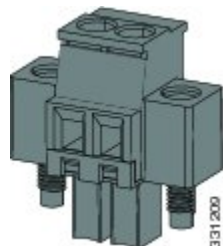
Power Connectors

Each Cisco Catalyst IE3100 Rugged Series Switch supports 9.6–60V DC DIN rail power inputs, which provide active-standby redundancy. The input with the higher voltage supplies all the power to the switch.

You connect power to the switch through the front panel connectors. The switch has a dual-feed DC power supply: Two connectors provide primary and secondary DC power (DC-A and DC-B). Each input has an independent screw terminal and an LED status indicator.

The DC power connectors are near the top right of the front panel. The power connector labeling is on the panel. The positive DC power connection is labeled “+”, and the return connection is labeled “-”.

Figure 3: Power Connector



The switch can operate with a single power source or with dual power sources. When both power sources are working, the switch draws power from the DC source with the higher voltage. If one of the two power sources fail, the other continues to power the switch.

In systems configured with the redundant power option, connect each of the two power supplies to separate independent power sources. If you fail to do this, your system might be susceptible to total power failure due to a fault in the external wiring or a tripped circuit breaker.

The following table shows the power connector LED states and what they mean.

Table 3: Power Connector LED States

LED State	Power Status
Off	Power is not present on the associated circuit.
Green	Power is present on the associated circuit.
Red	Power is not present on the associated circuit, and the switch configured for dual-input power.

System LED

The System LED shows whether the system is receiving power and is working properly.

Table 4: System LED States

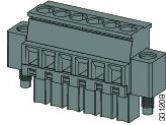
LED State	System Status
Off	System is not powered on.
Blinking green	Power-on self-test (POST) is in progress.
Green	System is operating normally.
Red	System is receiving power but is not functioning properly.

Alarms

You connect the alarm signals to the Cisco Catalyst IE3100 Rugged Series Switch through the alarm connector. The switch has two dry-contact alarm inputs and one dry-contact Form-C relay alarm output.

The alarm connector attached to the bottom right of the front panel with provided captive screws. It provides six alarm wire connections.

Figure 4: Alarm Connector



The alarm inputs are electrically isolated from system ground to prevent ground loops, but the inputs are not isolated from each other. The alarm output is isolated from system ground and from the alarm inputs. The alarm output supports signal levels of up to 48 VDC.

Both alarm input circuits can sense if the alarm input is open or closed. The alarm inputs can be activated for environmental, power supply, and port status alarm conditions. From the CLI, you can configure each alarm input as an open or closed contact.

The alarm output circuit is a relay with a normally open and a normally closed contact. The switch is configured to detect faults that are used to energize the relay coil and change the state on both of the relay contacts: normally open contacts close, and normally closed contacts open. The alarm output relay can be used to control an external alarm device, such as a bell or a light.

There is a separate LED for each of the two inputs and for the output.

Table 5: Alarm LED States

LED State	Alarm Status
Alarm Input A and B	
Off	Alarm not configured.
Green	Alarm configured but no alarm detected.
Red	Minor alarm present.
Blinking red	Major alarm present.
Alarm output	
Off	Alarm not configured.
Green	Alarm not present.
Red	Minor alarm condition present.
Blinking red	Major alarm condition present.

Express Setup Button

Express Setup is a web-based procedure to configure initial IP address information to the new switch. It provides a simple way to manage the switch and connect it to an existing network of local routers and the internet.

The Cisco Catalyst IE3100 Rugged Series Switch front panel has an Express Setup button and a setup LED. The button is recessed to prevent accidental activation; you need a paper clip or similar object to press it. You trigger different Express Setup features by varying the amount of time that you press the button.

Table 6: Express Setup Modes

Mode	Seconds Required to Trigger Mode	Description
Short Press	1 to 5	Places the switch into Express Setup mode.
Medium Press	6 to 10	Causes the switch to start DHCP discovery phase on the VLAN1 interface.
Long Press	16 to 20	Causes the switch to erase its startup configuration and reload. This in turn causes the switch to revert to its Day 1 default configuration.

When you first set up the switch, we recommend that you 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 more configuration.

For more information, see the "Running Express Setup" chapter in this guide.

Express Setup LED

The Express Setup LED on the front of the switch displays the express setup mode for the initial configuration. The following table shows the LED states and what they mean.

Table 7: Express Setup LED States

LED State	Switch Status
Off	Switch is configured as a managed switch.
Solid green	Switch is operating normally.
Blinking green	Switch is in initial setup, in recovery, or initial setup is incomplete.
Red	Switch failed to start initial setup or recovery because there is no available switch port to which to connect the management station. Disconnect a device from a switch port, and then press the Express Setup button.

SD Card Connector

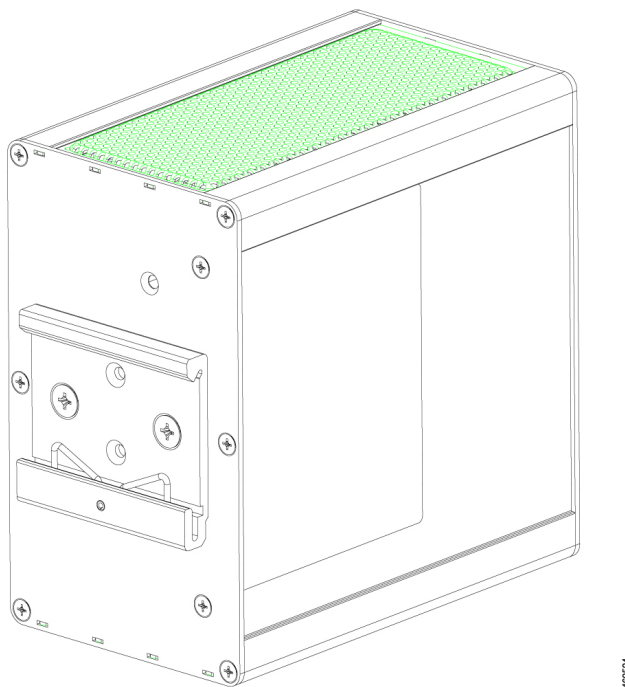
The switch supports an SD card that makes it possible to replace a failed switch without configuring the replacement switch. You can also use the SD card to copy files on and off the system.

The connector is on the front of the switch, behind a cover that protects the SD card and holds it in place. The cover also protects the USB console port.

Rear Panel

The rear panel of the switch has a latch for installation on a DIN rail. The latch is spring-loaded to move down to position the switch over a DIN rail and return to the original position to secure the switch to a DIN rail.

Figure 5: Rear of Cisco Catalyst IE3100 Rugged Series Switches



Management Options

The switch supports these management options:

- Web UI

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

- Cisco IOS XE CLI

The switch CLI is based on Cisco IOS XE software and is enhanced to support desktop-switching features. You can fully configure and monitor the switch. You can access the CLI either by connecting your management station directly to the switch management port, or a console port, or by using Telnet from a remote management station. See the switch command reference on Cisco.com for more information.

- SNMP network management

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

- Common Industrial Protocol

The Common Industrial Protocol (CIP) management objects are supported. Cisco Catalyst IE3100 Rugged Series Switches can be managed by CIP-based management tools, allowing the user to manage an entire industrial automation system with one tool.

- PROFINET

- TCP/IP and RT

This switch supports PROFINET TCP/IP and RT and can be managed by Siemens' automation software such as STEP 7 and TIA Portal.



CHAPTER 2

Switch Installation

- [Preparing for Installation, on page 13](#)
- [Install or Remove the Flash Memory Card \(Optional\), on page 18](#)
- [Connecting to a Console Port, on page 20](#)
- [Connecting to Power, on page 25](#)
- [Installing the Switch, on page 40](#)
- [What to Do Next, on page 61](#)

Preparing for Installation

Warnings

Be aware of the following warnings for installing Cisco Catalyst IE3100 Rugged Series Switches. These warnings are translated into several languages in the Regulatory Compliance and Safety Information for this switch.



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

Avertissement :

Avant de travailler sur un appareil raccordé au réseau électrique, retirez vos bijoux (y compris bagues, colliers et montre). En cas de contact avec l'alimentation et la mise à la terre, les objets métalliques peuvent chauffer et provoquer de graves brûlures ou encore se souder aux terminaux. Énoncé 43



Warning Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

Avertissement :

Ne travaillez pas sur le système ou ne branchez pas ni ne débranchez de câbles pendant un orage. Énoncé 1001



Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Avertissement :

Avant d'exécuter une de ces procédures, assurez-vous que l'alimentation du circuit CC est coupée. Énoncé 1003



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

Avertissement :

Lisez les instructions d'installation avant de brancher le système à sa source d'alimentation. Énoncé 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

Avertissement :

Cet appareil est conçu pour une installation dans les zones à accès limité. Une zone à accès limité est accessible uniquement si vous utilisez un outil, une clé et un verrou spéciaux ou d'autres moyens de protection. Énoncé 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

Avertissement :

Cet équipement doit être mis à la terre. Ne supprimez jamais le conducteur de mise à la terre et n'utilisez jamais l'appareil en l'absence d'un conducteur de mise à la terre installé convenablement. Communiquez avec l'organisme d'inspection électrique approprié ou avec un maître-électricien si vous n'êtes pas sûr que la mise à la terre est adéquate. Énoncé 1024



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

Avertissement :

Il se peut que cet appareil ait plus d'une connexion de bloc d'alimentation. Pour mettre l'appareil hors tension, vous devez débrancher toutes les connexions. Énoncé 1028

**Warning**

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

Avertissement :

Toute installation, tout remplacement ou toute réparation de cet équipement doit être effectué par un personnel qualifié et compétent. Énoncé 1030

**Warning**

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

Avertissement :

L'élimination finale de ce produit doit être effectuée conformément à toutes les réglementations et lois nationales. Énoncé 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

Avertissement :

Pour les connexions extérieures au bâtiment équipé, les ports suivants doivent être connectés à un point approuvé de terminaison de réseau, avec protection complète du circuit. Énoncé 1044 pour Ethernet 10/100/1000

**Warning**

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature, 60°C/140°F. Statement 1047

Avertissement :

Pour éviter toute surchauffe du système, il est recommandé de maintenir une température ambiante inférieure à 60 °C/140 °F. Énoncé 1047

**Warning**

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

Avertissement :

Installez l'équipement en respectant les réglementations locales et nationales en matière de câblage. Énoncé 1074



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

- Top and bottom: 1.0 in. (25.4 mm)
- Sides: 1.0 in. (25.4 mm)
- Front: 1.0 in. (25.4 mm)

Attention :

- Haut et bas : 25,4 mm (1,0 po)
- Sur les côtés : 25,4 mm (1,0 po)
- Devant : 25,4 mm (1,0 po)

Installation Guidelines

When determining where to place the switch, observe the guidelines. in this section.

Environmental and Enclosure Guidelines

Review the following environmental and enclosure guidelines before installation:

- This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 9842 ft (3 km) without derating.
- This equipment is considered Group 1, Class A industrial equipment, according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.
- 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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame-spread rating of 5VA, V2, V1, V0 (or equivalent) if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication might contain additional information about specific enclosure-type ratings that are required to comply with certain product safety certifications.

General Guidelines

Observe these general guidelines before installation:

If you are responsible for the application of safety-related programmable electronic systems (PES), you must be aware of the safety requirements in the application of the system and be trained in using the system.



Caution Proper ESD protection is required whenever you handle Cisco equipment. Installation and maintenance personnel should be properly grounded by using ground straps to eliminate the risk of ESD damage to the switch.

Attention :

Une protection contre les décharges électrostatiques appropriée est nécessaire chaque fois que vous manipulez de l'équipement Cisco. Le personnel responsable de l'installation et de la maintenance doit être correctement protégé à l'aide de bracelets de mise à la terre afin d'éliminer tout risque de décharge électrostatique sur le commutateur.



Caution Do not touch connectors or pins on component boards. Do not touch circuit components inside the switch. When not in use, store the equipment in appropriate static-safe packaging.

Attention :

Ne touchez pas les connecteurs ou les broches des cartes de composants. Ne touchez pas les composants du circuit à l'intérieur du commutateur. Lorsque vous ne l'utilisez pas, rangez l'équipement dans un emballage protégeant contre l'électricité statique approprié.



Caution The device is designed to mount on a DIN rail that conforms to Standard IEC/EN60715.

Attention :

L'appareil est conçu pour être monté sur un rail DIN conforme à la norme IEC/EN60715.

When determining where to place the switch, observe the following guidelines:

- Before installing the switch, first verify that the switch is operational by observing that the system LED becomes green. Follow the procedures in the section [Verifying the Switch Operation](#) in this chapter.
- For 10/100 ports and 10/100/1000 ports, the cable length from a switch to an attached device cannot exceed 328 feet (100 meters).
- For 100BASE-FX fiber-optic ports, the cable length from a switch to an attached device cannot exceed 6562 ft (2 km).
- Ensure that the operating environment is within the ranges that are listed in the chapter Technical Specifications.
- Ensure that the clearance to front and rear panels meets the following conditions:
 - Front-panel LEDs can be easily read.
 - Access to ports is sufficient for unrestricted cabling.
 - Front-panel direct current (DC) power connectors and the alarm connector are within reach of the connection to the DC power source.
- Ensure that the temperature surrounding the unit does not exceed 140°F (60°C).

**Note**

- When the switch is installed in an industrial enclosure, the temperature within the enclosure is greater than normal room temperature outside the enclosure.
- The temperature inside the enclosure cannot exceed 140°F (60°C), the maximum ambient enclosure temperature of the switch.

- Ensure that cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures.

Verifying the Package Contents

The shipping box contains the model of the switch you ordered and other components that you need for installation. Some components are optional, depending on your order.

**Note**

Verify that you have received these items. If any item is missing or damaged, contact your Cisco representative or reseller for instructions.

Install or Remove the Flash Memory Card (Optional)

Software and firmware are stored on the internal flash memory in Cisco Catalyst IE3100 Rugged Series Switches. Optionally, you can order and install an SD memory card (SD-IE-4GB) to store the software and the configuration changes. If you must replace the switch, you can simply insert the SD memory card instead of configuring the new switch.

**Warning**

Do not insert or remove the flash card 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 379

Avertissement :

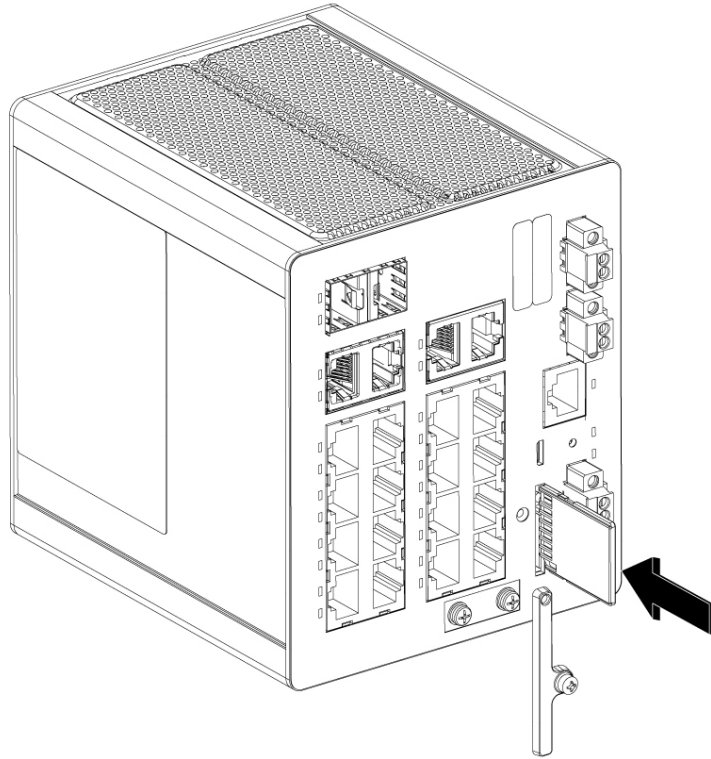
N'insérez pas et ne retirez pas la carte de mémoire flash lorsque l'appareil est sous tension; un arc électrique peut se produire. Cela risque d'entraîner une explosion dans les installations situées dans des zones dangereuses. Avant de poursuivre, assurez-vous que l'alimentation est coupée ou que la zone est sécurisée. Énoncé 379

To install or replace the flash memory card, complete the following steps:

- Step 1** On the front of the switch, locate the door that protects the flash memory card slot.
The door covers both the flash memory card slot and the USB micro type-B port.
- Step 2** Loosen the captive screw at the top of the door using a Phillips screwdriver to open the door.
- Step 3** Install or remove the card:

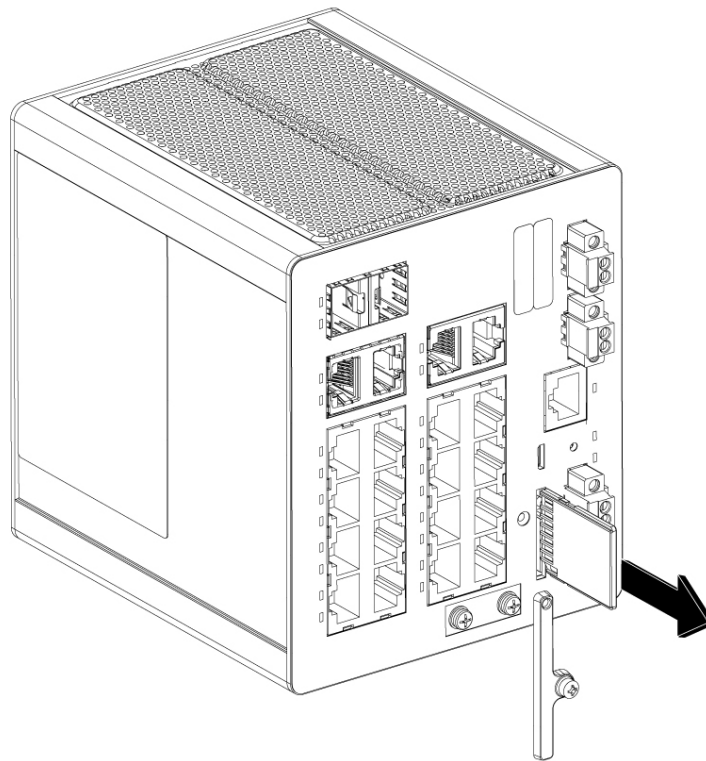
- **a.** To install a card, slide it into the slot, and press it in until it clicks in place. The card is keyed so that you cannot insert it the wrong way.

