Switch Installation

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   **Statement 1003**—DC Power Disconnection

To reduce risk of electric shock or personal injury, disconnect DC power before removing or replacing components or performing upgrades.

Warning   **Statement 1017**—Restricted Area

This unit is intended for installation in restricted access areas. Only skilled, instructed, or qualified personnel can access a restricted access area.

Warning   **Statement 1024**—Ground Conductor

This equipment must be grounded. To reduce the risk of electric shock, 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.

⚡

Warning **Statement 1028**—More Than One Power Supply

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.
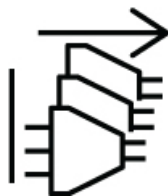
⚡

Warning **Statement 1074**—Comply with Local and National Electrical Codes

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.

⚡

Warning **Statement 1255**—Laser Compliance Statement

Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.

⚡

Warning **Statement 9001**—Product Disposal

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

⚠

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, TOP HAT RAILS TH 35-7.5 OR TH 35-15.

Attention :

L'appareil est conçu pour être monté sur un rail DIN conforme à la norme IEC/EN60715, TOP HAT RAILS TH 35-7.5 OR TH 35-15.

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.

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

Procedure

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.

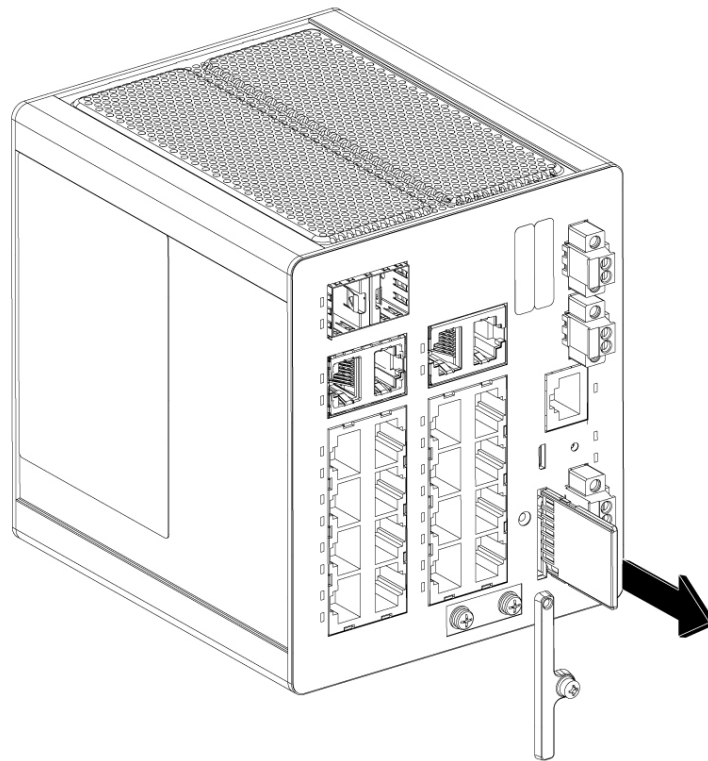 The card is keyed so that you cannot insert it the wrong way.

Figure 1: Installing the Flash Memory Card in the Switch
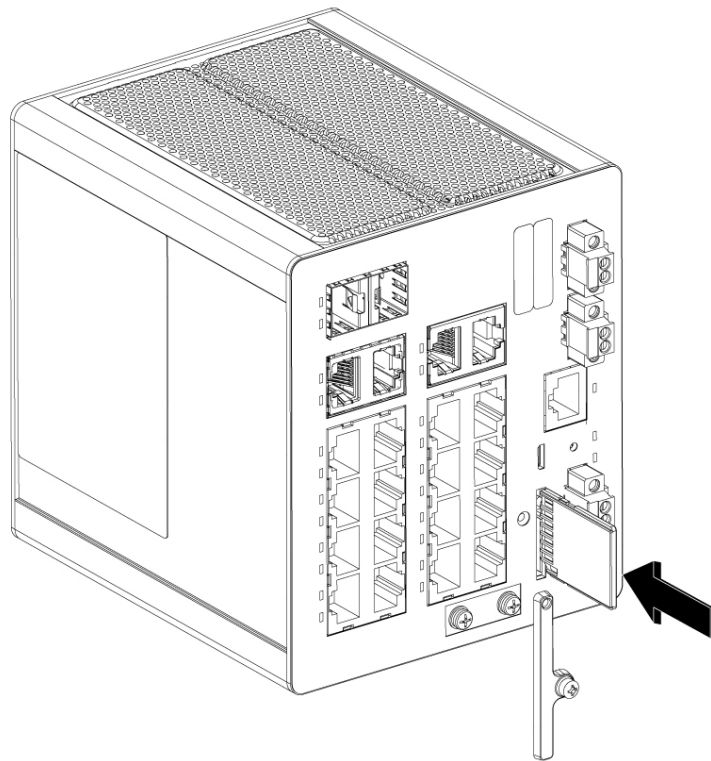
    b. Close the guard door and fasten the captive screw using a Phillips screwdriver to keep the door in place.

- **a.** To remove the card, push it in until it releases for it to pop out.

Figure 2: 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.

Procedure

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 3: Connecting the Console Cable to the RJ-45 Console Port
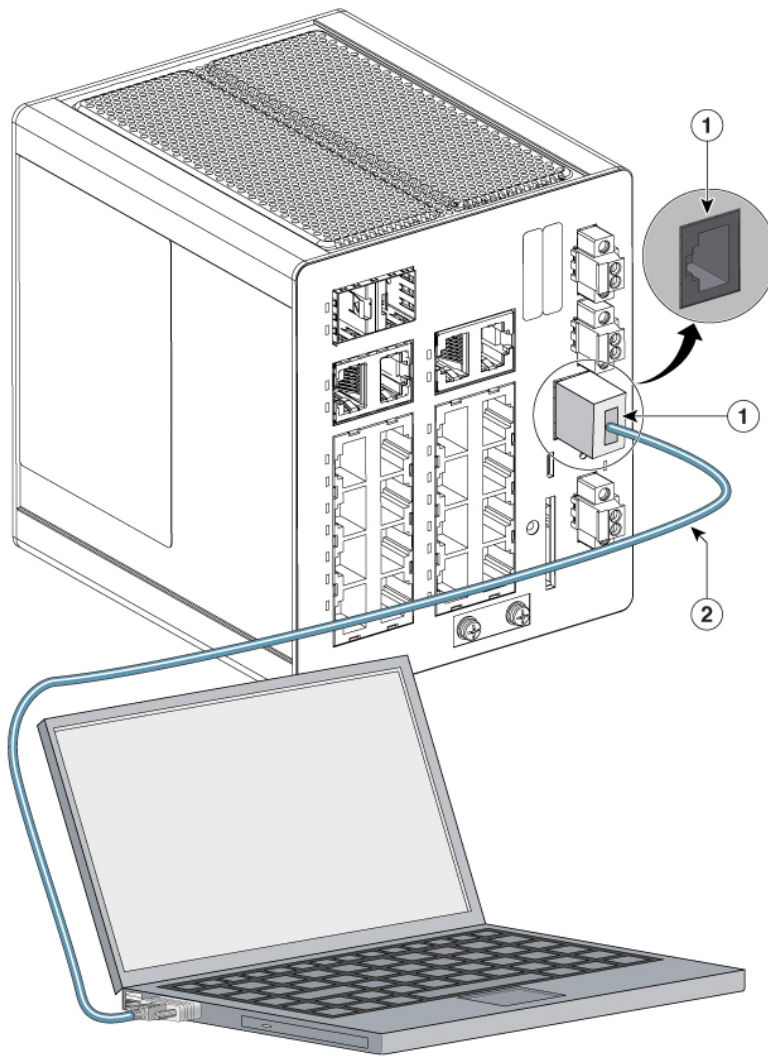
1	RJ-45 console port	2	Console cable (RJ-45-to-DB-9 adapter cable)

