Switch Installation

This chapter describes how to install your switch, verify the boot fast, and connect the switch to other devices.

We recommend performing a preliminary configuration of the switch before it is installed in a permanent location.

Preparing for Installation

Warnings

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 1033—**Safety Extra-Low Voltage (SELV)—IEC 60950/ES1–IEC 62368 DC Power Supply

To reduce the risk of electric shock, connect the unit *only* to a DC power source that complies with the SELV requirements in the IEC 60950-based safety standards or the ES1 requirements in the IEC 62368-based safety standards.

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 1079—**Hot Surface

This icon is a hot surface warning. To avoid personal injury, do not touch without proper protection.

Note **Statement 1089—**Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.

Warning **Statement 1091—**Installation by an Instructed Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed or skilled person.

Warning **Statement 9001—**Product Disposal

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

Note **Statement 407**—Japanese Safety Instruction

You are strongly advised to read the safety instruction before using the product.

https://www.cisco.com/web/JP/techdoc/pldoc/pldoc.html

When installing the product, use the provided or designated connection cables/power cables/AC adapters.

〈製品使用における安全上の注意〉

www.cisco.com/web/JP/techdoc/index.html

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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 mm)– Sides: 1.0 in. (25 mm)– Front: 1.0 in. (25 mm)

Caution If installer is providing cabling for an IP66/IP67 and Type-4 rated environment, the cables must be suitably rated for IP66/IP67 and Type-4 requirements

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.

Installation Guidelines

When determining where to place the switch, observe these guidelines.

Environment and Enclosure Guidelines

Review these environmental and enclosure guidelines before installation:

- 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.

Caution To meet IP67 Compliance, all cables, dust caps, or the captive screws on the SD card cover must be torqued to the recommended spec before operating the unit.

Caution Use caution when removing dust caps. Dust caps in an over-tightened state may adhere to the connector O-ring seal. Ensure that the O-ring remains in place when dust caps are removed and follow all torque specs here:

General Guidelines

Before installation, observe these general guidelines:

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.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.

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

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

- Before installing the switch, first verify that the switch is operational by powering it on and observing boot fast.
- 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).
- Operating environment is within the ranges listed in Appendix F, “Technical Specifications.”
- Clearance to front and rear panels meets these conditions:
  - Front-panel LEDs can be easily read.
  - Access to ports is sufficient for unrestricted cabling.
  - Front-panel direct current (DC) power connectors are within reach of the connection to the DC power source.
- Airflow around the switch must be unrestricted. To prevent the switch from overheating, you must have the following minimum clearances:
  - Top and bottom: 1.0 in. (25 mm)
  - Sides: 1.0 in. (25 mm)

  - Front: 1.0 in. (25 mm)

- Ambient temperature does not exceed 140°F (60°C).
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures.

Verifying Package Contents

Included in the box is the switch itself and it's installation documentation. If any item is missing or damaged, contact your representative or reseller for support.

Tools and Equipment

Obtain these necessary tools and equipment:

- A single or a pair of stud size 6 ring terminals (Hollingsworth part number R3456B or equivalent) for use as a protective ground connector.
- Crimping tool (Thomas & Bett part number WT2000, ERG-2001 or equivalent).
- 10-gauge copper ground wire.
- UL- and CSA-rated, style 1007 or 1569 twisted-pair copper appliance wiring material (AWM) wire for DC power connections.
- Wire-stripping tools for stripping 10-, 16-, and 18-gauge wires.
- Number-2 Phillips screwdriver.
- Flat-blade screwdriver.
- Torque Driver (Such as a Torqueleader TT500 or equivalent)

Installing or Removing the Memory Card (Optional)

The switch supports a hot-swappable SD memory card firmware and the startup configuration are stored, making it possible to replace a failed switch without reconfiguring the replacement switch.

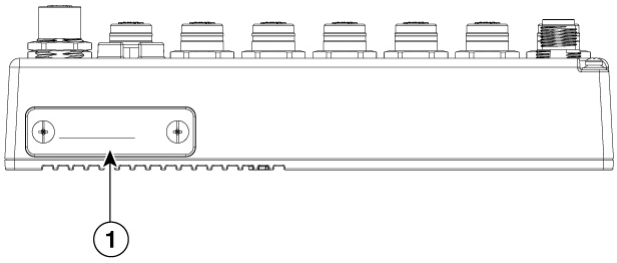
The SD memory card cover protects the flash card against shock and vibration by holding the card in place. The cover is attached via lanyard, and secured with captive screws. The slot for the SD memory card is located on the side of the switch.

Note The switch supports upto 16 GB capacity SD-card.

To install or replace the SD memory card, follow these steps:

Procedure

Step 1 On the side of the switch, loosen the captive screws until they are free of the chassis. See the following figure.



1	SD card slot cover with captive screws (2x)

Step 2 Install or remove the card:

- To remove the card, push it in until it releases for it to pop out. Place it in an antistatic bag to protect it from static discharge.
- To install a card, slide it into the slot, and press on it until it clicks in place. The card is keyed so that you cannot insert it the wrong way.

Step 3 Close the guard door and fasten the captive screws to 3.5 to 4.5 in-lbs (0.40 to 0.51 Nm) to maintain IP67 compliance.