Figure 6: Installing the Flash Memory Card in the Switch



- **b.** Close the guard door and fasten the captive screw using a Phillips screwdriver to keep the door in place.
- **a.** To remove the card, push it in until it releases for it to pop out.

Figure 7: Removing the Flash Memory Card from the Switch



- b. Place the card in an antistatic bag to protect it from static discharge.

Connecting to a Console Port

You can connect to a console port using one of two methods:

- [Connect to the RJ-45 Console Port](#)
- [Connect to the USB Micro-Type B Console Port](#)

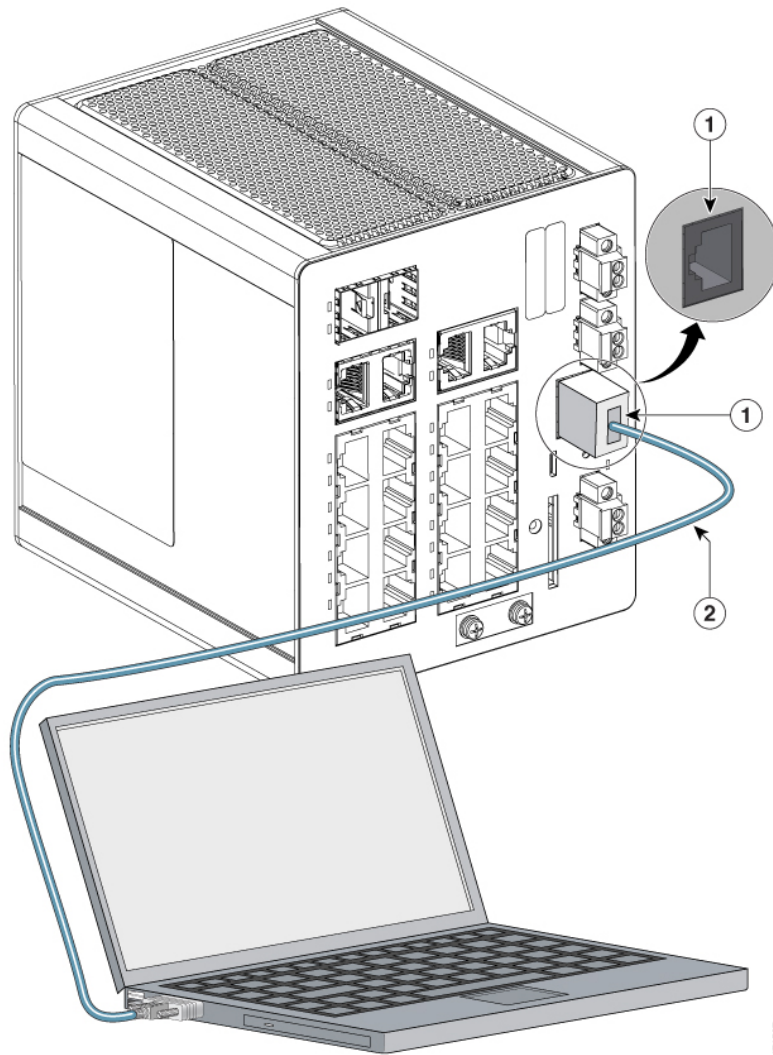
Connect to the RJ-45 Console Port

Complete the following steps to connect to the RJ-45 console port.

- Step 1** Connect the RJ-45-to-DB-9 adapter cable to the 9-pin serial port on the PC.
- Step 2** Connect the other end of the cable to the switch console port.

The following illustration shows the connections in Step 1 and Step 2.

Figure 8: Connecting the Console Cable to the RJ-45 Console Port



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

Step 3 Start the terminal-emulation program on the PC or the terminal.

The program, frequently a PC application such as HyperTerminal or PuTTY, makes communication between the switch and your PC or terminal possible.

Step 4 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 5 Connect power to the switch as described in the section Connecting to Power.

The PC or terminal displays the bootloader sequence.

Step 6 Press Enter to display the setup prompt.

What to do next

Follow the steps in the section Completing the Setup Program.

Connect to the USB Micro-Type B Console Port

Complete the following steps to access the CLI through the USB Micro Type B console port.

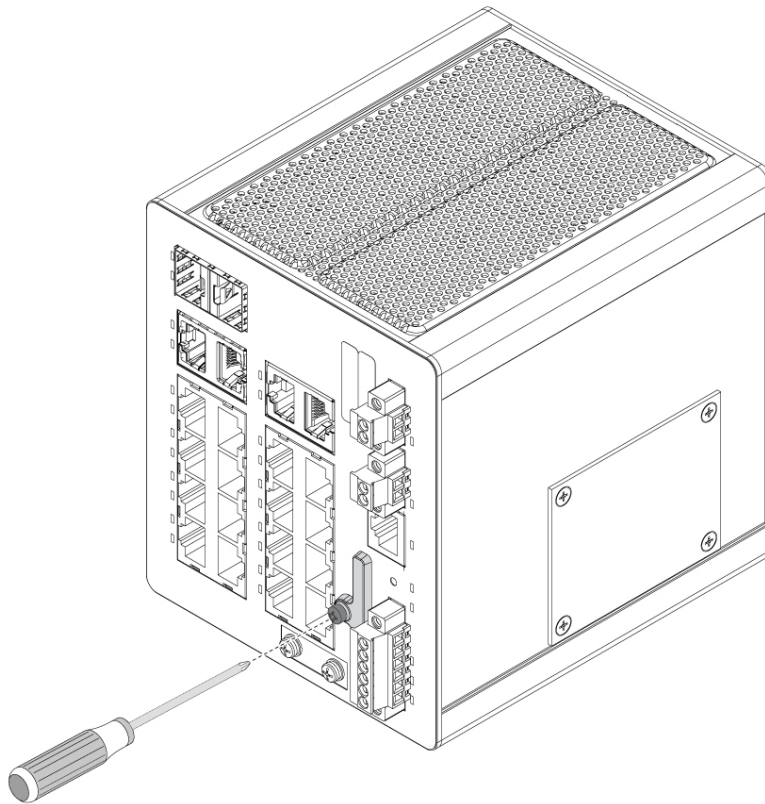
Before you begin

If you are connecting the switch USB-micro console port to a Windows-based PC for the first time, install a USB driver.

Step 1 Use a Phillips screwdriver to loosen the captive screw on the cover of the USB micro type B console port, as shown in the following illustration.

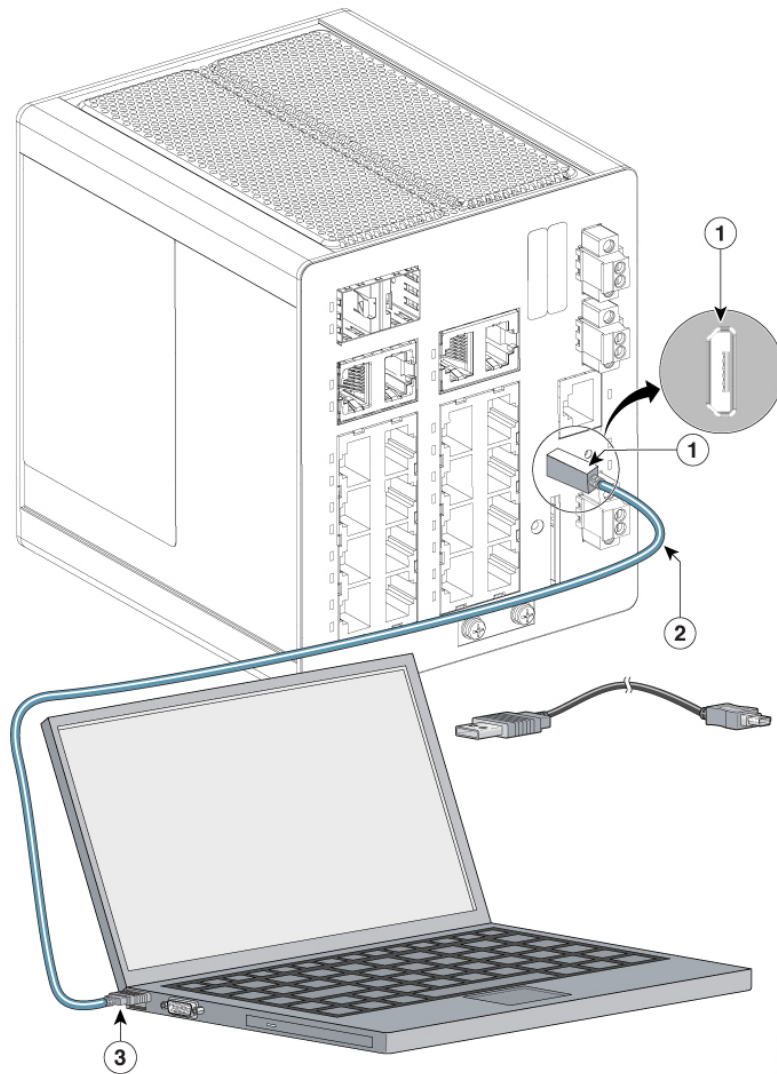
The USB port shares its cover with the SD card connector.

Figure 9: Loosening the Cover



- Step 2** Remove the cover.
- Step 3** Connect a USB cable to the PC USB port.
- Step 4** Connect the other end of the cable to the switch micro-B (5-pin connector) USB-micro console port, as shown in the following illustration.

Figure 10: Connecting the USB-Micro Console Cable



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

Step 5

Identify the COM port that is assigned to the USB-mini console port:

- Choose **Start > Control Panel > System>**.
- Click the Hardware tab and choose Cisco Device Manager, and then expand the Ports section.

The assigned COM port appears in parentheses at the end of the line with this entry: Cisco USB System Management Console.

Step 6

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 7** Configure the COM port.
- Step 8** 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 9** Connect power to the switch, following the procedure in the section [Connecting to Power](#).
- Step 10** When the PC or terminal displays the bootloader sequence, press **Enter** to display the setup prompt.
- Step 11** Follow the steps in [Completing the Setup Program](#).
-

Connecting to Power

In systems configured with the redundant power option, connect each of the two power supplies to separate independent power sources. If you fail to do this, your system might be susceptible to total power failure due to a fault in the external wiring or a tripped circuit breaker.

Tools and Equipment

Obtain the necessary tools and equipment:

- Ratcheting torque flathead screwdriver that exerts up to 15 in-lb (1.69 N-m) of pressure.
- For the protective ground connector, obtain a single or pair of stud size 6 ring terminals (such as Hollingsworth part number R3456B or equivalent).
- Crimping tool (such as Thomas & Bett part number WT2000, ERG-2001, or equivalent).
- 10-gauge copper ground wire.
- For DC power connections, use UL- and CSA-rated, style 1007 or 1569 twisted-pair copper appliance wiring material (AWM) wire.
- Wire-stripping tools for stripping 10- and 18-gauge wires.
- A number-2 Phillips screwdriver.
- A flat-blade screwdriver.

Supported Power Supplies

Cisco is constantly updating the IoT Power Supply portfolio. Please refer to the [Cisco Industrial Din-Rail Power Supplies Data Sheet](#) for a comprehensive list of supported power supplies and their capabilities.

Installing the Power Converter

You install the power converter on a DIN rail, wall, or rack as you would a switch module.



Note The following warning applies only to installation in hazardous locations.



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

Avertissement :

Cet équipement est fourni en tant qu'équipement de « type ouvert ». Il doit être monté dans un boîtier spécialement conçu pour les conditions environnementales spécifiques qui seront présentes et conçu de manière à éviter les blessures corporelles découlant de l'accessibilité aux pièces sous tension. L'intérieur du boîtier ne doit être accessible qu'à l'aide d'un outil. Le boîtier doit être conforme aux normes minimales de protection IP54 ou NEMA de type 4 pour boîtier. Énoncé 1063



Caution To prevent the switch assembly from overheating, there must be a minimum of 1.0 inch (25.4 mm) between any other device and the top, bottom, or sides of the switch assembly.

Attention :

Pour éviter que le commutateur ne surchauffe, il doit y avoir un minimum de 25,4 mm (1,0 po) entre tout autre appareil et le haut, le bas ou les côtés du commutateur.

Ground the Switch

Complete the steps in this section to ground the switch to earth ground by using the ground screw. Be sure to follow the grounding requirements of your site.

The ground lug is not supplied with the switch. You can use one of the following options:

- Single ring terminal
- Two single ring terminals

Before you begin

Read and understand the following warnings and cautions:

**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

Avertissement :

Cet équipement doit être mis à la terre. Ne supprimez jamais le conducteur de mise à la terre et n'utilisez jamais l'appareil en l'absence d'un conducteur de mise à la terre installé convenablement. Communiquez avec l'organisme d'inspection électrique approprié ou avec un maître-électricien si vous n'êtes pas sûr que la mise à la terre est adéquate. Énoncé 1024

**Warning**

This equipment is intended to be grounded to comply with emission and immunity requirements. Ensure that the switch functional ground lug is connected to earth ground during normal use. Statement 1064

Avertissement :

Cet équipement doit être relié à la terre pour répondre aux exigences en matière d'émissions et d'immunité. Vérifiez que la cosse de mise à la terre fonctionnelle du commutateur est bien connectée à la terre pendant l'utilisation de l'équipement. Énoncé 1064

**Caution**

To ensure that the equipment is reliably connected to earth ground, follow the grounding procedure instructions, and use a UL-listed ring terminal lug suitable for number 10-to-12 AWG wire, such as Hollingsworth part number R3456B or equivalent).

Attention :

Pour vous assurer que l'équipement est branché de manière fiable à la prise de terre, suivez les instructions de la procédure de mise à la terre et utilisez une cosse à anneau homologuée UL adaptée aux câbles de calibre AWG 10 à 12 (comme la pièce Hollingsworth numéro R3456B ou l'équivalent).

**Caution**

Use at least a 4-mm² conductor to connect to the external grounding screw.

Attention :

Utilisez un conducteur d'au moins 4 mm² pour la connexion à la vis extérieure de mise à la terre.

Step 1

Use a standard Phillips screwdriver or a ratcheting torque screwdriver with a Phillips head to remove the ground screw from the front panel of the switch.

Store the ground screw for future use.

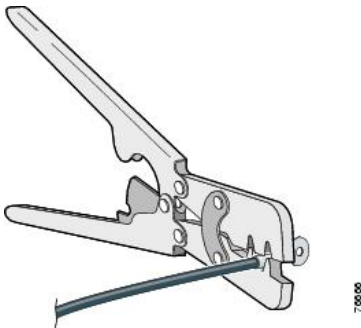
Step 2

Use the manufacturer's guidelines to determine the wire length to be stripped.

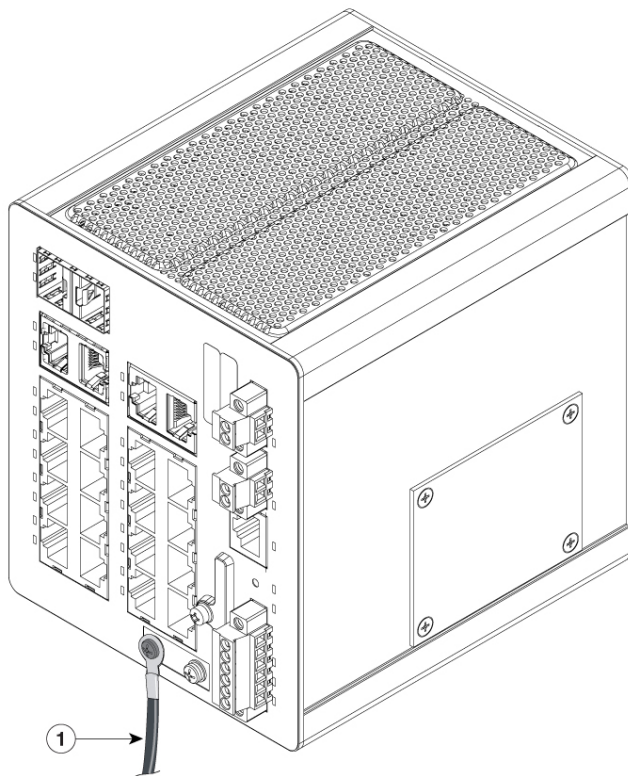
Step 3

Insert the ground wire into the ring terminal lug, and using a crimping tool, crimp the terminal to the wire, as shown in the following illustration.

If two ring terminals are being used, repeat this action for a second ring terminal.