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.

Procedure

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.
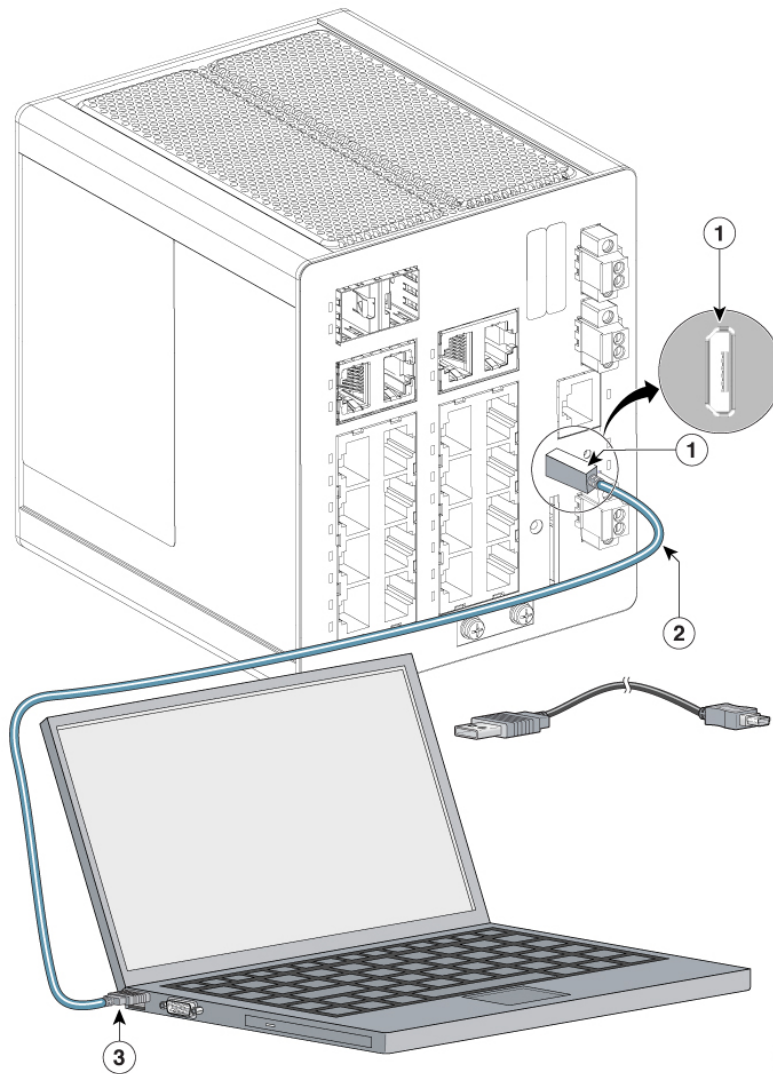
Figure 4: Loosening the Cover
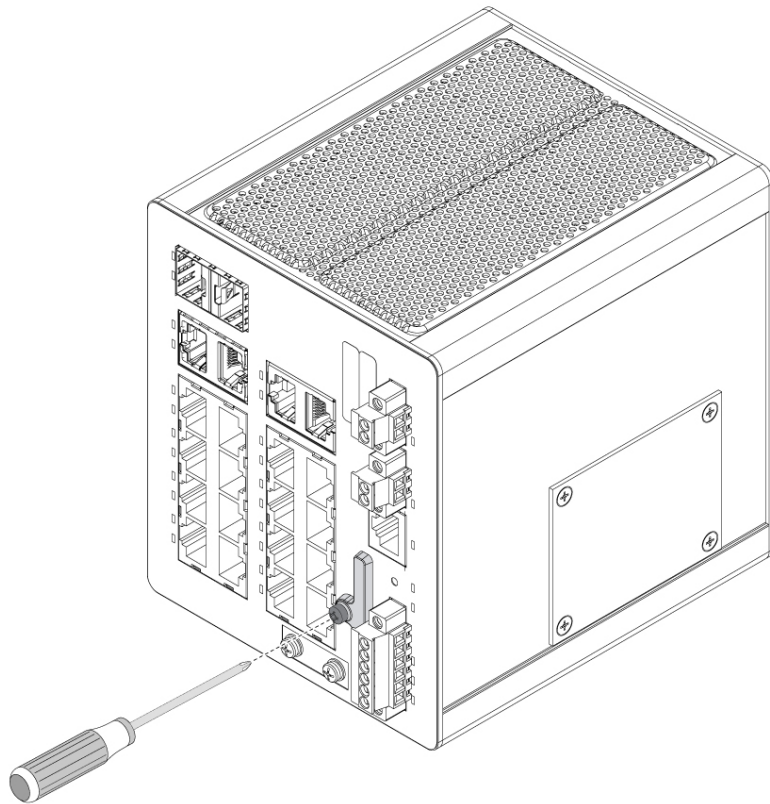
Step 2   Remove the cover.

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 5: 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:

a) Choose **Start** > **Control Panel** > **System>**.

b) 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.

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 **Statement 1024**—Ground Conductor

This equipment must be grounded. To reduce the risk of electric shock, 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.

Caution PoE output power is not isolated from the switch's power input. Connecting PoE ports between IE3x00 systems may create a power loop. The energy from an external surge can pass through the switch and among the PoE ports.

Caution If an internal fault occurs, switches with PoE-capable Ethernet ports may apply PoE power to a port even when it is not connected to a PoE powered device.

