




Installing S50N and S50V Systems



Force10

Notes, Cautions, and Warnings

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.
-  **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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About this Guide

This guide provides site preparation recommendations, step-by-step procedures for rack mounting and desk mounting the S50V or S50N switches (and related models, such as S50N-DC), inserting optional modules, and connecting to a power source. Except where noted, descriptions and instructions in this guide apply to all variants of these switches.




After you have completed the hardware installation and power-up of the switch, refer to the *SFTOS™ Configuration Guide* for software configuration information and to the *SFTOS™ Command Reference* for detailed Command Line Interface (CLI) information.


Information Symbols and Warnings

The following graphic symbols are used in this document to bring attention to hazards that exist when handling the switch and its components. Please read these alerts and heed their warnings and cautions.


[Table 1-1](#) describes symbols contained in this guide.

Table 1-1. Information Symbols

Symbol	Warning	Description
	Note	This symbol informs you of important operational information.
	Caution	This symbol informs you that improper handling and installation could result in equipment damage or loss of data.
	Warning	This symbol signals information about hardware handling that could result in injury.


















 **WARNING:** The installation of this equipment shall be performed by trained and qualified personnel only. Read this guide before installing and powering up this equipment. This equipment contains two power cords. Disconnect both power cords before servicing.

 **WARNING:** Class 1 laser product.

 **Attention:** Produit laser de classe 1

 **Warnung:** Laserprodukt der Klasse 1



-  **WARNING:** This equipment contains optical transceivers, which comply with the limits of Class 1 laser radiation. Visible and invisible laser radiation may be emitted from the aperture of the optical transceiver ports when no cable is connected. Avoid exposure to laser radiation and do not stare into open apertures.
-  **WARNING:** Building Supply Notice for AC Power Supply Use. This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).
-  **Attention:** Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).
-  **Warnung:** Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird.
-  **WARNING:** Building Supply Notice for DC Power Supply Use. An external disconnect must be provided and be easily accessible. Dell Force10 recommends the use of a 60A circuit breaker.
-  **ATTENTION:** Un interrupteur externe doit être fournis et doit être facilement accessible. Dell Force10 recommande l'utilisation d'un disjoncteur de 60Ampères.
-  **WARNUNG:** Eine leicht zugängliche Tren Dell Force10 nvorrichtung muss in der Verdrahtung eingebaut sein. Dell Force10 empfiehlt einen 60A Sicherungsautomaten zu benutzen
-  **CAUTION:** Wear grounding wrist straps when handling this equipment to avoid ESD damage.
-  **CAUTION:** Earthing (AKA grounding) connection essential before connecting supply. Always make the ground connection first and disconnect it last.
-  **CAUTION:** Disposal of this equipment should be handled according to all national laws and regulations. See [Product Recycling and Disposal on page 52](#).
-  **CAUTION:** This unit has more than one power supply connection; all connections must be removed to remove all power from the unit.
-  **ATTENTION:** Cette unité est équipée de plusieurs raccordements d'alimentation. Pour supprimer tout courant électrique de l'unité, tous les cordons d'alimentation doivent être débranchés.
-  **WARNUNG:** Diese Einheit verfügt über mehr als einen Stromanschluß; um Strom gänzlich von der Einheit fernzuhalten, müssen alle Stromzufuhren abgetrennt sein.
-  **CAUTION:** Lithium Battery Notice. Danger of explosion if battery is replaced with incorrect type. Replace only with the same type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
-  **ACHTUNG** - Explosionsgefahr wenn die Battery in umgekehrter Polarität eingesetzt wird. Nur mit einem gleichen oder ähnlichen, vom Hersteller empfohlenen Typ, ersetzen. Verbrauchte Batterien müssen per den Instructionen des Herstellers verwertet werden.
-  **ATTENTION** - Il y a danger d'explosion s'il a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au rebut les batteries usages conformement aux instructions du fabricant.
-  **NOTE:** Other cautionary statements appear in context elsewhere in this book.

Related Publications


The S50V or S50N (and related models, such as S50N-DC) can run on either FTOS or SFTOS. Depending on which software your system contains, refer to the following documents:


Table 1-2. Documentation

FTOS Documentation	SFTOS Documentation
FTOS Configuration Guide for the S-Series	SFTOS Configuration Guide
FTOS Command Reference for the S-Series	SFTOS Command Reference
S-Series and FTOS Release Notes	S-Series and SFTOS Release Notes
	S25P Quick Reference

The *Technical Documentation CD-ROM* contains the S-Series hardware guides and the FTOS and SFTOS files listed above, respectively, except for the *Release Notes*. The CD-ROMs also have:

- **MIBs:** Files for all SNMP MIBs supported by the software
- **Data sheets:** Links to Dell Force10 product data sheets

 **NOTE:** Documentation CD-ROMs do not have software. For the most recent documentation and software, please visit iSupport (registration for access to some sections is required): <http://www.force10networks.com/CSPortal20/Main/SupportMain.aspx>

 **NOTE:** The iSupport website also has a section for S-Series techtips and FAQs.

System Overview

The **S50V** and **S50N** models of the Dell Force10 S-Series are stackable, Layer 2 switch/Layer 3 routers with 48 built-in 10/100/1000 Base-T ports, four SFP ports, and up to four optional 10-Gigabit (10GbE) ports (XFP or CX4), in two expansion slots. [Figure 2-1](#) shows the front panel of the S50V. The **S50N** has the same layout; just the catalog number differs. The **S50N-DC** (see [Figure 3-1 on page 15](#)) differs only in that DC1 and DC2 status LEDs appear where the AC and DC status LEDs are on the S50V and S50N.