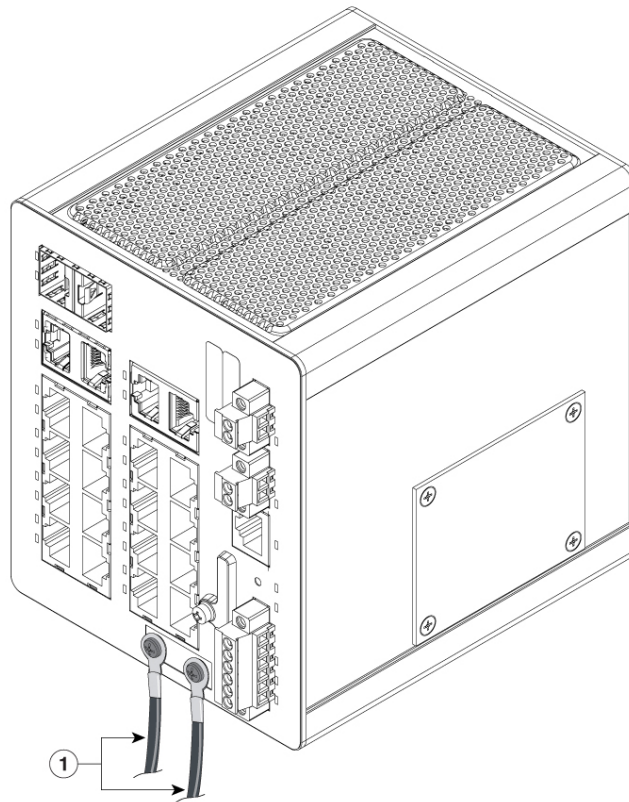
Figure 11: Crimping the Ring Terminal

- Step 4** Slide the ground screw through the terminal.
- Step 5** Insert the ground screw into the functional ground screw opening on the front panel.
- Step 6** Use a ratcheting torque screwdriver to tighten the ground screws and ring terminal to the switch front panel to 3.5 in-lb (0.4 N-m).
- Note** Do not exceed 3.5 in-lb (0.4 N-m) of torque.

Figure 12: Installing the Ground-Lug Screw (Single Ring Terminal)

1	Ground cable
---	--------------

Figure 13: Installing the Ground-Lug Screws (Two Single Ring Terminals)



1	Ground cables
---	---------------

Step 7 Attach the other end of the ground wire to a grounded bare metal surface, such as a ground bus, a grounded DIN rail, or a grounded bare rack.

Connecting the Power Converter to an AC Power Source

The following two sections describe the steps that are required to connect the power converter to an AC power source.

Preparing the AC Power Connection

To connect the power converter to an AC power source, you need an AC power cord. Power cord connector types and standards vary by country. Power-cord wiring color codes also vary by country. You must have a qualified electrician elect, prepare, and install the appropriate power cord to the power supply.

Use copper conductors, rated at a minimum temperature of 86°F (30°C) above the operating ambient temperature.



Note This section does not apply to PWR-IE50W-AC-IEC, which has pluggable IEC connector.

Connect the AC Power Source to the Power Converter

Complete the following steps to connect the AC power source to the power converter.



Caution AC power sources must be dedicated AC branch circuits. Each branch circuit must be protected by a dedicated two-pole circuit breaker.

Attention :

Les sources d'alimentation CA doivent être des circuits de dérivation CA dédiés. Chaque circuit de dérivation doit être protégé par un disjoncteur bipolaire dédié.



Caution Do not turn on AC power until the wiring is secured.

Attention :

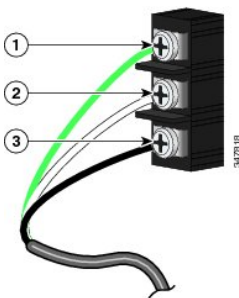
Ne mettez pas sous tension CA tant que le câblage n'est pas sécurisé.

Step 1 Remove the plastic cover from the input power terminals and set it aside.

Step 2 Insert the exposed ground wire lead into the power converter ground wire connection.

Ensure that only wire with insulation extends from the connector, as shown by item 1 in the following illustration. The position of the power converter can vary on different switch models.

Figure 14: Connecting AC Power



1	Ground	3	AC line
2	AC neutral		

Step 3 Tighten the ground wire terminal block screw.

Note Torque to 8 in.-lb, not to exceed 10 in.-lb.

- Step 4** Insert the line and neutral wire leads into the terminal block line and neutral connections, as shown by item 2 and item 3 in the preceding illustration.
- Ensure that you cannot see any wire lead, and that only wire with insulation extends from the connectors.
- Step 5** Tighten the line and neutral terminal block screws to 8 in.-lb torque.
- Note** Do not exceed 10 in.-lb torque.
- Step 6** Replace the plastic cover over the terminal block.
- Step 7** Connect the other end of the wiring to your AC power source.

Connect the Power Converter to a DC Power Source

You can also connect the power converter to a DC power source. Several power supplies can be used.



Warning

Use a minimum of 18 to 20 AWG (from .08 to .05 mm²) twisted pair supply wires suitable for minimum 104°F (40°C) above ambient temperature.



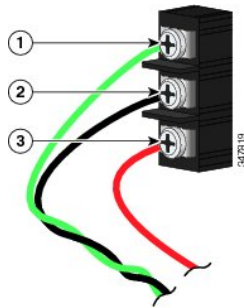
Note

Most power supplies are compatible with the procedure in this section. However, details of the procedure may vary from power supply to power supply. These include the 480W, 240W, and 50W power supplies. For connection details and other information about these power supplies, see the [Cisco Industrial Din-Rail Power Supplies Data Sheet](#) on Cisco.com.

-
- Step 1** Measure a single length of stranded copper wire long enough to connect the power converter to the earth ground.
- The wire color differs depending on country.
- For connections from the power converter to earth ground, use shielded 18-AWG stranded copper wire.
- Step 2** Measure a length of twisted-pair copper wire long enough to connect the power converter to the DC power source.
- For DC connections from the power converter to the DC source, use 18-AWG twisted-pair copper wire, such as Belden part number 9344 or the equivalent.
- Step 3** Using an 18-gauge wire-stripping tool, strip the ground wire and both ends of the twisted-pair 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 wires. Stripping more than the recommended amount of wire can leave exposed wire from the power and relay connector after installation.
- Step 4** Connect one end of the stranded copper wire to a grounded bare metal surface, such as a ground bus, a grounded DIN rail, or a grounded bare rack.
- Step 5** Insert the other end of the exposed ground wire lead into the earth-ground wire connection on the power converter terminal block.
- Ensure that only wire with insulation extends from the connection, as shown by item 1 in the following illustration.

The position of the power converter varies on different switch models.

Figure 15: AC/DC Power Input Terminal Block Wire Connections to a DC Source



1	Earth ground wire connection	3	Positive DC connection
2	Return wire connection (to DC return)		

Warning An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the power and relay connector. Statement 122

Avertissement :

Un fil de câble exposé, connecté à une source d'alimentation d'entrée CC peut conduire à des niveaux d'électricité nocifs. Assurez-vous qu'aucune partie exposée du câble connecté à la source d'alimentation d'entrée CC ne s'étend de la prise du connecteur de relais et d'alimentation. Enoncé 122

Step 6 Tighten the earth-ground wire connection terminal block screw to 8 in.-lb torque.

Note Do not exceed 10 in.-lb torque.

Step 7 Complete the following steps to Insert the wire leads, referring to the preceding illustration.

Ensure that only wire with insulation extends from the connectors, as shown in the preceding illustration.

- a) Insert the twisted-pair wire leads into the terminal block line and neutral connections.
- b) Insert the wire lead labeled number 1 into the neutral wire connection.
- c) Insert the wire lead labeled number 2 into the line wire connection.

Step 8 Tighten the line and neutral terminal block screws to 8 in.-lb torque.

Do not exceed 10 in.-lb torque.

Step 9 Connect the red wire to the positive pole of the DC power source, and connect the black wire to the return pole.

Ensure that each pole has a current-limiting-type fuse that is rated to at least 600 VAC/DC (such as the KLKD Midget fuse).

Wire the DC Power Source

Complete the following steps to wire the switch to a DC power source:

Before you begin

Read the following caution and warnings before wiring the switch the DC power source.



Caution For wire connections to the power and alarm connectors, you must use UL- and CSA-rated, style 1007 or 1569 twisted-pair copper appliance wiring material (AWM) wire (such as Belden part number 9318).

Attention :

Pour les connexions câblées aux connecteurs d'alimentation et d'alarme, vous devez utiliser du câble en cuivre à paire torsadée de type 1007 ou 1569 homologué UL et CSA (comme la pièce Belder numéro 9318).



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

Avertissement :

Un dispositif de déconnexion bipolaire à accès rapide doit être intégré au câblage fixe. Énoncé 1022



Warning This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 3A. Statement 1005

Avertissement :

Pour la protection contre les courts-circuits (surtension), ce produit utilise les dispositifs intégrés au bâtiment. Assurez-vous que le dispositif de protection ne dépasse pas 3 A. Énoncé 1005



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

Avertissement :

Installez l'équipement en respectant les réglementations locales et nationales en matière de câblage. Énoncé 1074



Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Avertissement :

Avant d'exécuter une de ces procédures, assurez-vous que l'alimentation du circuit CC est coupée. Énoncé 1003



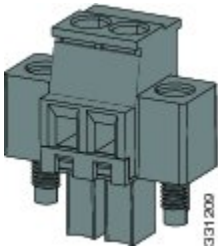
Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Avertissement :

Toute installation, tout remplacement ou toute réparation de cet équipement doit être effectué par un personnel qualifié et compétent. Énoncé 1030

Step 1 Locate the two power connectors on the switch front panel labeled DC-A and DC-B, one of which is shown in the following illustration.

Figure 16: Power Connector



Step 2 Identify the connector positive and return DC power connections.

The labels for power connectors DC-A and DC-B are on the switch panel as shown in the following table.

Table 8: DC-A and DC-B Power Connector Labels

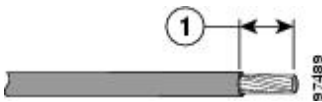
Label	Connection
+	Positive DC power connection
-	Return DC power connection

Step 3 Measure two strands of twisted-pair copper wire (18-to-20 AWG) long enough to connect to the DC power source.

Step 4 Using an 18-gauge wire-stripping tool, strip each of the two twisted pair wires coming from each DC-input power source 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 power connector after installation.

Figure 17: Stripping the Power Connection Wire

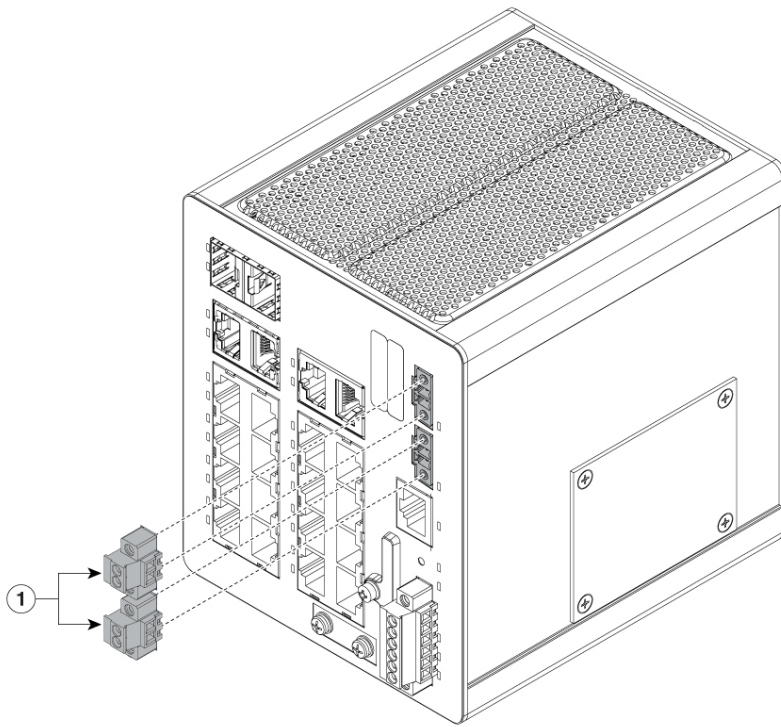


1	0.25 in. (6.3 mm) ± 0.02 in. (0.5 mm)
---	---------------------------------------

Step 5 Remove the two captive screws that attach the power connector to the switch, and remove the power connector.

Remove both connectors if you are connecting to two power sources, as shown in the following illustration.

Figure 18: Removing the Power Connectors from the Switch



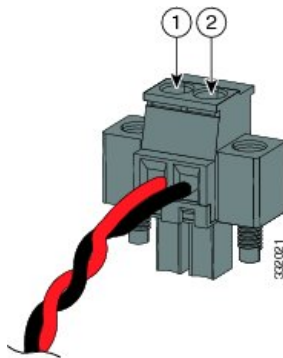
1	Power connectors
---	------------------

Step 6

On the power connector, insert the exposed part of the positive wire into the connection labeled “+” and the exposed part of the return wire into the connection labeled “-”; the connections are shown in the following illustration.

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

Figure 19: Inserting Wires in the Power Connector

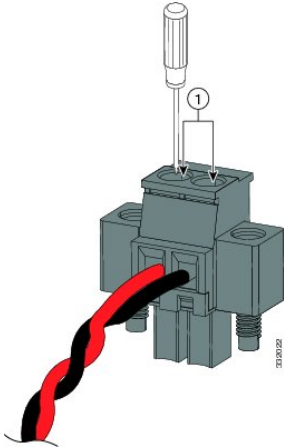


1	Power source positive connection	2	Power source return connection
---	----------------------------------	---	--------------------------------

Step 7 Use a ratcheting torque flathead screwdriver to torque the power connector captive screws (above the installed wire leads) to 2 in-lb (0.23 N-m), as shown in the following illustration.

Note Do not over-torque the power connector's captive screws. The torque should not exceed 2 inch-lbs (0.23 N-m).

Figure 20: Torquing the Power Connector Captive Screws



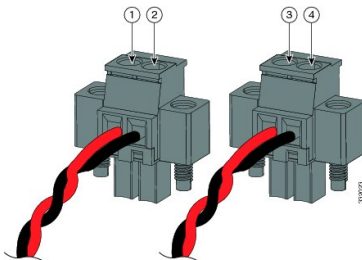
1	Power connector captive screws
---	--------------------------------

Step 8 Connect the other end of the positive wire to the positive terminal on the DC power source, and connect the other end of the return wire to the return terminal on the DC power source.

When you are testing the switch, one power connection is sufficient. If you are installing the switch and are using a second power source, repeat steps 4 through 8 using the second power connector.

The following illustration shows the completed DC-input wiring on a power connector for a primary power source and an optional secondary power source.

Figure 21: Completed DC Power Connections on the Power Connectors



1	Power source A positive connection	3	Power source B positive connection
2	Power source A return connection	4	Power source B return connection

For a -48 VDC power source, this table describes the wiring connections.

1	Power source A return connection	3	Power source B return connection
---	----------------------------------	---	----------------------------------

2	Power source A –48 VDC connection	4	Power source B –48 VDC connection
---	-----------------------------------	---	-----------------------------------

Attach the Power Connectors to the Switch

To attach the power connectors to the front panel of the switch, complete the following steps:

Step 1 Insert one power connector into the DC-A receptacle on the switch front panel, and the other into the DC-B receptacle, as shown in the following illustration.