You must use appropriate protection to ensure that such events do not create a hazard.

⚠️

Caution   On switches that support PoE, do not connect any terminal of the DC power source to earth ground.

⚠️

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).

⚠️

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

Procedure

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 6: Crimping the Ring Terminal
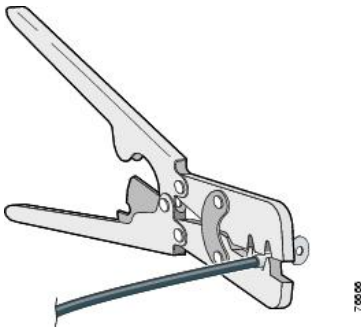
**Step 4**   Slide the ground screw through the terminal.

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).

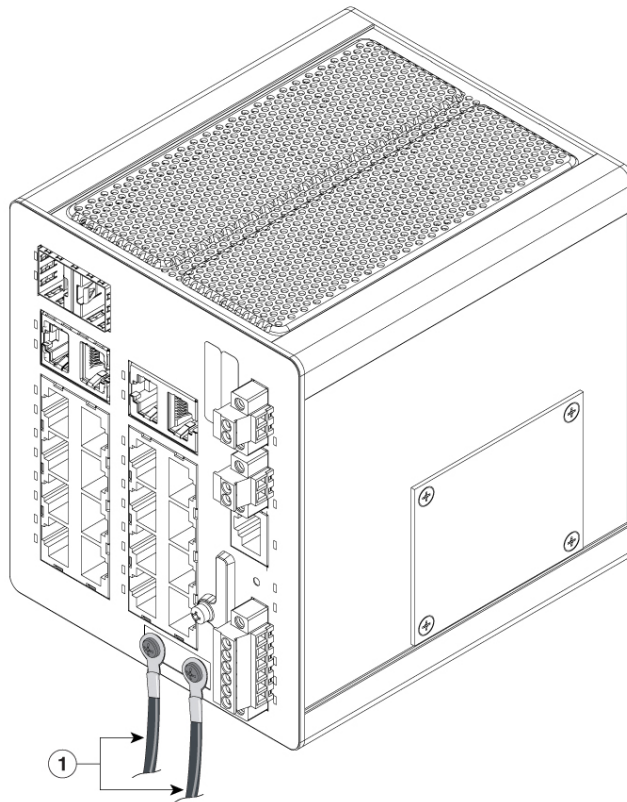**Note**
Do not exceed 3.5 in-lb (0.4 N-m) of torque.

Figure 7: Installing the Ground-Lug Screw (Single Ring Terminal)
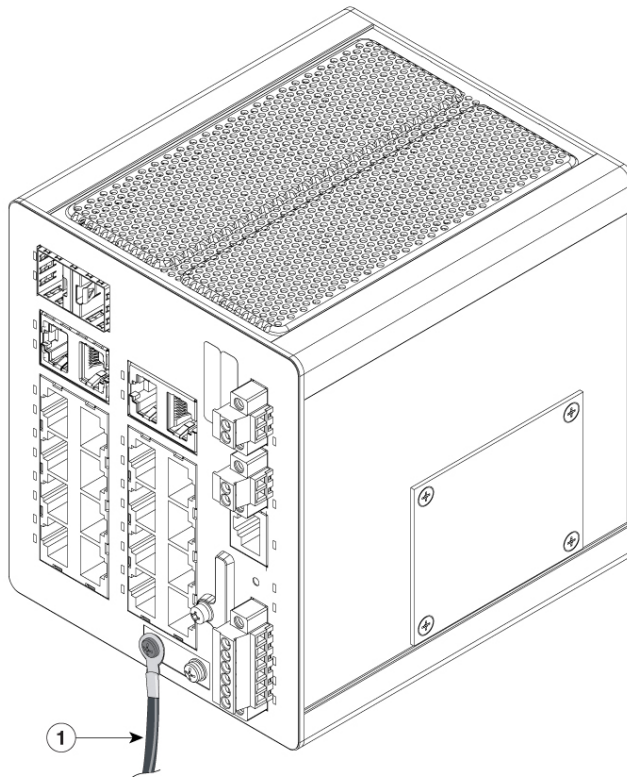
1	Ground cable

Figure 8: 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.

Procedure

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 9: Connecting AC Power
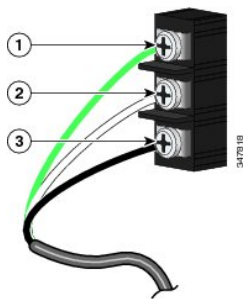
1	Ground	3	AC line
2	AC neutral		

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.

Procedure

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 10: AC/DC Power Input Terminal Block Wire Connections to a DC Source
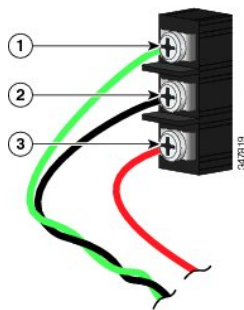
1	Earth ground wire connection	3	Positive DC connection
2	Return wire connection (to DC return)		

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   **Statement 1022**—Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.

⚠️

Warning   **Statement 1005**—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

Non-PoE models—**3A**

PoE models—**7A**

⚠️

Warning   **Statement 1074**—Comply with Local and National Electrical Codes

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.
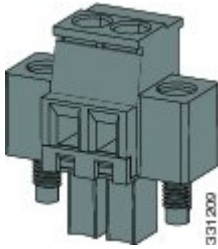
⚠️

Warning   **Statement 1003**—DC Power Disconnection

To reduce risk of electric shock or personal injury, disconnect DC power before removing or replacing components or performing upgrades.