Connecting a PC or Terminal to the Console Port

To configure the device, you can connect a PC or terminal to the console port and enter Cisco IOS commands through the CLI. This section describes the procedure for connecting a PC to the console port and using a terminal emulator application, such as PuTTy or Hyperterminal, to configure the device.

Procedure

Step 1 Connect the console cable (Cisco PID CAB-CONSOLE-M12=) to a 9-pin serial port on a PC. Connect the other end of the cable to the switch console port.

Step 2 Start a terminal-emulation program on the PC or the terminal. The program, frequently a PC application such as PuTTy or HyperTerminal, 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.

Step 5 The PC or terminal shows the status of the bootup sequence. The switch will auto boot. When the IOS XE software has completed the bootup process the words "Press RETURN to get started!".

Note
If you plan to use the Plug N Play (PNP) agent for automating day 1 install, then do not press return. this stops the automated install of PNP. Press return only to use the CLI to complete the Day 1 install process.

Connecting to Power

You must supply a power solution for the device. The input voltage should be between 9.6 and 60 Vdc

If a custom power supply is used, use the power cable with pig tail ends. Connect the female end of the M12 Power L-code cable to the power connector on the switch (torque—0.60 Nm/5.3 in-lbs) and connect the pigtail to the non-standard power supply.

Grounding the Switch

Follow any grounding requirements at your site.

Warning **Statement 2004—**Grounded Equipment

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.

Note A ground lug is not supplied with the switch. Use a single ring terminal lug.

To ground the switch to earth ground by using the ground screw, follow these steps:

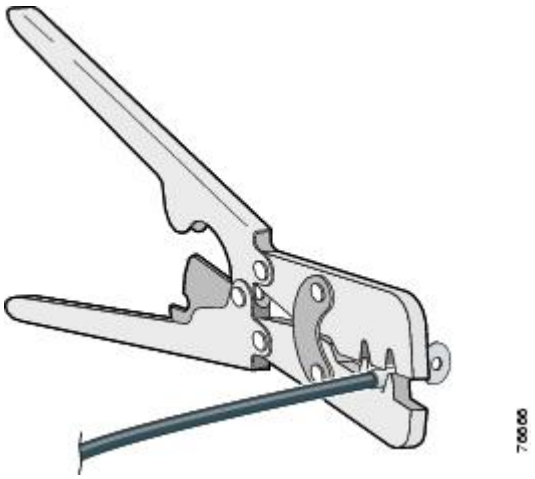
Procedure

Step 1 Use a standard Phillips screwdriver or a ratcheting torque screwdriver with a Phillips head to remove the ground screw from the switch. Store the ground screw for later use.

Step 2 Use the manufacturer 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.

Figure 1: Crimping the Ring Terminal



Step 4 Slide the ground screw through the terminal.

Step 5 Insert the ground screw into the ground screw opening.

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). The torque must not exceed 3.5 in-lb (0.4 N-m).

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 earth ground wire

Procedure

Step 1 Measure a single length of stranded copper wire long enough to connect the power supply to the earth ground. The wire color might differ depending on the country that you are using it in.

Note
For connections from the power supply to earth ground, use 10 to 12-AWG stranded copper wire.

Step 2 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.

Connect the other end of the wire to the grounding screw on the power supply. Only wire with insulation should extend from the connection.

Note
The position of the power supply may vary on different switch models.

Step 3 Tighten the earth-ground wire connection screw.

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

Connecting Destination Ports

These section provides information about connecting to the destination ports.

Connecting to 10/100 and 10/100/1000 Ports

The 10/100 and 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 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.

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

To connect to 10BASE-T, 100BASE-TX or 1000BASE-T devices, follow these steps:

Procedure

Step 1 When connecting to workstations, servers, routers, and Cisco IP phones, connect a straight-through cable to a M12 connector (IP67 Torque: 4.43 to 7.08 in/lbs or 0.5 to 0.8 Nm) on the front panel.

When connecting to 1000BASE-T-compatible devices, use a twisted four-pair, Category 5 or higher cable.

The auto-MDIX feature is enabled by default.

Step 2 Connect the other end of the cable to a M12 connector on the other device. The port LED turns on when both the switch and the connected device have established a 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 installed in the attached device. See Chapter 4, “Troubleshooting,” for solutions to cabling problems.

Step 3 Reconfigure and reboot the connected device if necessary.

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

Where to Go Next

If the default configuration is satisfactory, the switch does not need further configuration. You can use any of these management options to change the default configuration:

- WebUI

  You can use WebUI web interface to manage and monitor individual switches. Device Manager can be accessed from anywhere in your network through a web browser by using the management IP address of the switch. For more information, see the Device Manager online help.

- Cisco IOS-XE CLI

  The switch CLI is a version of Cisco iOS firmware that can be used to configure and monitor the switch. You can access the CLI either by connecting your management station directly to the switch console port or by using Telnet from a remote management station.

- Cisco Catalyst Center that can be found at: https://www.cisco.com/site/us/en/products/networking/catalyst-center/index.html

- SNMP

  Switches can be managed by using a SNMP-compatible management station 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.

- Common Industrial Protocol

  Common Industrial Protocol (CIP) management objects are supported by the switch, allowing you to manage an entire industrial automation system with one tool.