Warning Failure to securely tighten the captive screws can result in an electrical arc if the connector is accidentally removed. Statement 397

Avertissement :

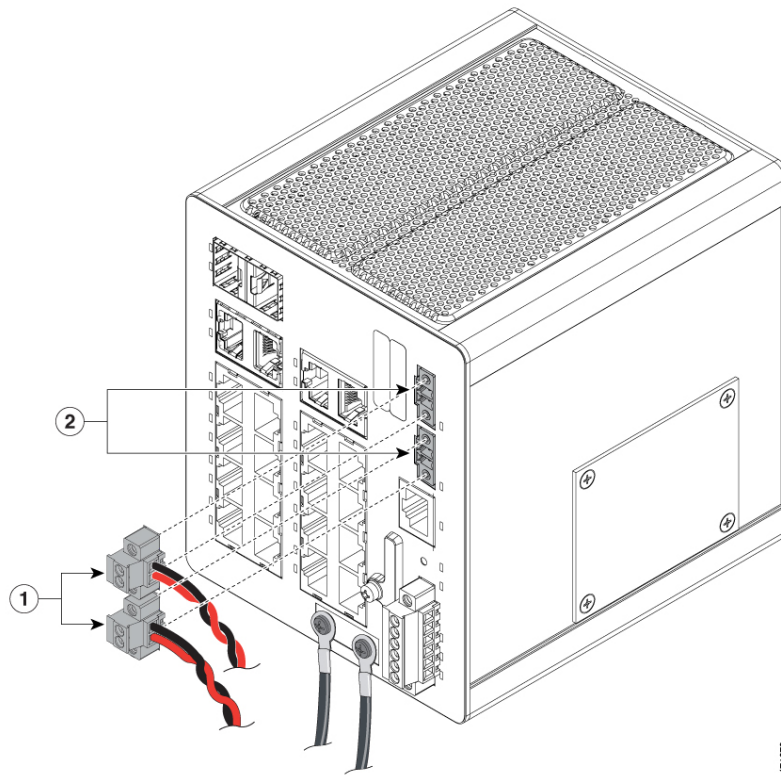
Ne pas serrer correctement les vis imperdables peut produire un arc électrique si le connecteur est accidentellement retiré. Énoncé 397

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

Avertissement :

Si vous branchez ou débranchez le connecteur d'alimentation ou d'alarme, un arc électrique risque de se produire. Cela risque d'entraîner une explosion dans les installations situées dans des environnements dangereux. Assurez-vous que le commutateur et tous les autres circuits ne sont pas sous tension. Avant de commencer, assurez-vous qu'il est impossible de brancher accidentellement l'alimentation électrique et vérifiez que la zone n'est pas dangereuse. Énoncé 1058

Figure 22: Attaching the Power Connectors to the Switch



1	DC-A power connectors	2	DC-A power connections
---	-----------------------	---	------------------------

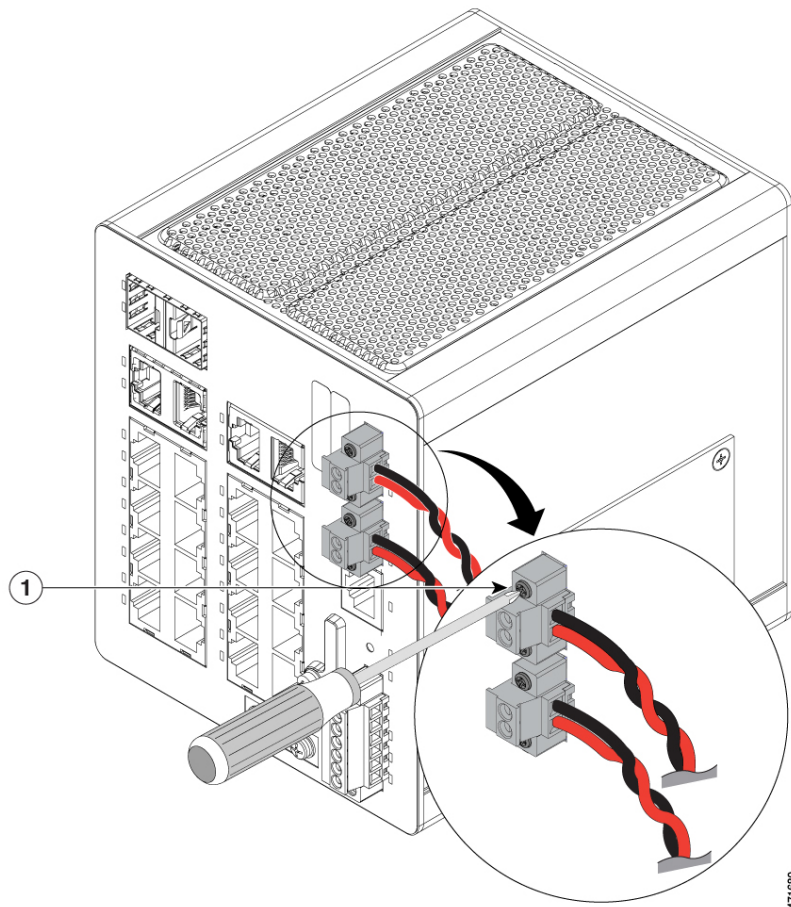
Step 2

Use a ratcheting torque flathead screwdriver to tighten the captive screws on the sides of the power connectors, as shown in the following illustration.

When you are testing the switch, one power source is sufficient. If you are installing the switch and are using a second power source, repeat this procedure for the second power connector (DC-B), which installs just below the primary power connector (DC-A).

When you are installing the switch, secure the wires coming from the power connector so that they cannot be disturbed by casual contact. For example, use tie wraps to secure the wires to the rack.

Figure 23: Tightening the Captive Screws



1	DC-A power connector upper captive screw
---	--

Apply Power to the Power Converter

Complete the following step to apply power to the power converter.

Move the circuit breaker for the AC outlet or the DC control circuit to the on position.

The LED on the power converter front panel is green when the unit is operating normally. The LED is off when the unit is not powered or is not operating normally. After the power is connected, the switch automatically begins the power-on self-test (POST), a series of tests that verifies that the switch functions properly.

Installing the Switch

This section describes how to install or remove the switch.

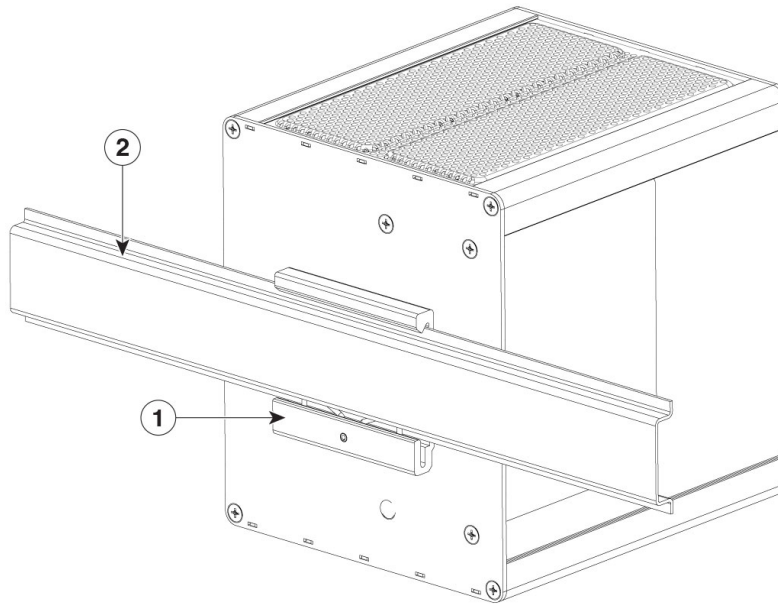
Install the Switch on a DIN Rail

To install the Cisco Catalyst IE3100 Rugged Series Switch, complete the following steps.



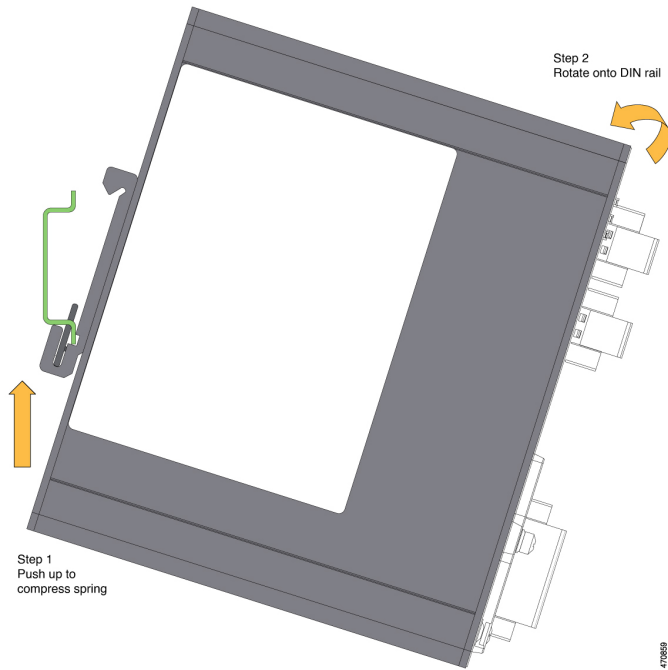
Note In order to prevent excessive side to side movement of the unit, it is advised to install DIN rail stop plates such as Mouser part Numbers 653-PFP-M, 651-1201662 or 845-CA402. These stop plates can be installed on one or both sides of the unit to limit excessive side to side movement that typically occurs in high vibration environments.

Figure 24: Bracket Attached to the DIN Rail

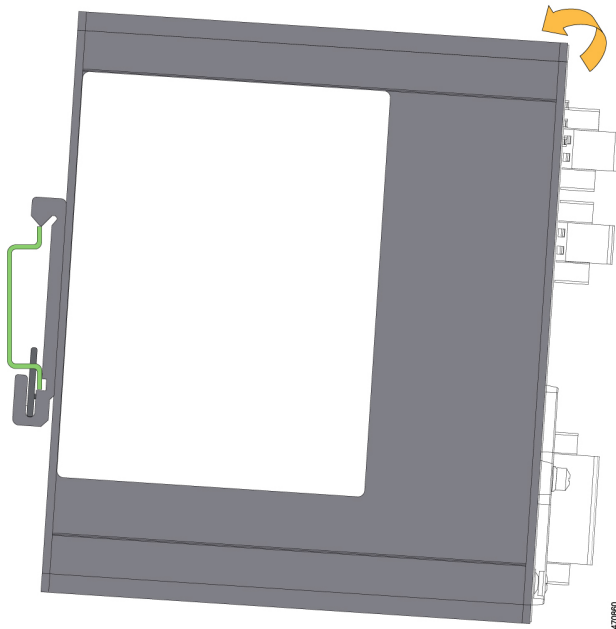


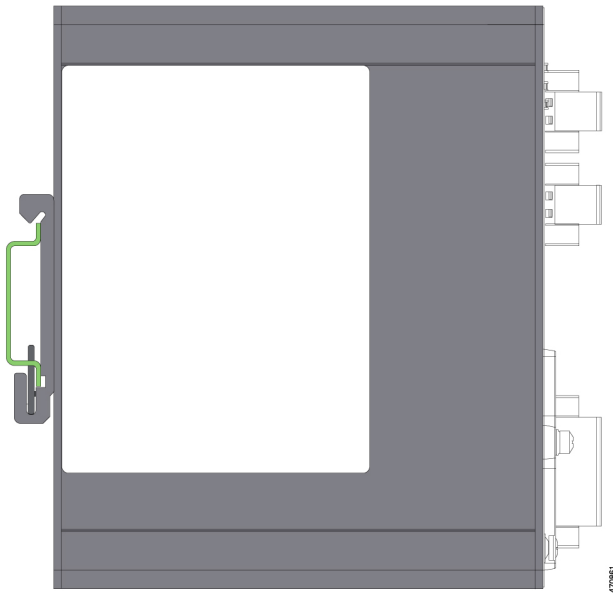
1	DIN rail bracket
2	DIN rail

- Step 1**
- Position the switch so that the lower edge and spring of the DIN clip, which is located within the bottom of the DIN rail bracket, engages with the bottom section of the DIN rail.
 - Push up to compress the spring.



Step 2 Rotate the switch so that the top hook of the DIN clip clamps to the top section of DIN rail. Refer to the following figures.





What to do next

After the switch is mounted on the DIN rail, connect the power and alarm wires, as described in [Connecting Alarm Circuits](#).

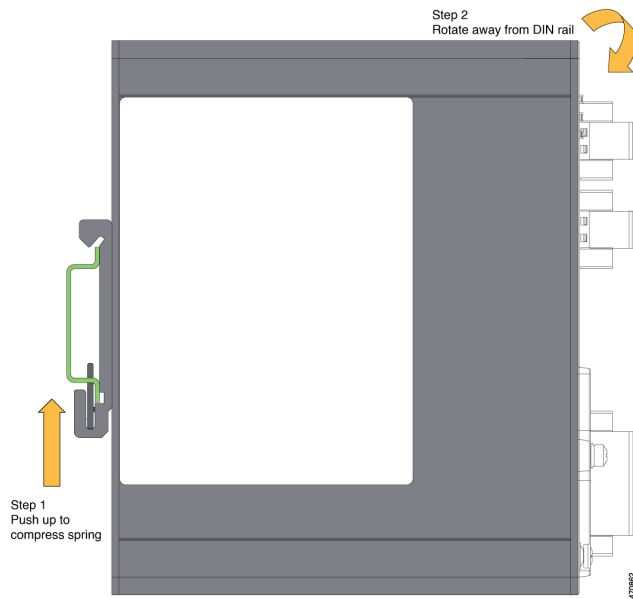
For configuration instructions about the CLI setup program, see [Switch Configuration with the CLI Setup Program, on page 75](#) in this guide.

For instructions on how to remove the switch from a DIN rail, see [Removing the Switch from a DIN Rail](#),

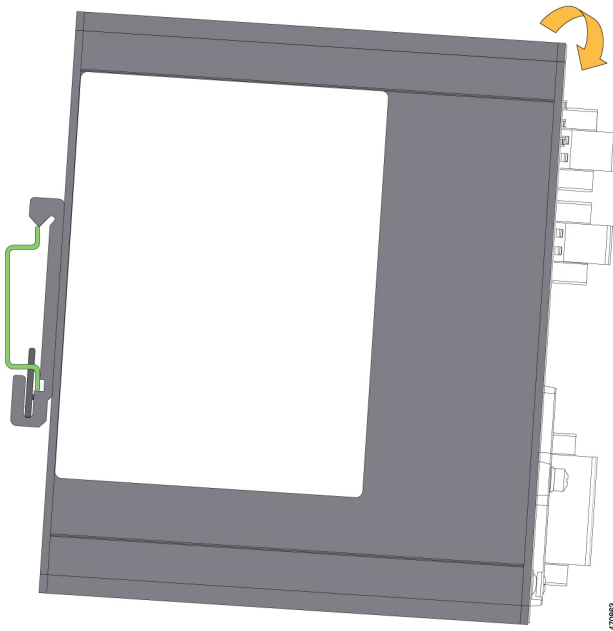
Remove the Switch from a DIN Rail

To remove the Cisco Catalyst IE3100 Rugged Series Switch with the bracket from the DIN rail, complete the following steps.

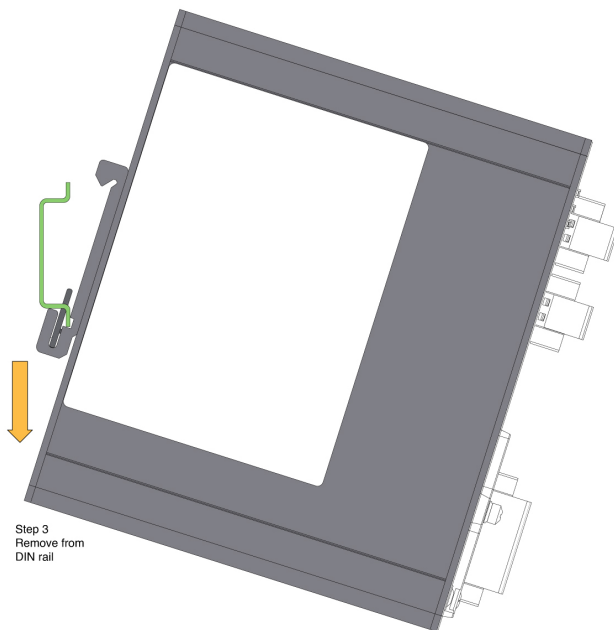
Step 1 Press up on the switch to compress the spring in the DIN rail clip.



- Step 2** Grasp the upper part of the switch and rotate it away from the DIN rail. Refer to the following figure.



- Step 3** Lower the switch away from the DIN rail and remove it. Refer to the following figure.



Connecting Alarm Circuits

After the switch is installed, you are ready to connect the DC power and alarm connections.

Wiring the Protective Ground and DC Power for Alarm Circuits

For instructions on grounding the switch and connecting the DC power, see [Ground the Switch](#), on page 26.

Wire the External Alarms

The switch has two alarm input and one alarm output relay circuits for external alarms. The alarm input circuits are designed to sense if the alarm input is open or closed relative to the alarm input reference pin. Each alarm input can be configured as an open or closed contact. The alarm output relay circuit has a normally open and a normally closed contact.

Alarm signals are connected to the switch through the six-pin alarm connector. Three connections are dedicated to the two alarm input circuits: alarm input 1, alarm input 2, and a reference ground. An alarm input and the reference ground wiring connection are required to complete a single alarm input circuit. The three remaining connections are for the alarm output circuit: a normally open output, a normally closed output, and a common signal. An alarm output and the common wiring connection are required to complete a single alarm output circuit.

The following table shows the labels for the alarm connector that are on the switch panel.

Table 9: Alarm Connector Labels (Top to Bottom)

Label	Connection
NO	Alarm Output Normally Open (NO) connection

Label	Connection
COM	Alarm Output Common connection
NC	Alarm Output Normally Closed (NC) connection
IN2	Alarm Input 2
REF	Alarm Input Reference Ground connection
IN1	Alarm Input 1



Warning Explosion Hazard—Do not connect or disconnect wiring while the field-side power is on; an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or that the area is nonhazardous before proceeding. Statement 1081

Avertissement :

Risque d'explosion : ne connectez pas et ne déconnectez pas le câblage lorsque l'alimentation côté site est sous tension; un arc électrique peut se produire. Cela risque d'entraîner une explosion dans les installations situées dans des zones dangereuses. Avant de poursuivre, assurez-vous que l'alimentation est coupée ou que cette zone est sécurisée. Énoncé 1081



Caution The input voltage source of the alarm output relay circuit must be an isolated source and limited to less than or equal to 30 VDC, 1.0 A and 60 VDC, 0.5 A.

Attention :

La source de tension d'entrée du circuit de relais de sortie d'alarme doit être une source isolée et limitée à moins de 30VCC, 1,0 A, et 60 VCC, 0,5 A.



Note Wire connections to the power and alarm connectors must be UL- and CSA-rated, style 1007 or 1569 twisted-pair copper appliance wiring material (AWM) wire (such as Belden part number 9318).