Procedure

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 11: 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 1: 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.
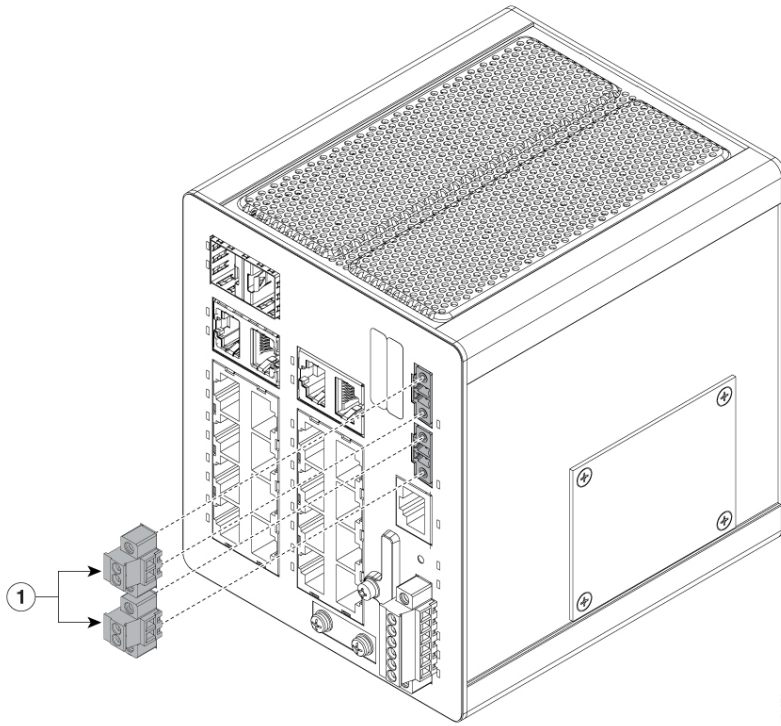
Figure 12: Stripping the Power Connection Wire

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 13: 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 14: Inserting Wires in the Power Connector
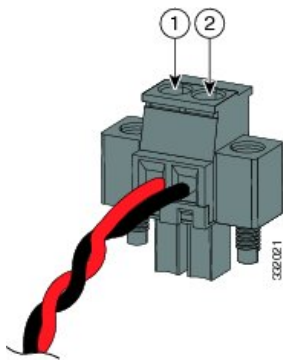
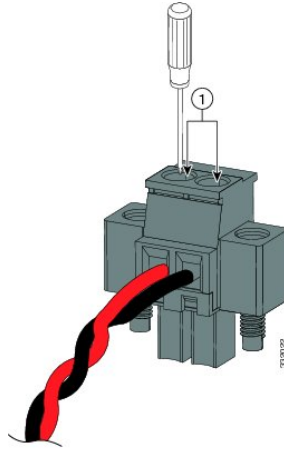| 1	Power source positive connection	2	Power source return connection

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 15: 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 16: Completed DC Power Connections on the Power Connectors
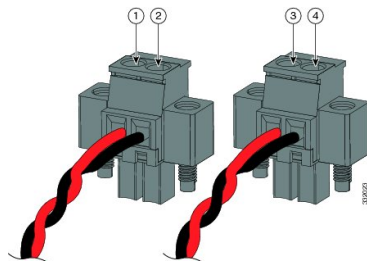
1	Power source A positive connection	3	Power source B positive connection
2	Power source A return connection	4	Power source B return connection

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:

Procedure

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.

*Figure 17: Attaching the Power Connectors to the Switch*
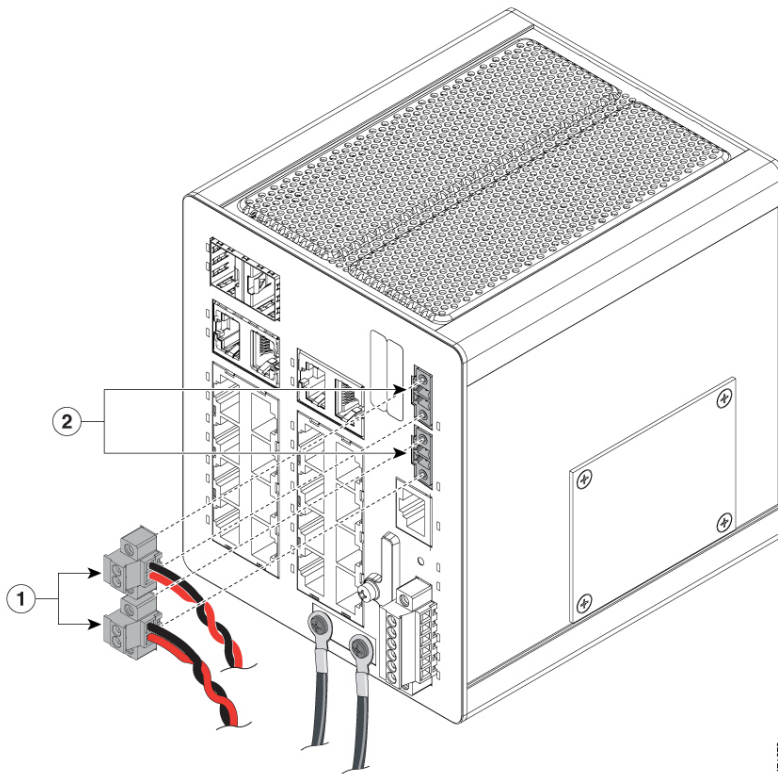
1	DC-A power connectors	2	DC-A power connections

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 18: Tightening the Captive Screws
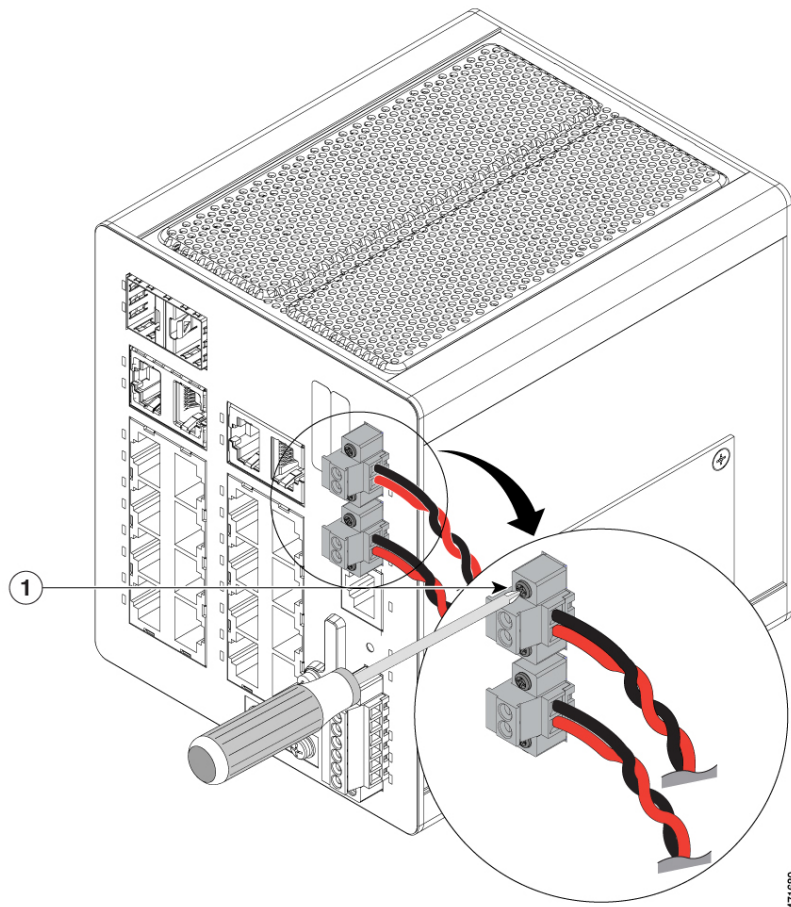
1	DC-A power connector upper captive screw