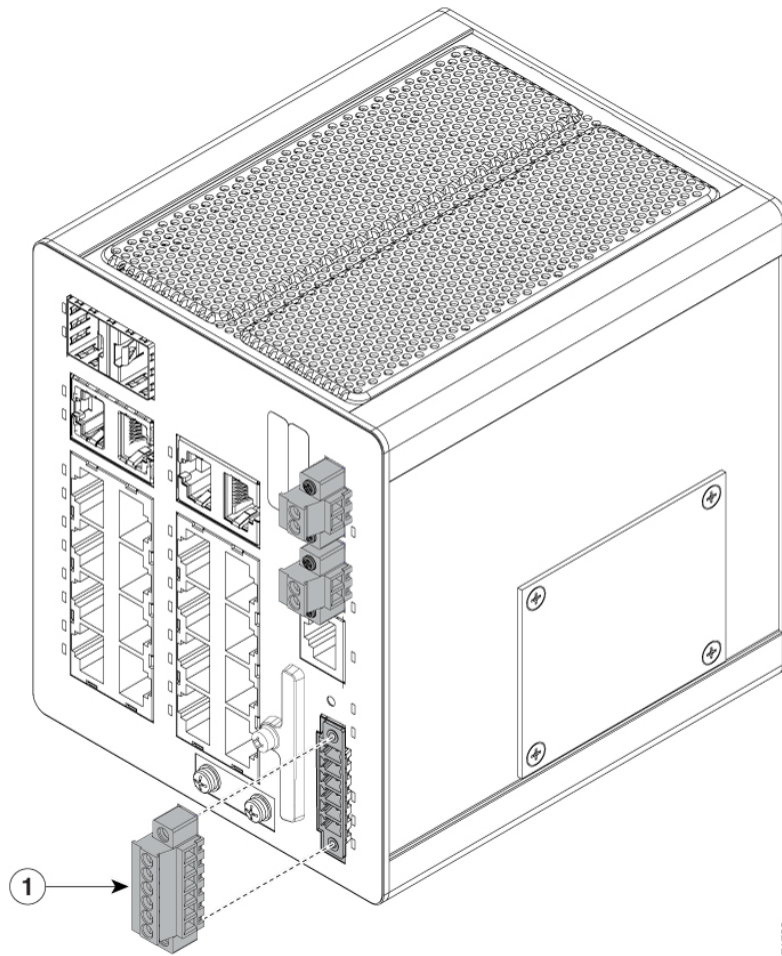
Complete the following steps to wire the external alarms.

Before you begin

Read the following content before wiring the external alarms.

Step 1 Remove the captive screws that hold the alarm connector on the switch, and remove the connector from the switch chassis.

Figure 25: Removing the Alarm Connector

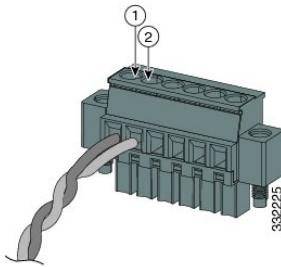


477783

1	Alarm connector
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- Step 2** Measure two strands of twisted-pair wire (18-to-20 AWG) long enough to connect to the external alarm device. You can choose between setting up an external alarm input or output circuit.
- Step 3** Use a wire stripper to remove the casing from both ends of each wire to 0.25 inch (6.3 mm) ± 0.02 inch (0.5 mm). Do not strip more than 0.27 inch (6.8 mm) of insulation from the wires. Stripping more than the recommended amount of wire can leave exposed wire from the alarm connector after installation.
- Step 4** Insert the exposed wires for the external alarm device into the connections based on an alarm input or output circuit setup. Refer to the table earlier in this section. For example, to wire an alarm input circuit, complete the IN1 and REF connections.

Figure 26: Inserting Wires into the Alarm Connector (Alarm Input Circuit)

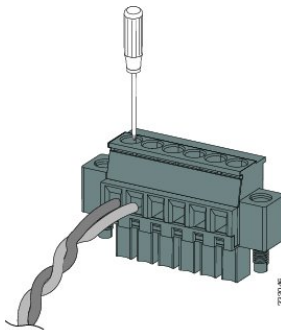


1	IN1 - External device connection 1	2	REF - External device connection 2
---	------------------------------------	---	------------------------------------

Step 5 Use a ratcheting torque flathead screwdriver to tighten the alarm connector captive screw (above the installed wire leads) to 2 in-lb (0.23 N-m), as shown in the following illustration.

Note Do not over-torque the power and alarm connectors' captive screws. Do not exceed 2 inch-lbs (0.23 N-m) torque.

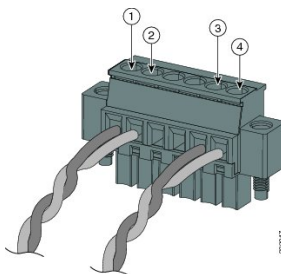
Figure 27: Securing the Alarm Connector Captive Screws



Step 6 Repeat the preceding steps to insert the input and output wires of another external alarm device into the alarm connector.

The following illustration shows the completed wiring for two external alarm devices. The first alarm device circuit is wired as an alarm input circuit; the IN1 and REF connections complete the circuit. The second alarm device circuit is wired as an alarm output circuit that works on a normally open contact basis; the NO and COM connections complete the circuit.

Figure 28: Completed Connections for Three External Alarm Devices on the Alarm Connector



1	IN1 wired connection	3	COM wired connection
---	----------------------	---	----------------------

2	REF wired connection	4	NO wired connection
---	----------------------	---	---------------------

Attach the Alarm Connector to the Switch

To attach the alarm connector to the front panel of the switch, complete the following steps.



Warning Failure to securely tighten the captive screws can result in an electrical arc if the connector is accidentally removed. Statement 397

Avertissement :

Ne pas serrer correctement les vis imperdables peut produire un arc électrique si le connecteur est accidentellement retiré. Énoncé 397



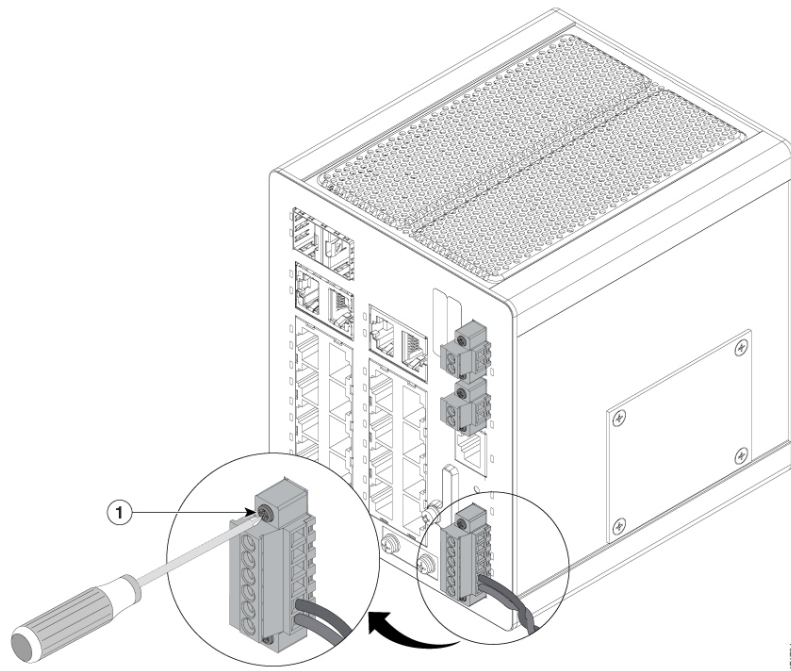
Warning When you connect or disconnect the power and/or alarm connector with power applied, an electrical arc can occur. This could cause an explosion in hazardous area installations. Be sure that all power is removed from the switch and any other circuits. Be sure that power cannot be accidentally turned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

Avertissement :

Si vous branchez ou débranchez le connecteur d'alimentation ou d'alarme, un arc électrique risque de se produire. Cela risque d'entraîner une explosion dans les installations situées dans des environnements dangereux. Assurez-vous que le commutateur et tous les autres circuits ne sont pas sous tension. Avant de commencer, assurez-vous qu'il est impossible de brancher accidentellement l'alimentation électrique et vérifiez que la zone n'est pas dangereuse. Énoncé 1058

Step 1 Insert the alarm connector into the receptacle on the switch front pane, as shown in the following illustration.

Figure 29: Connecting the Alarm Connector to the Switch



1	Alarm connector upper captive screw
---	-------------------------------------

Step 2 Use a ratcheting torque flathead screwdriver to tighten the captive screws on the sides of the alarm connector.

Connecting Destination Ports

The following sections provide more information about connecting to the destination ports.

Connect to 10/100/1000 Ports

The switch 10/100/1000 ports automatically configure themselves to operate at the speed of attached devices. If the attached ports do not support autonegotiation, you can explicitly set the speed and duplex parameters. Connecting devices that do not autonegotiate or that have their speed and duplex parameters that are manually set can reduce performance or result in no linkage.

**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

Avertissement :

Ne pas brancher ou débrancher les câbles de ports lorsque le commutateur ou un périphérique du réseau est sous tension, car un arc électrique risque de se produire. Cela risque d'entraîner une explosion dans les installations situées dans des zones dangereuses. Avant de poursuivre, assurez-vous que l'alimentation au commutateur est coupée et qu'il est impossible de la brancher accidentellement ou que la zone est sécurisée. Énoncé 1070

To maximize performance, choose one of these methods for configuring the Ethernet ports:

- Let the ports autonegotiate both speed and duplex.
- Set the port speed and duplex parameters on both ends of the connection.

**Danger**

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

**Danger**

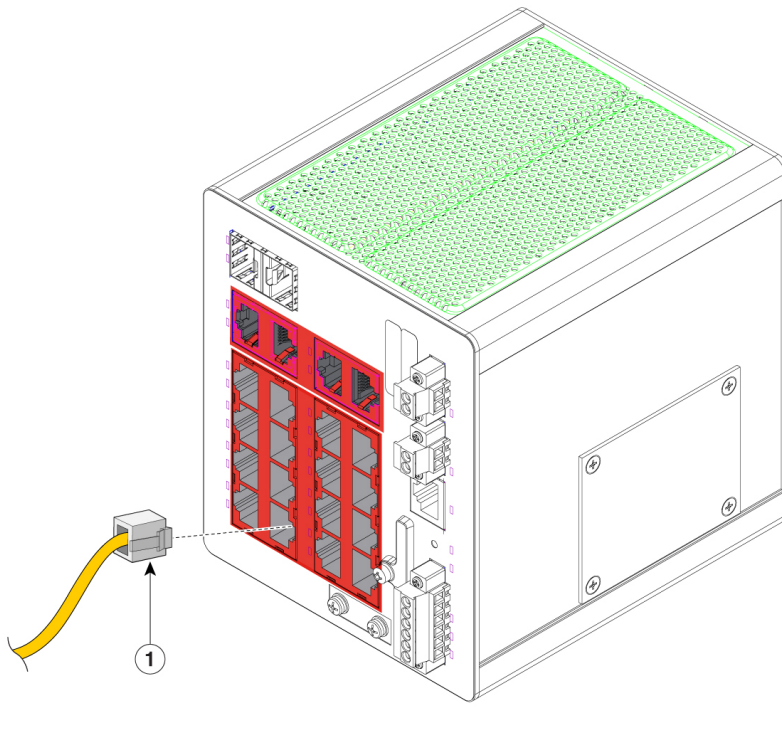
Pour éviter les dommages causés par les décharges électrostatiques (ESD), suivez les procédures standard de manipulation de la carte et des composants.

To connect to 10BASE-T, 100BASE-TX, or 1000BASE-T devices, complete the following steps:

Step 1

When connecting to workstations, servers, routers, and Cisco IP phones, connect a straight-through cable to an RJ-45 connector on the front panel, as shown in the following illustration.

Figure 30: Connecting to an Ethernet Port



1	Ethernet cable
---	----------------

Note You can insert the cable into any of the ports outlined in red in the preceding illustration.

Step 2 Connect the other end of the cable to an RJ-45 connector on the other device.

The port LED turns on when both the switch and the connected device establish the link.

The port LED is amber while Spanning Tree Protocol (STP) discovers the topology and searches for loops. This can take up to 30 seconds, and then the port LED turns green. If the port LED does not turn on:

- The device at the other end might not be turned on.
- There might be a cable problem or a problem with the adapter that is installed in the attached device. For solutions to cabling problems, see the chapter Troubleshooting in this guide.

Step 3 Reconfigure and reboot the connected device if necessary.

Step 4 Repeat Steps 1 through 3 to connect each device.

Installing and Removing 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.



Caution When you use commercial SFP modules such as CWDM and 1000BX-U/D, reduce the maximum operating temperature by 59°F (15°C). The minimum operating temperature is 32°F (0°C).

Attention :

Lorsque vous utilisez des modules SFP commerciaux comme CWDM et 1000BX-U/D, réduisez la température de fonctionnement maximale de 15 °C (59 °F). La température minimale de fonctionnement est de 0 °C (32 °F).



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

Attention :

Pour éviter les dommages causés par les décharges électrostatiques (ESD), suivez les procédures standard de manipulation de la carte et des composants.



Note The following warning applies only to installation in hazardous locations.



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

Avertissement :

N'insérez pas et ne retirez pas les modules SFP lorsque l'appareil est sous tension; un arc électrique peut se produire. Cela risque d'entraîner une explosion dans les installations situées dans des zones dangereuses. Avant de poursuivre, assurez-vous que l'alimentation est coupée ou que la zone est sécurisée. Énoncé 1087

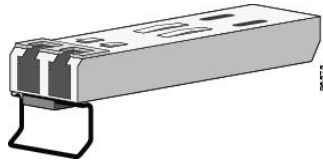
Install LC SFP Modules

Complete the following steps to insert an LC SFP module into the SFP module slot.



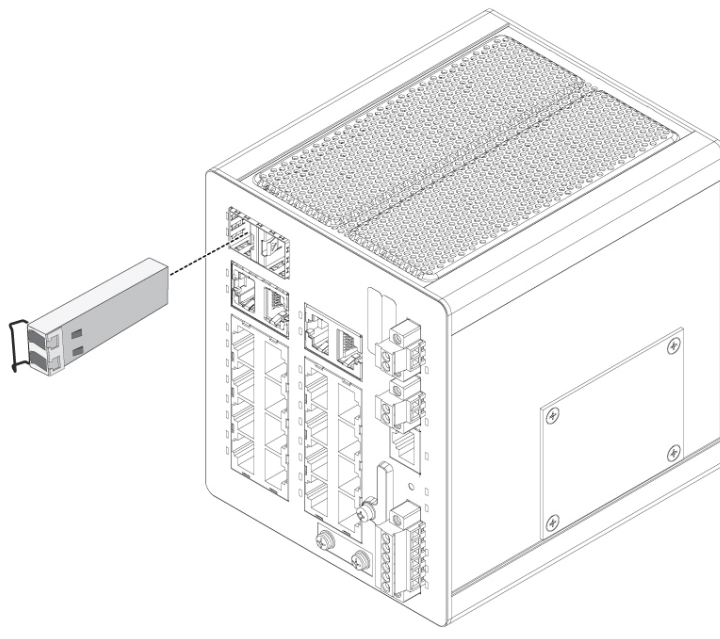
Note Do not install or remove the LC SFP module with fiber-optic cables attached because of potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module. Removing and installing an SFP module can shorten its useful life. Do not remove and insert SFP modules more often than is absolutely necessary.

Figure 31: LC SFP Module with Open Bale-Clasp Latch



- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a grounded bare metal surface.
- Step 2** Find the send (TX) and receive (RX) markings that identify the correct side of the SFP module.
- 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).
- Step 3** Align the SFP module sideways in front of the slot opening.
- Step 4** Insert the SFP module into the slot until the connector on the module snaps into place in the rear of the slot, as shown in the following illustration.

Figure 32: Installing an SFP Module into an SFP Module Slot



Note You can insert the SFP module into either of the two ports outlined in red in the preceding illustration.

- Step 5** Remove the dust plugs from the SFP module optical ports and store them for later use.

Caution Do not remove the dust 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.

Attention :

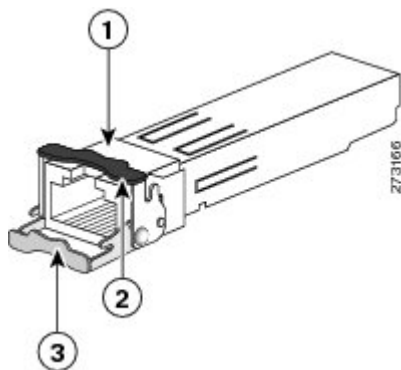
Ne retirez pas les bouchons antipoussière du port du module SFP ni les capuchons en caoutchouc du câble à fibre optique avant d'être prêt à connecter le câble. Les bouchons et capuchons protègent les ports et les câbles du module SPF contre la contamination et la lumière ambiante.

Step 6 Insert the LC cable connector into the SFP module.

Install 1000BASE-T SFP Modules

The 1000BASE-T (copper) SFP transceiver, as shown in the following illustration, has a bale-clasp locking mechanism that secures the transceiver in the module socket. An RJ-45 connector provides the transceiver's interface point to the network.

Figure 33: 1000BASE-T SFP Transceiver



1	RJ-45 connector	3	Open bale-clasp latch (unlocked)
2	Closed bale-clasp latch mechanism (locked)		



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

Attention :

Aux fins de conformité avec les exigences GR-1089 en matière de protection contre la foudre à l'intérieur des bâtiments, vous devez utiliser un câble à paires torsadées blindé et mis à la terre de catégorie 5.

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

Complete the following steps to install a 1000BASE-T SFP transceiver.

Step 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.

Attention :

Pour éviter les dommages causés par les décharges électrostatiques (ESD), manipulez le module SFP par ses côtés; ne touchez pas les broches du connecteur.

Step 2 Remove the new 1000BASE-T SFP module from its protective packaging.

Step 3 Check the markings on the SFP transceiver to verify that you have the correct model for your network.

Step 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 the SFP transceiver is oriented correctly when you position it in front of the port socket.

Step 5 With the bale-clasp closed (locked), slide the SFP transceiver into the socket until you feel it snap in place in the socket.