Apply Power to the Power Converter

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

Procedure

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.
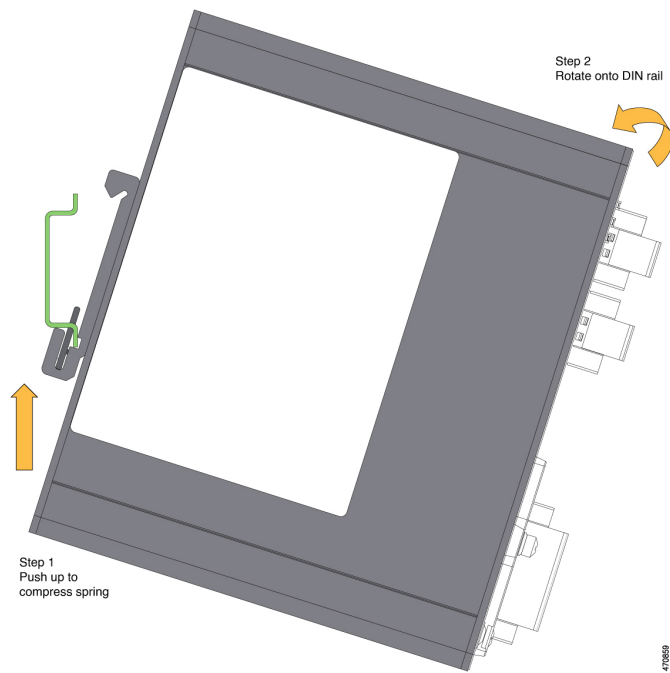
Figure 19: Bracket Attached to the DIN Rail
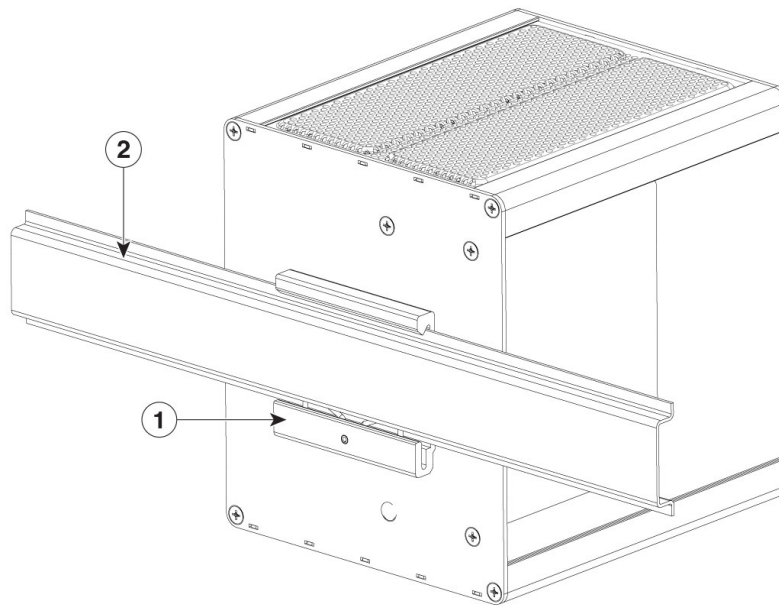
| 1	DIN rail bracket
2	DIN rail

Procedure

Step 1 a) 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.

b) Push up to compress the spring.

Step 2
Rotate onto DIN rail

Step 1
Push up to
compress spring

470859

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.

470860
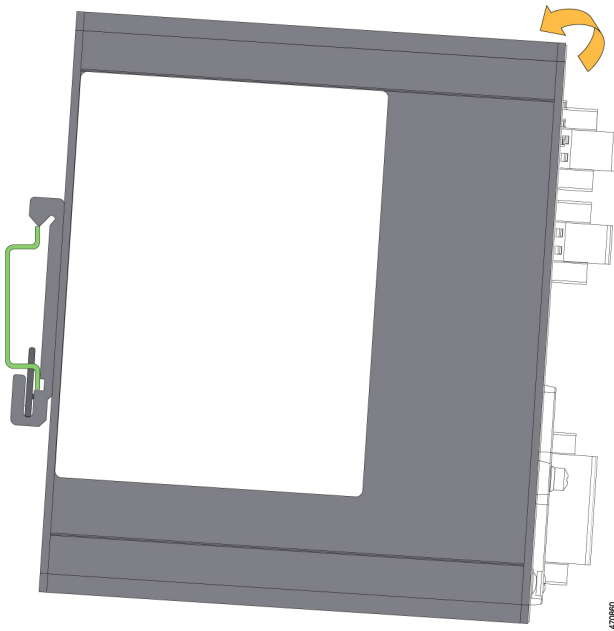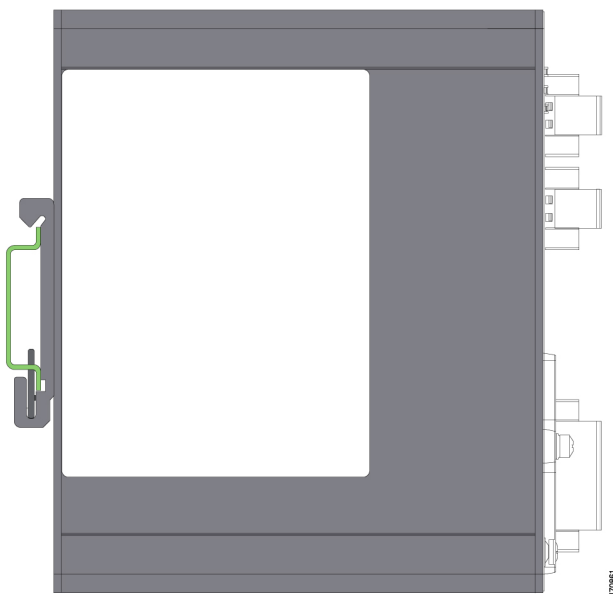
What to do next

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 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.