Refer to the illustration Installing an SFP Module into an SFP Module Slot in the section Installing LC SFP Modules. You may hear an audible click as the SFP transceiver latch engages in the socket.

Step 6 Connect the network interface cable RJ-45 plug to the SFP RJ-45 connector.

Step 7 Observe the port status LED:

LED State	Description
Green	The SFP transceiver and the target device established a link.
Amber	The port is discovering the network topology and searching for loops. This process takes about 30 seconds, and then the LED turns green.
Off	The target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter that is installed in the target device. Refer to the chapter Troubleshooting in this guide.

Remove SFP Modules from SFP Module Slots

Complete the following steps to remove an SFP module from a module receptacle.

Step 1 Attach an ESD-preventive wrist strap to your wrist and to a grounded bare metal surface.

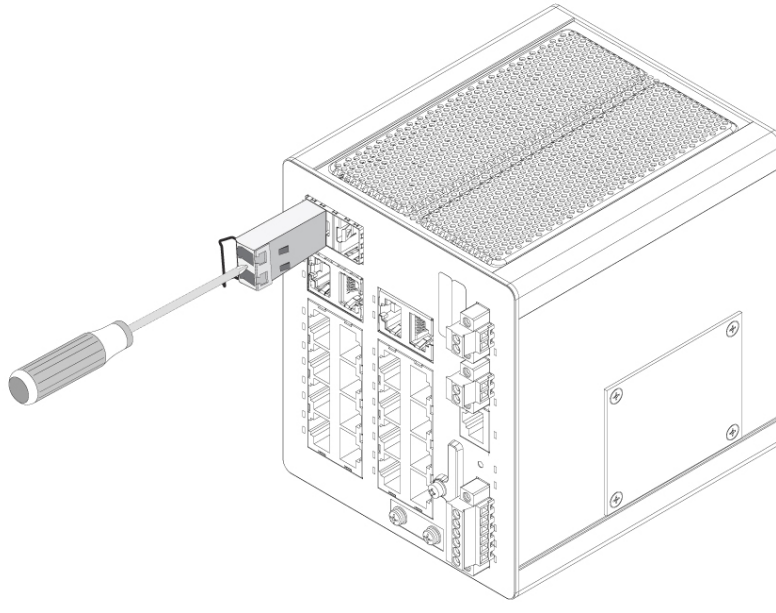
Step 2 Disconnect the LC from the SFP module.

Step 3 Insert a dust plug into the optical ports of the SFP module to keep the optical interfaces clean.

Step 4 Unlock and remove the SFP module.

If the module has a bale-clasp latch, pull the bale out and down to eject the module. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or other long, narrow instrument to open the bale-clasp latch, as shown in the following illustration.

Figure 34: Opening a Bale-Clasp Latch on an SFP Module



Step 5 Grasp the SFP module between your thumb and index finger, and carefully remove it from the module slot.

Step 6 Place the removed SFP module in an antistatic bag or other protective environment.

Connecting to SFP Modules

This section describes how to connect to a fiber-optic or copper SFP port.



Warning Class 1 laser product. Statement 1008

Avertissement :

Produit laser de classe 1. Énoncé 1008



Note The following warning applies only to installation in hazardous locations.

**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

Avertissement :

Ne pas brancher ou débrancher les câbles de ports lorsque le commutateur ou un périphérique du réseau est sous tension, car un arc électrique risque de se produire. Cela risque d'entraîner une explosion dans les installations situées dans des zones dangereuses. Avant de poursuivre, assurez-vous que l'alimentation au commutateur est coupée et qu'il est impossible de la brancher accidentellement ou que la zone est sécurisée. Énoncé 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.

Attention :

Ne retirez pas les capuchons en caoutchouc du port du module SFP ni du câble à fibre optique avant d'être prêt à connecter le câble. Les bouchons et capuchons protègent les ports et les câbles du module SPF contre la contamination et la lumière ambiante.

**Caution**

Before connecting to the SFP module, be sure that you understand the port and cabling guidelines in Preparing for Installation. See the chapter Cable and Connectors for information about the LC on the SFP module.

Attention :

Avant de vous connecter au module SFP, assurez-vous de bien comprendre les instructions relatives au port et au câblage dans la section Préparation de l'installation. Reportez-vous au chapitre Câbles et connecteurs pour plus d'informations sur le connecteur LC sur le module SFP.

**Caution**

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

Attention :

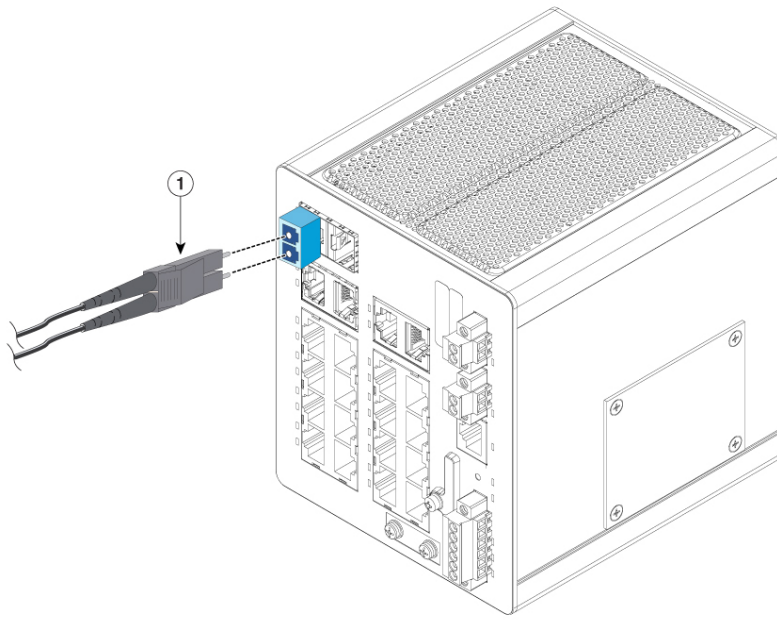
Pour éviter les dommages causés par les décharges électrostatiques (ESD), suivez les procédures standard de manipulation de la carte et des composants.

Connect to a Fiber Optic SFP Module

To connect a fiber-optic cable to an SFP module, complete the following steps:

-
- Step 1** Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.
- Step 2** Insert one end of the fiber-optic cable into the SFP module port, as shown in the following illustration.

Figure 35: Connecting to a Fiber-Optic SFP Module Port



1	LC connector
---	--------------

Step 3 Insert the other cable end into a fiber-optic receptacle on a target device.

Step 4 Observe the port status LED:

LED State	Description
Green	The switch and the target device have an established link.
Amber	The STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
Off	The target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter that is installed in the target device. See the Troubleshooting chapter in this guide for solutions to cabling problems.

Step 5 If necessary, reconfigure and restart the switch or the target device.

Connect to a 1000BASE-T SFP Module

Complete the following steps to connect a CAT5 cable to a 1000BASE-T SFP module:

Step 1 Insert a cable into the RJ-45 connector:

If you are connecting to...	Then insert...
Servers, workstations, and routers	A four twisted-pair, straight-through cable

If you are connecting to...	Then insert...
Switches or repeaters	A four twisted-pair, crossover cable
A 1000BASE-T device	A four twisted-pair CAT5 cable

Step 2 Insert the other cable end in an RJ-45 connector on a target device.

Step 3 Observe the port status LED.

LED State	Description
Green	The switch and the target device have an established link.
Amber	The STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
Off	The target device might not be turned on, there might be a cable problem, or there might be problem with the adapter that is installed in the target device. See the chapter Troubleshooting in this guide for solutions to cabling problems.

Step 4 If necessary, reconfigure and restart the switch or target device.

Connect to a Dual-Purpose Port

The dual-purpose port is a single port with two interfaces, one for an RJ-45 cable and another for an SFP module. Only one interface can be active at a time. If both interfaces are connected, the SFP module has priority. For more information about dual-purpose ports, see [Power Connectors, on page 6](#) in this guide.



Warning Class 1 laser product. Statement 1008

Avertissement :

Produit laser de classe 1. Énoncé 1008



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.

Attention :

Ne retirez pas les capuchons en caoutchouc du port du module SFP ni du câble à fibre optique avant d'être prêt à connecter le câble. Les bouchons et capuchons protègent les ports et les câbles du module SPF contre la contamination et la lumière ambiante.

Complete the following steps to connect to a dual-purpose port.

Before you begin



Caution Before connecting to the SFP module, be sure that you understand the port and cabling stipulations in [Preparing for Installation, on page 13](#) in this guide.

Attention :

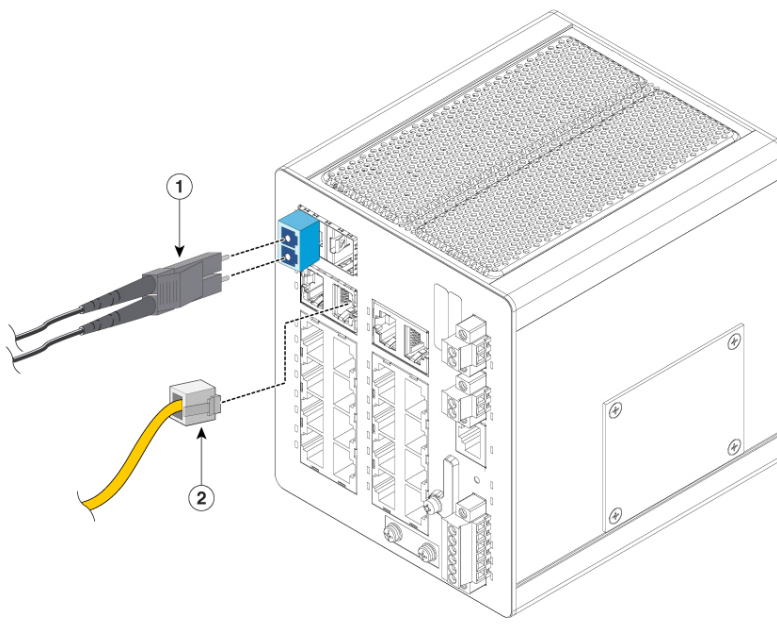
Avant de vous connecter au module SFP, assurez-vous de bien comprendre les instructions relatives au port et au câblage dans la section [Preparing for Installation](#) de ce guide.

Step 1

Connect an RJ-45 connector to the 10/100/1000 port, or install an SFP module into the SFP module slot, and connect a cable to the SFP module port.

The following illustration shows the dual-port connection.

Figure 36: Connecting to a Dual-purpose Port



1	SFP connector	2	RJ-45 connector
---	---------------	---	-----------------

Note You can insert the SFP connector into either of the ports outlined in red in the preceding illustration. You can insert the RJ-45 connector into either of the ports outlined in orange in the preceding illustration.

For more information about RJ-45 connections, SFP modules, and optical connections, see [Connect to 10/100/1000 Ports, on page 49](#), [Installing and Removing SFP Modules, on page 51](#), and [Connecting to SFP Modules, on page 56](#) in this guide.

Step 2 Connect the other end of the cable to the other device.

By default, the switch detects whether an RJ-45 connector or SFP module is connected to a dual-purpose port and configures the port accordingly. You can change this setting and configure the port to recognize only an RJ-45 connector or only an SFP module by using the **media-type** interface configuration command.

Verifying the Switch Operation

Before installing the switch in its final location, power on the switch, and verify that the switch powers up. The purpose is to verify that switch powers up, and that any fiber or copper connections made establish an Ethernet link. This step is optional.

What to Do Next

If the switch has been previously configured and is currently in nondefault state, then the switch does not need further configuration. you can use any of the following management options to change the default configuration:

- Start the Web UI, which is in the switch memory, to manage individual and standalone switches. This is an easy-to-use web interface that offers quick configuration and monitoring. You can access the Web UI from anywhere in your network through a web browser. For more information, see the Software Configuration Guide and the Web UI online help.
- Use the CLI to configure the switch as an individual switch from the console.
- Start an SNMP application.
- Start the Common Industrial Protocol (CIP) management tool. You can manage an entire industrial automation system with the CIP-based tools.



Note If the switch is in default state and needs initial configuration, see the following chapters in this guide: [Express Setup](#) and [Switch Configuration with the CLI Setup Program](#). These chapters can help you with Day 1 configuration.



CHAPTER 3

Cables and Connectors

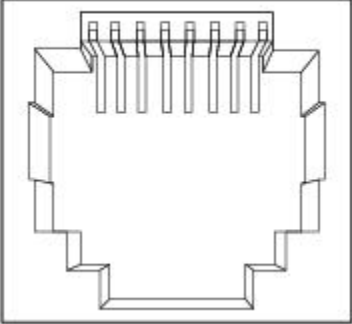
- [Connector Specifications](#), on page 63
- [Cables and Adapters](#), on page 66

Connector Specifications

10/100/1000 Ports

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

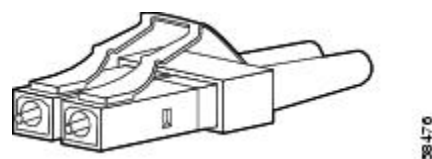
Figure 37: 10/100/1000 Port Pinouts

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

SFP Module Connectors

The following illustration shows a Lucent Connector (LC) style, fiber-optic cable connector.

Figure 38: Fiber-Optic SFP Module LC Connector





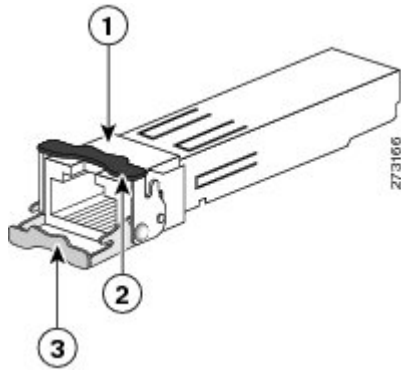
Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

Avertissement :

Les fibres ou les connecteurs déconnectés peuvent émettre des rayonnements laser invisibles. Ne fixez pas les rayons ou ne les regardez pas directement avec des instruments optiques. Énoncé 1051

The following illustration shows the 1000BASE-T SFP module RJ-45 connector.

Figure 39: 1000BASE-T SFP Module Connector

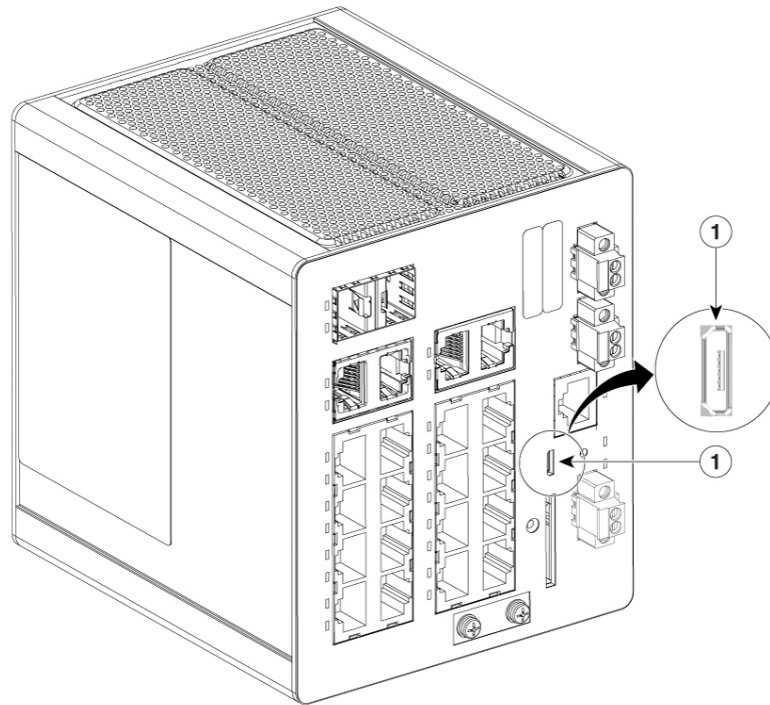


1	RJ-45 connector	3	Bale-clasp latching mechanism in the open (unlocked) position
2	Bale-clasp latching mechanism in the closed		

Console Port

The switch has two console ports: a USB micro-Type B port and an RJ-45 console port, both on the front panel.

Figure 40: Micro USB Type B Port



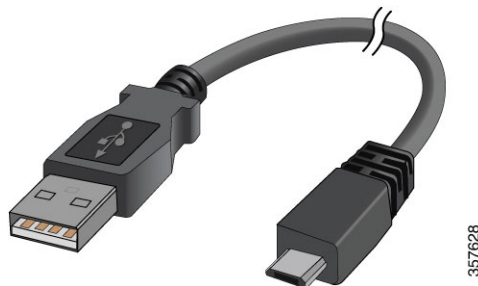
1	USB Micro-Type B Port
---	-----------------------

The USB console port uses a USB Type B to 5-pin micro-Type B cable, which is shown in the following illustration. The USB micro Type A-to-USB micro-Type B cable is not supplied.



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

Figure 41: USB Micro Type B-to-USB 5-Pin Micro-Type B Cable



The RJ-45 console port uses an 8-pin RJ-45 connector. The supplied RJ-45-to-DB-9 adapter cable is used to connect the console port of the switch to a console PC. You must 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.

Alarm Port

The labels for the alarm connector pin-outs are on the switch panel and are displayed in the following table.

Table 10: Alarm Port Labels

Label	Connection
NO	Alarm Output Normally Open (NO) connection
COM	Alarm Output Common connection
NC	Alarm Output Normally Closed (NC) connection
IN2	Alarm Input 2
REF	Alarm Input Reference Ground connection
IN1	Alarm Input 1

Cables and Adapters

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. See the Cisco Catalyst IE3100 Rugged Series Data Sheet on cisco.com for detailed cabling information.