Procedure

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

Step 2
Rotate away from DIN rail

Step 1
Push up to
compress spring

470862
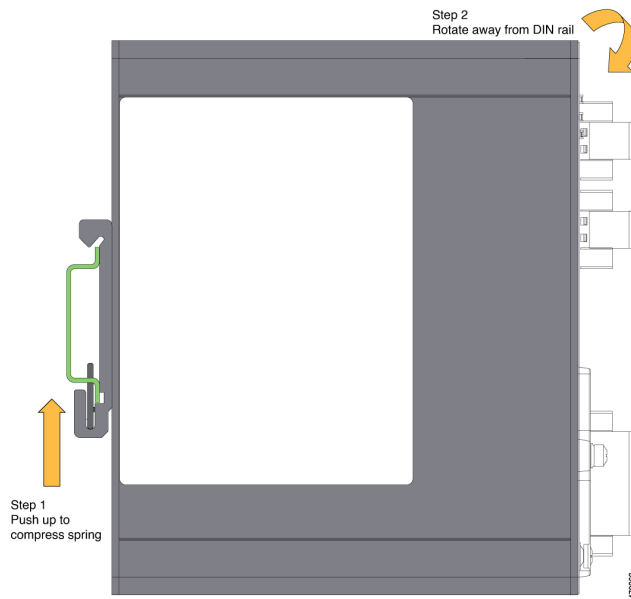
Step 2   Grasp the upper part of the switch and rotate it away from the DIN rail.

Refer to the following figure.

470863
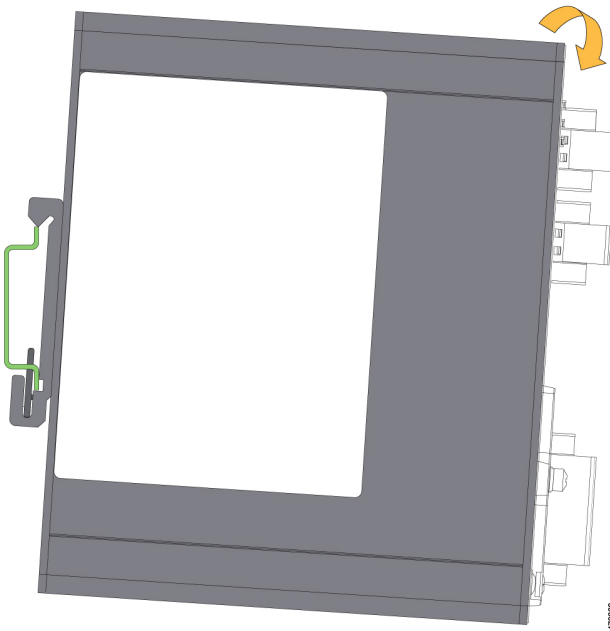
Step 3   Lower the switch away from the DIN rail and remove it.

Refer to the following figure.

Step 3
Remove from
DIN rail

470864
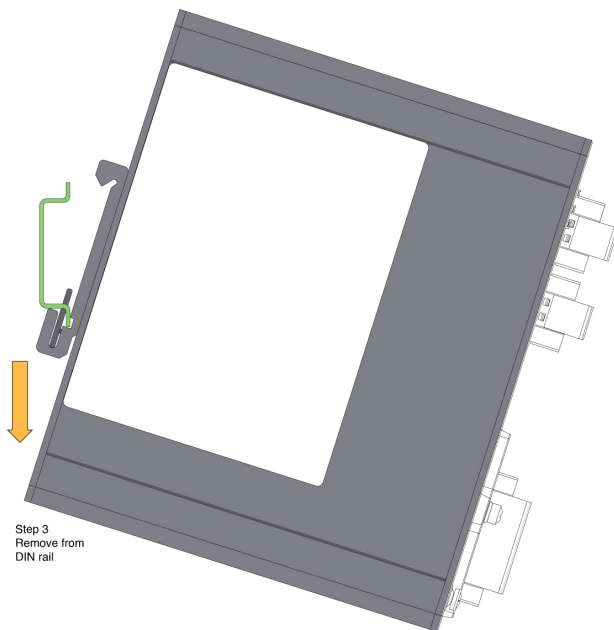
Connecting Alarm Circuits

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 13.

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 2: 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

⚠️

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).

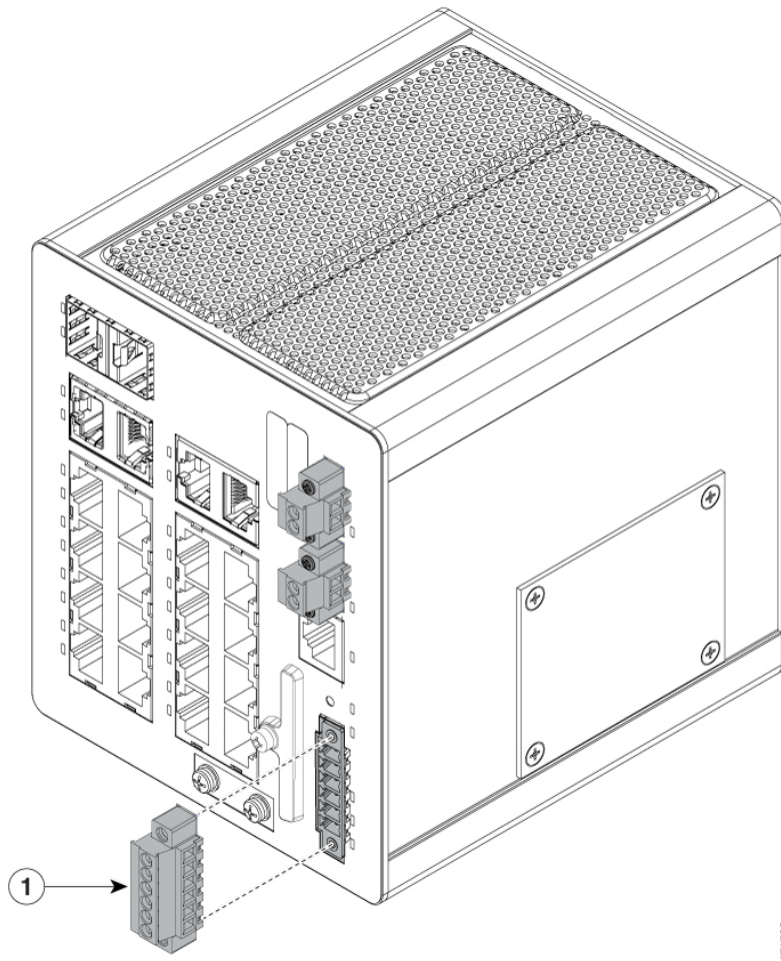Complete the following steps to wire the external alarms.

Before you begin

Read the following content before wiring the external alarms.