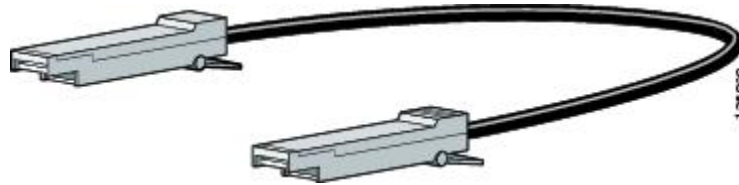
Note

- The maximum operating temperature of the switch varies depending on the type of SFP module that you use.
- Modal bandwidth applies only to multimode fiber (MMD),
- A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers.
- 1000BASE-LX/LH SFP modules connected with MMF over a short link distance require a mode-conditioning patch cord.
 Ordinary patch cords can cause transceiver saturation, resulting in an elevated bit error rate (BER). Using the 1000BASE-LX/LH SFP module with 62.5-micron diameter MMF requires a mode-conditioning patch cord between the single mode fiber (SMF) SFP module and the MMF cable on both the send and receive link ends.
- Link distances greater than 984 feet (300 m) require a mode-conditioning patch cord.
- 1000BASE-ZX SFP modules can send data up to 62 miles (100 km) by using dispersion-shifted SMF or low-attenuation SMF. The distance depends on fiber quality, the number of splices, and the connectors.
 Fiber-optic cable spans less than 15.43 miles (25 km) require a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module.

SFP Module Patch Cable

The switch uses an SFP-module patch cable, a 0.5-meter, copper, passive cable with SFP module connectors at each end, as shown in the following illustration. The patch cable connects two switches in a cascaded configuration.

Figure 42: SFP Module Patch Cable



Cable Pinouts

This section contains information about cable pinouts for different cables that are used with Cisco Catalyst IE3100 Rugged Series Switches.

Figure 43: Two Twisted-Pair Straight-Through Cable Schematic for 10/100 Ports

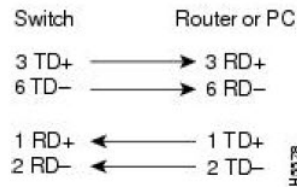


Figure 44: Two Twisted-Pair Crossover Cable Schematic for 10/100 Ports

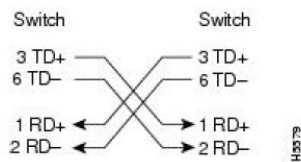


Figure 45: Four Twisted-Pair Straight-Through Cable Schematic for 1000BASE-T Ports

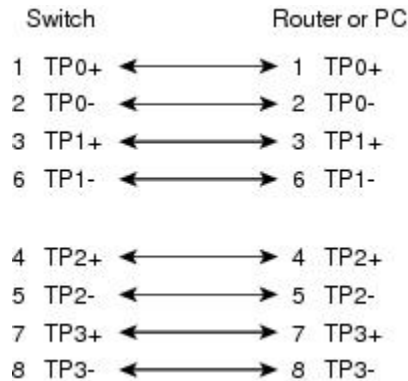
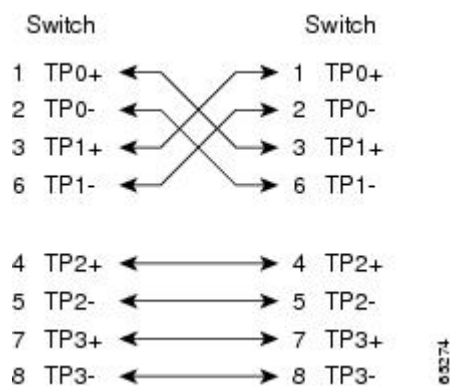
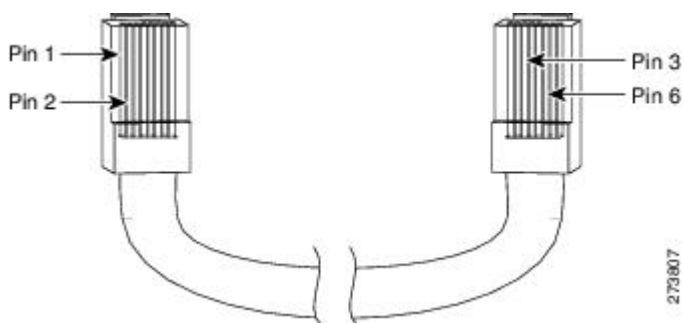


Figure 46: Four Twisted-Pair Crossover Cable Schematics for 1000BASE-T Ports



To identify a crossover cable, hold the cable ends side by side, with the tab at the back. The wire connected to pin 1 on the left end should be the same color as the wire connected to pin 3 on the right end. The wire connected to pin 2 on the left end should be the same color as the wire connected to pin 6 on the right end.

Figure 47: Identifying a Crossover Cable



Console Port Adapter Pinouts

The console port uses an 8-pin RJ-45 connector. If you did not order a console cable, you must provide an RJ-45-to-DB-9 adapter cable to connect the switch console port to a PC console port. If you want to connect the switch console port to a terminal, you must provide an RJ-45-to-DB-25 female DTE adapter.

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

Table 11: Console Port Signaling Using a DB-9 Adapter

Switch ConsolePort (DTE)	RJ-45-to-DB-9Terminal Adapter	ConsoleDevice
Signal	DB-9 Pin	Signal
RTS	8	CTS
DTR	6	DSR
TxD	2	RxD
GND	5	GND

Switch Console Port (DTE)	RJ-45-to-DB-9 Terminal Adapter	Console Device
RxD	3	TxD
DSR	4	DTR
CTS	7	RTS

The following table lists the pinouts for the switch console port, RJ-45-to-DB-25 female DTE adapter, and the console device.

Table 12: Console Port Signaling Using a DB-25 Adapter

Switch Console Port (DTE)	RJ-45-to-DB-25 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 4

Express Setup

- [Express Setup, on page 71](#)
- [Required Equipment, on page 71](#)
- [Run Express Setup, on page 72](#)

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 running Windows or a Mac.
- A web browser with JavaScript enabled.
Google Chrome 38 or later, Mozilla Firefox 35 or later, or Apple Safari 7 or later.
- A straight-through Category 5 Ethernet cable to connect your computer to the switch port.



Note Do not use the RS-232 serial console port for Express Setup.

- A small paper clip to reach the 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.

Run Express Setup

Complete the steps in this section to use Express Setup to enter the initial IP information.

Before you begin

Perform the following checks before you use Express Setup.

- Make sure that the switch is in default factory mode.
- Make sure that nothing is connected to the switch.

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



Note Exception: You can add a serial console cable to monitor the booting sequence. *Do not hit [return key] on the console screen.* Make sure that the computer that is connected to the switch is configured with DHCP.

Step 1 Complete one of the following actions:

If the switch...	Then...
Is fresh out of the box	Go to the next step.
Is not fresh out of the box	Use a paper clip to reset the switch for 15 seconds until the System LED turns red, then release the paper clip. The switch automatically reboots once the System LED goes red.

Step 2 On the computer that is connected to the switch, disable web browser pop-up blockers and proxy settings.

Step 3 Connect power to the switch.

Step 4 See the wiring instructions in the sections [Ground the Switch, on page 26](#) and [Wire the DC Power Source, on page 32](#) in this guide.

Step 5 Power on or reset the switch.

Use LEDs to monitor boot progress:

- Blinking System LED: bootloader
- Off System LED: POST
- Solid Green System LED: POST exit, initializing IOS
- Green System and Alarm LEDs green: IOS initialization done
- Blinking Express Setup LED: Ready for express setup process

Step 6 Insert a paper clip into Express Setup button for 1 to 2 seconds.

Step 7 Connect the computer to port Gi1/3.

The LED continues to blink.

Step 8 After the computer has the IP Address 192.168.1.1, point the browser to <http://192.168.1.254>.

Step 9 Enter the username and password.

The username is admin, and the password is the system serial number.

The **Account Settings** window appears.

Step 10 In the **Account Settings** window, complete the following tasks:

a) Fill out the fields in the **Account Settings** window as follows:

- *Login Name*: admin
You can change the login name here, if you like.
- *Login User Password*: By default, the login user password is the serial number of the switch.
You can change the login user password here if you like.
- *Confirm Login User Password*: Retype the password that you used earlier.
- *Command-Line Password* (Optional): This defaults to Sync to Login Password.
You can change the command login password here by using the drop-down list.
- *Device Name*: Create an identifier for the device in the network.
- *NTP Server* (Optional): You may identify an NTP server for the device here.
- *Date & Time Mode* (Optional): Identify the mode here, through the drop-down.

Trouble If the account settings window does not appear, make sure that any pop-up blockers or proxy settings on your browser are disabled. Also make sure that any wireless client is disabled on your computer.

b) After you finish filling in the fields in the **Account Settings** window, click **Basic Settings**.

Step 11 In the **Basic Settings** window, complete the following tasks:

a) Fill out the fields as follows, using English letters and Arabic numbers:

- *IP Address*: Choose Static or DHCP.
- *VLAN ID*: Enter a valid VLAN ID.
This is the management VLAN for the switch.
- *IP Address*: Enter a valid IP Address.
- *Subnet Mask*: Enter a valid subnet mask.
- *Default Gateway*: Enter the IP address of the router (not optional if IP is static).

You must enter the router IP address if the IP address is static.

(Optional) On this screen you can also enable or disable Telnet and SSH and configure CIP settings.

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. 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.

For more information about the CIP VLAN settings, click Help on the toolbar.

- b) After you finish filling in the fields in the **Basic Settings** window, click **Switch Wide Settings**.

Step 12

In the **Switch Wide Settings** window, complete the following tasks:

- a) Fill out the fields as follows:

- *Data VLAN*: You can enable or disable the data VLAN with the button here.
- *Voice VLAN*: You can enable/disable Voice VLAN here.
- *STP Mode* (Optional): Select an STP Mode from the drop-down
- *Bridge Priority*: You can update, enable, or disable Bridge Priority here.
- *Domain Name* (Optional): Enter a valid Domain Name.

- b) After you finish filling in the fields in the **Switch Wide Settings** window, click **Day 0 Config Summary**.

The **Summary** window displays the configuration settings that you made.

Step 13

In the **Summary** window, confirm that the settings are accurate and complete one of the following actions:

If the settings...	Then...
Are correct	Click Submit to complete the initial setup.
Are not correct	<p>a. Click the back button and make the required changes.</p> <p>b. Navigate back to the Summary window.</p> <p>c. Click Submit to complete the initial setup.</p>

After you click **Submit**, the following events occur:

- a. The switch is configured and exits Express Setup mode.
- b. The browser displays a warning message and tries to connect with the earlier switch IP address.
- c. Success dialogue appears. Click **OK**.

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.

Step 15

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



CHAPTER 5

Switch Configuration with the CLI Setup Program

This chapter provides a command-line interface (CLI)-based setup procedure for a switch.

For information about setting up the switch by using Express Setup, see the chapter [Express Setup, on page 71](#) in this guide.

Before connecting the switch to a power source, review the installation [Warnings, on page 13](#) section in this guide. For installation procedures, see the chapter [Switch Installation, on page 13](#) in this guide.

- [Accessing the CLI Through the Console Port, on page 75](#)
- [Entering the Initial Configuration Information, on page 78](#)

Accessing the CLI Through the Console Port

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

- [Accessing the CLI through the RJ-45 Console Port, on page 75](#)
- [Accessing the CLI through the USB Micro-Type B Console Port, on page 76](#)

Accessing the CLI through the RJ-45 Console Port

Complete the following steps to access the CLI through the RJ-45 console port.

-
- Step 1** Connect the RJ-45-to-DB-9 adapter cable to the 9-pin serial port on the PC, and then 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.
- 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 the section [Connecting to Power, on page 25](#) in this guide.

The PC or terminal displays the bootloader sequence.

Step 5 Press **Enter** to display the setup prompt.

Step 6 Follow the steps in the section [Completing the Setup Program](#).

Accessing the CLI through the USB Micro-Type B Console Port

Complete the following steps to access the CLI through the USB Micro Type B console port.

Before you begin

Complete the following steps: If you are connecting the switch USB micro Type B console port to a Windows-based PC for the first time, install a USB driver.

- If you are connecting the switch USB-mini console port to a Windows-based PC for the first time, install a USB driver.
 - Use a Phillips screwdriver to loosen the captive screw on the cover that is shared by the USB micro type B console port and the SD card slot. Then remove the cover.
-

Step 1 Connect a USB cable to the PC USB port, and connect the other end of the cable to the switch micro-B USB console port.

The port is shown in the following illustration.

Figure 48: USB Micro-Type B Port

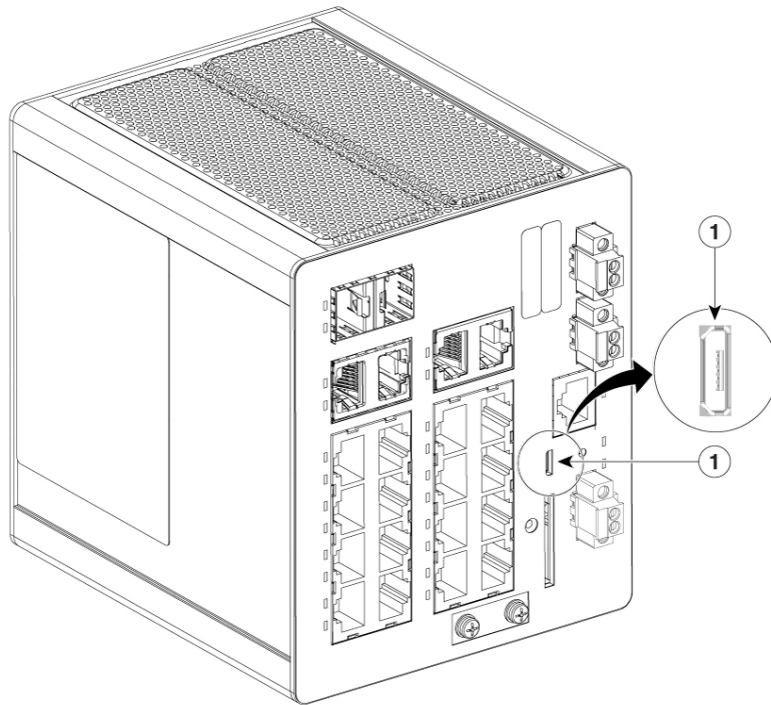


Table 13:

1	USB micro type B console port
---	-------------------------------

Step 2 Identify the COM port that is assigned to the USB console port:

- a) Choose **Start > Control Panel > Systems**.
- b) Click the **Hardware** tab and then choose **Device Manager**.
- c) Expand **Ports**.

The assigned COM port appears in parenthesis at the end of the line with this entry: Cisco USB System Management Console.

Step 3 Start the terminal-emulation program on the PC or the terminal.

The program, frequently a PC application such as HyperTerminal, ProcommPlus, or PuTTY, makes communication possible between the switch and your PC or terminal.

Step 4 Configure the COM port.

Step 5 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 6 Connect power to the switch as described in [Wire the DC Power Source, on page 32](#).

The PC or terminal displays the bootloader sequence.

Step 7 Press Enter to display the setup prompt.

Step 8 Complete the setup by following the steps in the section [Completing the Setup Program](#).

Entering the Initial Configuration Information

To set up the switch, you must complete the setup program, which runs automatically after the switch is powered on. You must assign an IP address and other configuration information necessary for the switch to communicate with the local routers and the Internet. This information is also required if you plan to use Web UI to configure and manage the switch.

IP Settings

Get the following information from your network administrator before you complete the setup program:

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

Complete the Setup Program

Complete the following steps to complete the setup using the CLI.



Note This procedure resumes after the final step in [Accessing the CLI through the RJ-45 Console Port, on page 75](#) or [Accessing the CLI through the USB Micro-Type B Console Port, on page 76](#).

Step 1 At the setup prompt, enter **Yes** at the prompt, as shown in the following example:

Example:

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

Step 2 Enter the host name, as shown in the following example:

Example:

Configuring global parameters:

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

Step 3 Enter an enable secret, as shown in the following example:

Example:

The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.

```
-----
secret should be of minimum 10 characters and maximum 32 characters with
at least 1 upper case, 1 lower case, 1 digit and
should not contain [cisco]
-----
```

```
Enter enable secret: *****
Confirm enable secret: *****
```

Step 4 Enter an enable password, as shown in the following example:

Example:

The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.

```
Enter enable password: *****
```

Step 5 Enter a virtual terminal password, as shown in the following example:

Example:

The virtual terminal password is used to protect access to the router over a network interface.

```
Enter virtual terminal password: *****
```

The system displays a summary of the interfaces:

Current interface summary

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	unset	up	up
GigabitEthernet1/1	unassigned	YES	unset	down	down
GigabitEthernet1/2	unassigned	YES	unset	down	down
GigabitEthernet1/3	unassigned	YES	unset	down	down
GigabitEthernet1/4	unassigned	YES	unset	down	down
GigabitEthernet1/5	unassigned	YES	unset	up	up
GigabitEthernet1/6	unassigned	YES	unset	down	down
GigabitEthernet1/7	unassigned	YES	unset	down	down
GigabitEthernet1/8	unassigned	YES	unset	down	down
GigabitEthernet1/9	unassigned	YES	unset	down	down
GigabitEthernet1/10	unassigned	YES	unset	down	down
GigabitEthernet1/11	unassigned	YES	unset	down	down
GigabitEthernet1/12	unassigned	YES	unset	down	down
GigabitEthernet1/13	unassigned	YES	unset	down	down
GigabitEthernet1/14	unassigned	YES	unset	down	down
GigabitEthernet1/15	unassigned	YES	unset	down	down
GigabitEthernet1/16	unassigned	YES	unset	down	down
GigabitEthernet1/17	unassigned	YES	unset	down	down
GigabitEthernet1/18	unassigned	YES	unset	down	down
GigabitEthernet1/19	unassigned	YES	unset	down	down
GigabitEthernet1/20	unassigned	YES	unset	down	down
AppGigabitEthernet1/1	unassigned	YES	unset	up	up

Step 6 Enter an interface (physical interface or VLAN name) to connect to the management network, as shown in the following example:

Note Vlan 1 is the default interface. It is common to use Vlan 1 interface initially for Day 1, and then change to a different vlan interface later.