Procedure

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

Figure 20: Removing the Alarm Connector

1	Alarm connector

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 21: Inserthing Wires into the Alarm Connector (Alarm Input Circuit)
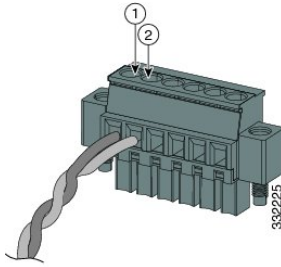
| 1	IN1 - External device connection 1	2	REF - External device connection 2

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 22: Securing the Alarm Connector Captive Screws
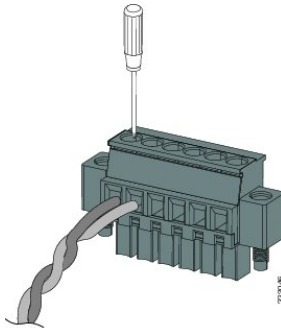
Step 6 Repeat the preceding steps to insert the input and output wires of another external alarm device into the alarm connector.

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 23: Completed Connections for Three External Alarm Devices on the Alarm Connector
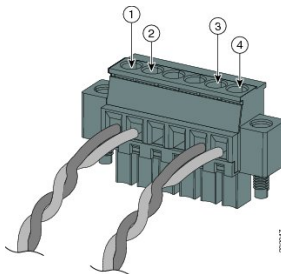
1	IN1 wired connection	3	COM wired connection

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.

Procedure

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

Figure 24: Connecting the Alarm Connector to the Switch
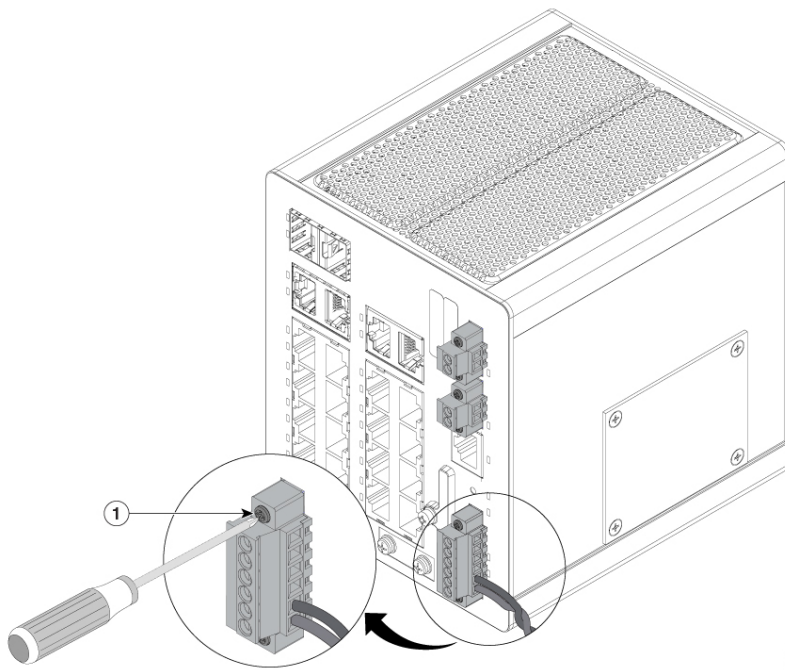
1	Alarm connector upper captive screw

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.

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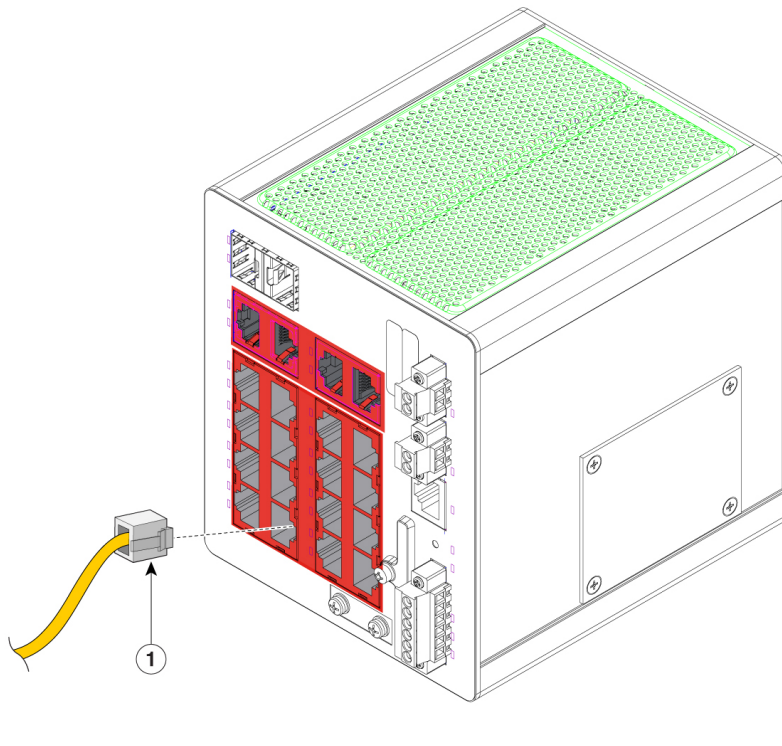
To connect to 10BASE-T, 100BASE-TX, or 1000BASE-T devices, complete the following steps:

Procedure

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 25: 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.

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 26: LC SFP Module with Open Bale-Clasp Latch
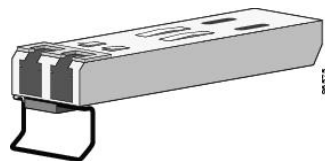
Procedure

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 27: Installing an SFP Module into an SFP Module Slot
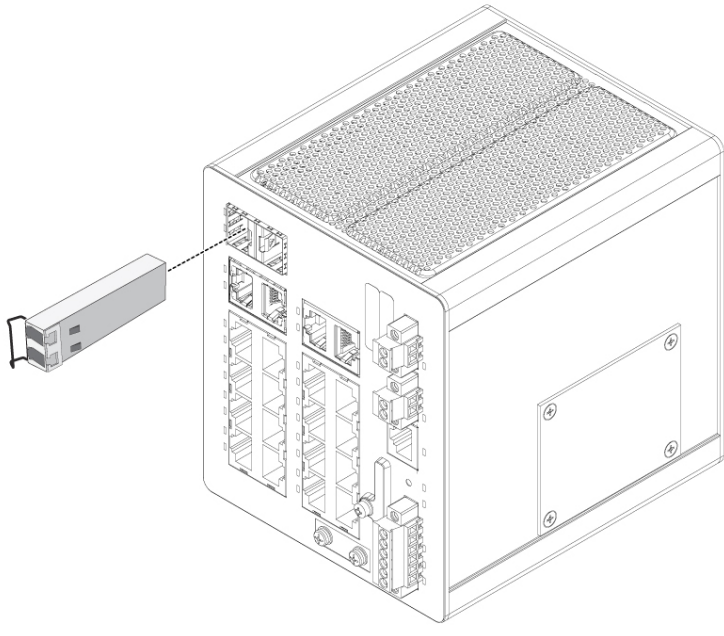
Note
You can insert the SFP module into either of the two ports outlined in red in the preceding illustration.

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 28: 1000BASE-T SFP Transceiver
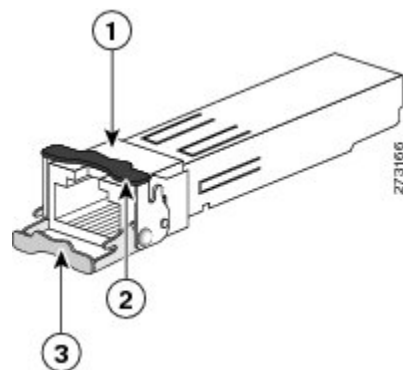
1	RJ-45 connector	3	Open bale-clasp latch (unlocked)
2	Closed bale-clasp latch mechanism (locked)		

⚠

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.

Procedure

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.

Procedure

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 29: Opening a Bale-Clasp Latch on an SFP Module
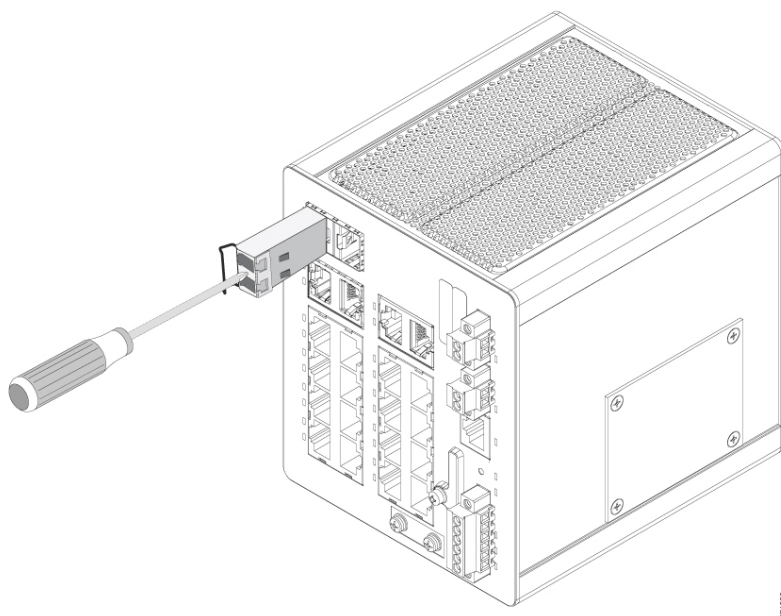
Step 5   Grasp the SFP module between your thumb and index finger, and carefully remove it from the module slot.

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 icon]

Warning   **Statement 1008**—Class 1 Laser Product

This product is a Class 1 laser product.

![note icon]

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

![caution icon]

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:

Procedure

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 30: Connecting to a Fiber-Optic SFP Module Port
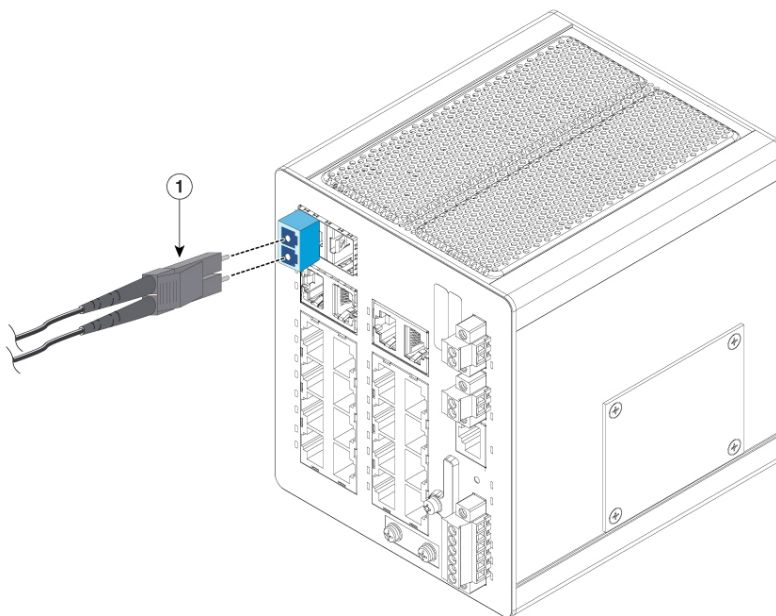
1	LC connector

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:

Procedure

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
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.

LED State	Description
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 in this guide.

⚠

Warning **Statement 1008**—Class 1 Laser Product

This product is a Class 1 laser product.

⚠

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 1 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.

Procedure

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 31: Connecting to a Dual-purpose Port
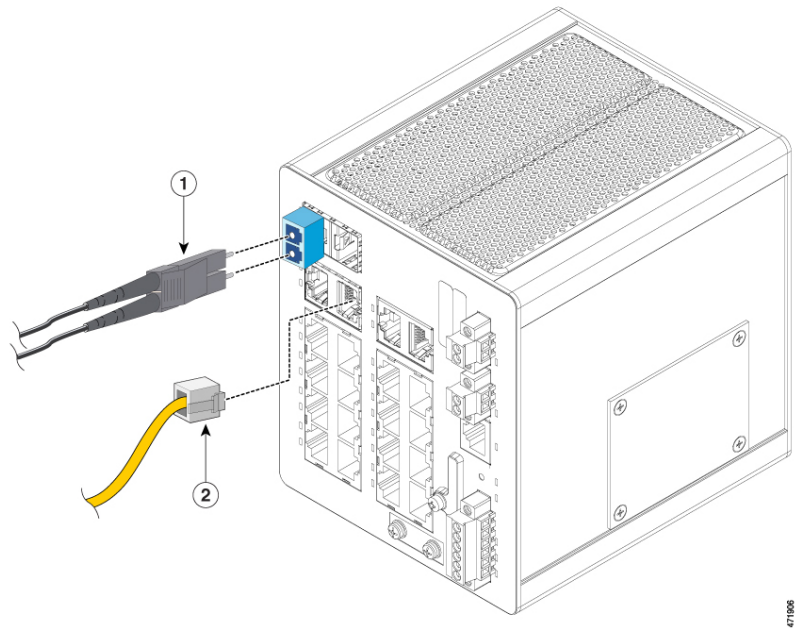
1	SFP connector	2	RJ-45 connector

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 35, Installing and Removing SFP Modules, on page 36, and Connecting to SFP Modules, on page 41 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.