Example:

Enter interface name used to connect to the management network from the above interface summary: **Vlan1**

You have now completed the initial configuration of the switch, and the switch displays its initial configuration script:

Configuring interface Vlan1:

The following configuration command script was created:

```
hostname Switch
enable secret 9 $9$HEGVUnAo1ERm7E$jTeFUxq8aQeMFF9zzcRBbdf6R7IuKtTnDbxoarcac
enable password Enable123$
line vty 0 15
password Virtual123$
no snmp-server
!
!
interface Vlan1
no shutdown
no ip address
!
interface GigabitEthernet1/1
!
interface GigabitEthernet1/2
!
interface GigabitEthernet1/3
!
interface GigabitEthernet1/4
!
interface GigabitEthernet1/5
!
interface GigabitEthernet1/6
!
interface GigabitEthernet1/7
!
interface GigabitEthernet1/8
!
interface GigabitEthernet1/9
!
interface GigabitEthernet1/10
!
interface GigabitEthernet1/11
!
interface GigabitEthernet1/12
!
interface GigabitEthernet1/13
!
interface GigabitEthernet1/14
!
interface GigabitEthernet1/15
!
interface GigabitEthernet1/16
!
interface GigabitEthernet1/17
!
interface GigabitEthernet1/18
```

```
!  
interface GigabitEthernet1/19  
!  
interface GigabitEthernet1/20  
!  
interface AppGigabitEthernet1/1  
!  
end
```

Step 7 Depending on whether you want to save the configuration or redo it, enter **0**, **1**, or **2**, as shown in the following example.

Example:

```
[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.
```

What to do next

After you complete the setup program, the switch can run the default configuration that you created. If you want to change this configuration or want to perform other management tasks, you can do so through the CLI.

To use the CLI, enter commands at the `Switch >` prompt through the console port by using a terminal emulation program or through the network by using Telnet. For configuration information, see the switch software configuration guides on cisco.com.



CHAPTER 6

Hazardous Location Installation Information

- [Cisco Catalyst IE3100 Rugged Series Switches in Hazardous Locations, on page 83](#)
- [Hazardous Area Installation Warnings, on page 83](#)
- [North American Hazardous Location Approval, on page 85](#)
- [EMC Environmental Conditions for Products Installed in the European Union, on page 86](#)
- [Hazardous Locations Standards—Normes applicables aux zones dangereuses, on page 86](#)

Cisco Catalyst IE3100 Rugged Series Switches in Hazardous Locations

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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame-spread rating of 5VA. The interior of the enclosure must be accessible only by the use of a tool.

Subsequent sections of this publication might contain additional information about specific enclosure-type ratings that are required to comply with certain product safety certifications.

Hazardous Area Installation Warnings

Read and understand the warnings in this section before installing the switch in a hazardous environment.



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). The operating temperature range is -40 to 140°F (-40 to 60°C).

Avertissement :

Pour éviter toute surchauffe du système, il est recommandé de maintenir une température ambiante inférieure à 60 °C (140 °F). La plage de températures de fonctionnement est de -40 à 60 °C (-40 à 140 °F).



Warning Use a minimum of 18 to 20 AWG (0.8 to 0.5 mm²) twisted-pair supply wires suitable for minimum 104°F (40°C) above surrounding ambient temperature outside the enclosure.

Avertissement :

Utilisez un câble d'alimentation à paires torsadées d'au moins 18 à 20 AWG (0,8 à 0,5 mm²) adapté à une minimum de 40 °C (104 °F) au-dessus de la température ambiante à l'extérieur du boîtier.



Caution When installed in Class I, Division 2, hazardous locations, this equipment should be mounted in a suitable enclosure with proper wiring methods for all power, input, and output wiring that complies with the governing electrical codes and in accordance with the authority having jurisdiction over Class I, Division 2 installations.

Attention :

Lorsqu'il est installé dans des zones dangereuses de classe I, division 2, cet équipement doit être monté dans un boîtier approprié avec des méthodes de câblage appropriées pour tous les câbles d'alimentation, d'entrée et de sortie, qui est conforme aux codes électriques en vigueur et en conformité avec l'autorité compétente pour les installations de classe I, division 2.



Caution The equipment shall only be used in an area of at least pollution degree 2 as defined in EN IEC 60664-1 / EN IEC 60079-0. The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with EN IEC 60079-0 (for ATEX/UK Ex) or UL 60079-0 (for US Zones) and is accessible by a tool only.

Attention :

L'équipement ne doit être utilisé que dans une zone ayant au moins un degré de pollution 2 défini dans les normes IEC 60664-1 et IEC 60079-0. L'équipement doit être installé dans un boîtier offrant un indice de protection minimal de IP54, conformément à la norme IEC 60079-0 (pour ATEX/UK Ex) ou UL 60079-0 (pour les zones américaines), et accessible uniquement à l'aide d'un outil.



Caution This equipment is suitable for use in Class 1, Division 2, Groups A, B, C, D or only in nonhazardous locations.

Attention :

Cet appareil est destiné à une utilisation dans un environnement de Classe 1, Division 2, Groupes A, B, C, D ou uniquement dans des zones non dangereuses.



Caution Airflow around the switch must be unrestricted. To prevent the switch from overheating, there must be a minimum of 1.0 in. (25.4 mm) around all surfaces of the switch. Contact your Cisco Technical Assistance Center (TAC) if tighter spacings are required.

Attention :

Le flux d'air autour du commutateur ne doit pas être bloqué. Pour empêcher le commutateur de surchauffer, il doit y avoir un minimum de 25,4 mm (1,0 po) autour de toutes les surfaces du commutateur. Communiquez avec le Centre d'assistance technique de Cisco (Cisco TAC) si le dégagement est inférieur.



Warning When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method, for all power, input and output wiring, that complies with the governing electrical codes and in accordance with the authority having jurisdiction over Class I, Division 2 installations. Statement 1066

Avertissement :

Lorsqu'il est utilisé dans une zone dangereuse de classe I, division 2, cet équipement doit être monté dans un boîtier approprié avec la méthode de câblage appropriée pour tous les câbles d'alimentation, d'entrée et de sortie, qui est conforme aux codes électriques en vigueur et en conformité avec l'autorité compétente pour les installations de classe I, division 2. Énoncé 1066

North American Hazardous Location Approval

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

<p>English:</p>	<p>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.</p>
<p>Français:</p>	<p>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.</p>

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—Normes applicables aux zones dangereuses

This section provides information about hazardous locations standards for Cisco Catalyst IE3100 Rugged Series Switches.



Note The switches must be installed only in a vertical position.

The following standards were used for the hazardous locations approvals and certifications:

- UL 121201, Ed 9
- CAN/CSA C22.2 No. 60079-0:19, 4th Edition, February 2019
- CAN/CSA C22.2 No. 60079-7:16
- CSA C22.2 No. 213-Ed. 3
- EN IEC 60079-0:2018
- EN 60079-7: 2015+A1:2018
- UL 60079-0, 7th Edition, 2019-03-26
- UL 60079-7, 5th Edition, 2017-02-24
- UL 60079-15, 5th Edition, 2020-04-07
- CAN/CSA C22.2 No. 60079-15:18, November 2018
- EN IEC 60079-15: 2019

The following hazardous locations strings are provided on the Cisco Catalyst IE3X00 Rugged Switch:	Les marques d'homologation suivantes, relatives aux environnements dangereux, sont apposées sur le commutateur robuste Cisco Catalyst IE3X00:
Class 1, Div 2, Groups A B C D	Classe 1, Div 2, Groupes A B C D
Class 1, Zone 2, Ex ec nC IIC T4 Gc X	Classe 1, Zone 2, Ex ec nC IIC T4 Gc X
II 3G, Ex ec nC IIC T4 Gc	II 3G, Ex ec nC IIC T4 Gc
DEMKO UL 23 ATEX 2943X UL23UKEX2764X	DEMKO UL 23 ATEX 2943X UL23UKEX2764X
Class 1, Zone 2, AEx ec nC IIC T4Gc X	Classe 1, Zone 2, AEx ec nC IIC T4Gc X
The following hazardous locations strings are provided on the Cisco Catalyst IEM3X00 Rugged Series Expansion Modules:	Les marques d'homologation suivantes, relatives aux environnements dangereux, sont apposées sur les Modules d'extension robustes Cisco Catalyst IEM3X00
Class 1, Div 2, Groups A B C D	Classe 1, Div 2, Groupes A B C D
Class 1, Zone 2, Ex ec nC IIC T4 Gc X	Classe 1, Zone 2, Ex ec nC IIC T4 Gc X
II 3 G, Ex ec nC IIC T4 Gc	II 3G, Ex ec nC IIC T4 Gc
DEMKO UL 23 ATEX 2943X UL23UKEX2764X	DEMKO UL 23 ATEX 2943X UL23UKEX2764X
Class 1, Zone 2, AEx ec nC IIC T4Gc X	Classe 1, Zone 2, AEx ec nC IIC T4Gc X



CHAPTER 7

Technical Specifications

The most current technical specifications for the Cisco Catalyst IE3100 Rugged Series Switches can be found in the Cisco Catalyst IE3100 Rugged Series Switch Data Sheet. You can find other specs and detail that are not in the Data Sheet in this section.

- [Physical Specifications, on page 89](#)
- [Environmental Ranges, on page 90](#)
- [Alarm Ratings, on page 90](#)
- [Power Input Ratings, on page 91](#)
- [Installation Guidelines for Utility, Railway, and Marine Environments, on page 91](#)

Physical Specifications

The following table lists the physical specifications for Cisco Catalyst IE3100 Rugged Series Switches.

Table 14: Physical Specifications

Switch	Weight	Dimensions (H x W x D)
IE-3100-4T2S-E	1.6 lb (.73 kg)	5.00 x 2.55 x 4.37 in. (12.70 x 6.48 x 11.10 cm)
IE-3100-8T2C-E	1.9 lb (.86 kg)	5.00 x 3.00 x 4.37 in (12.70 x 7.62 x 11.10 cm)
IE-3105-8T2C-E	2.3 lb (1.04 kg)	5.00 x 3.00 x 5.12 in (12.70 x 7.62 x 13.00 cm)
IE-3100-18T2C-E	2.8 lb (1.27 kg)	5.00 x 4.30 x 5.12 in (12.70 x 10.92 x 13.00 cm)
IE-3105-18T2C-E	2.8 lb (1.27 kg)	5.00 x 4.30 x 5.12 in (12.70 x 10.92 x 13.00 cm)
IE-3100-8T4S-E	1.9 lb (.86 kg)	5.00 x 3.00 x 4.37 in (12.70 x 7.62 x 11.10 cm)



Note The depth of the switch is measured from the faceplate to the front of the DIN rail.

Environmental Ranges

The following table displays environmental ranges for Cisco Catalyst IE3100 Rugged Series Switches.

Table 15: Environmental Ranges

Measure	Range
Operating temperature	<ul style="list-style-type: none"> • Blower-equipped cabinet: -40°C to $+75^{\circ}\text{C}$ (-40°F to 167°F) • Vented cabinet: -40°C to $+70^{\circ}\text{C}$ (-40°F to 158°F) • Sealed cabinet: -40°C to $+60^{\circ}\text{C}$ (-40°F to 140°F)
Storage temperature	-40°C to $+85^{\circ}\text{C}$ (-40°F to 185°F)
Relative humidity	5 percent to 95 percent noncondensing
Operating altitude	<ul style="list-style-type: none"> • Up to 15,000 feet (4572 m) with no temperature derating • Up to 40,000 feet (12,192 m) with temperature derated at 25°C (77°F)
Storage altitude	Up to 40,000 feet (12,192 m)
Thermal spacing	1.0 in (25.4 mm) clearance top, sides, and bottom
Operational shock	50G at 11ms, half sine and 200G at 2.11ms, half sine
Nonoperational shock	65 to 80G at 9ms, trapezoidal

Alarm Ratings

Specification	Description
Alarm input electrical specification	<p>Senses an external dry contact. The open circuit voltage between any alarm input (1 to 2) and alarm input common is 3.3 VDC. The loop current is 3 mA max per input.</p> <p>Do not apply external power to the alarm input.</p>
Alarm output electrical specification	30VDC @ 1A, 60VDC @ 0.5A (Resistive load only).

Power Input Ratings

Switch Model	Maximum Current
IE-3100-4T2S-E	12VDC–48VDC, 1.6 A
IE-3100-8T2C-E	12VDC–48VDC, 2.0 A
IE-3100-8T4S-E	12VDC–48VDC, 2.1 A
IE-3100-18T2C-E	12VDC–48VDC, 4.2 A
IE-3105-8T2C-E	12VDC–48VDC, 3.2 A
IE-3105-18T2C-E	12VDC–48VDC, 4.2 A

Installation Guidelines for Utility, Railway, and Marine Environments

Follow the guidelines in this section when installing the switch in utility, railway, and marine environments:

- Use shielded Ethernet cables to comply with the EMC requirements for power utility, power stations, railways, and marine environments. These installations refer to DNVGL CG-0339, IACS UR E10, IEC 60945.
- Use industrial grade SFP modules that are rated for -40C to +85C operation.
- For marine installations, you must install the product inside a metal enclosure, preferably IP54 or better.



CHAPTER 8

Troubleshooting

- [Diagnosing Problems, on page 93](#)
- [Switch LEDs, on page 93](#)
- [Switch Connections, on page 93](#)
- [Switch Performance, on page 95](#)
- [Reset the Switch, on page 96](#)
- [Recovering Passwords, on page 97](#)
- [Finding the Switch Serial Number, on page 97](#)

Diagnosing Problems

The switch LEDs provide troubleshooting information about the switch. They show port-connectivity problems and overall switch performance. You can also get statistics from the Web UI, the CLI, or an SNMP workstation. See the software configuration guides for [Cisco Catalyst IE3100 Rugged Series Switches](#) or the documentation that came with your SNMP application for details.

Switch LEDs

Look at the port LEDs information when troubleshooting the switch. See the LED information in the chapter [Cisco Catalyst IE3100 Rugged Series Switches, on page 1](#) for a description of the LED colors and their meanings.

Switch Connections

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 convertors between the source and the destination. If possible, bypass the patch panel, or eliminate media convertors (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 copper cable for 10 Mb/s UTP connections. Use either Category 5, Category 5e, or Category 6 UTP for 10/100, 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 although 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 the chapter [Cables and Connectors, on page 63](#) in this guide 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, complete the following steps.

- Verify the status of all ports by checking the LEDs. For more information, see information about LEDs in the chapter [Cisco Catalyst IE3100 Rugged Series Switches, on page 1](#) in this guide.
- Use the **show interfaces** privileged EXEC command to see if the port is error-disabled, disabled, or shut down. Re-enable the port if necessary.
- Verify the cable type.

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** privileged EXEC 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 reenable the interface. Use the **show interfaces** privileged EXEC command to see if the interface is error-disabled, disabled, or shut down on either side of the connection. If needed, reenable 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

Speed, Duplex, and Autonegotiation

Port statistics that show a large amount 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.

Reset 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.

Attention :

Si vous appuyez sur le bouton de configuration express lors de la mise sous tension, la séquence de démarrage automatique s'arrête et le commutateur passe en mode de chargeur de démarrage.

To reset the switch, complete the following steps.

-
- Step 1** Press and hold the Express Setup button for 15 to 20 seconds with a paper clip or similar object. The button is recessed behind a small hole in the faceplate. The Express Setup LED turns green after the switch reboots. The switch reboots and returns to the manufacturing default configuration.
- Step 2** Press the Express Setup button again for 3 seconds. A switch 10/100/100 Ethernet port blinks green.
-

What to do next

The switch now behaves like an unconfigured switch. You can configure the switch by using the CLI setup procedure that is described in the [Switch Configuration with the CLI Setup Program](#) chapter in this guide. You can also configure the switch by using Express Setup as described in the [Express Setup](#) chapter in this guide.

Recovering Passwords

The default configuration for the switch allows an end user with physical access to the switch to recover from a lost password by interrupting the boot process during power-on and by entering a new password. These recovery procedures require that you have physical access to the switch.



Note On these devices, a system administrator can disable some of the functionality of this feature by allowing an end user to reset a password only by agreeing to return to the default configuration. If you are an end user trying to reset a password when password recovery has been disabled, a status message reminds you to return to the default configuration during the recovery process.

See [Reset the Switch, on page 96](#) in this guide for instructions on resetting the switch and entering a new password.

Finding the Switch Serial Number

If you contact Cisco Technical Assistance, you must know the serial number of your switch. You can also use the **show version** privileged EXEC command to obtain the switch serial number.

Also, the Serial Number for the switch is printed on the device label, on the device itself.