Figure 2-1. The S50V Front View

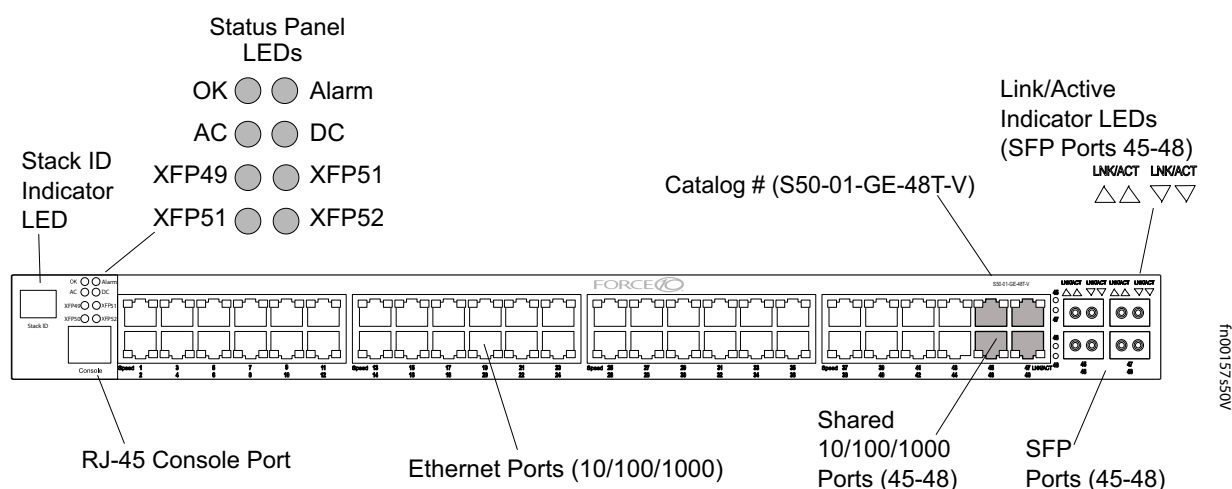
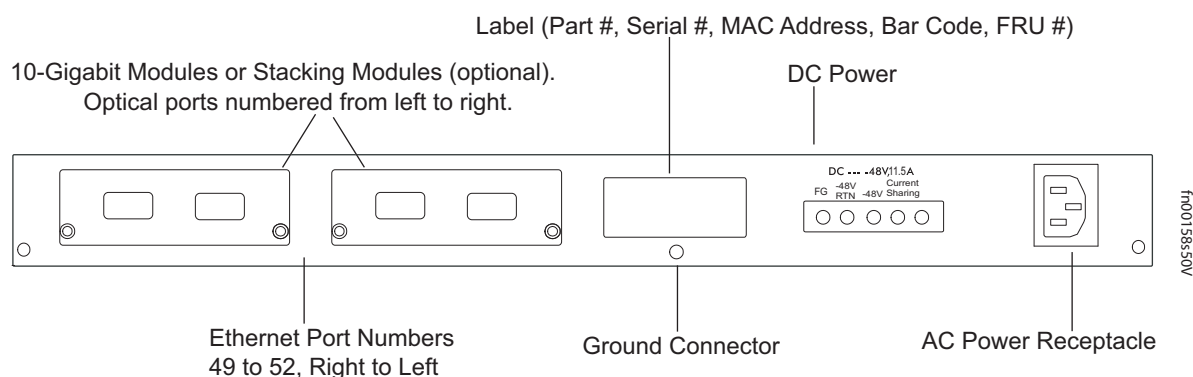


Figure 2-2. The S50V Rear View



The rear of the **S50N** differs only in that its DC terminal block has a different lug arrangement, as shown in [Figure 3-1 on page 15](#), while the **S50N-DC** replaces the AC receptacle with a second DC terminal block.

Equipment

The following items are necessary to install the system:

- The switch
- At least one grounded AC or DC power source per S50V or S50N switch; one or two grounded DC power sources per S50N-DC switch.
- Cable (included) to connect the AC power source to the switch
- Brackets for rack installation (included)
- Screws for rack installation (included) and #2 Phillips screwdriver (not supplied)

Other optional components are:

- Stacking cables for connecting switches when stacked (not supplied). See [Connecting Stack Ports \(optional\) on page 25](#).
- Backup DC Power Module (see [Chapter , Installing Backup Power, on page 29](#))
- Optical networking components (see [Chapter , Installing Ports, on page 41](#))
- Stacking components (see [Ports](#), below)

Features

- Internal power supply with power redundancy from built-in 1+1 AC/DC (AC: 110v/220v auto-detect; DC: -48V standards-based with terminal-type connectors). The one difference between the S50V and S50N is that the S50V has built-in support for 360W Power over Ethernet (PoE) — IEEE 802.3af — with power allocation control available through the CLI.
- 256MB RAM and 32MB internal Flash memory
- Supports up to 32000 MAC address entries, with hardware-assisted aging
- Stackable switch features
- 19-inch rack-mountable and standard 1U chassis height
- Six built-in fans with automatic speed adjustment for temperature changes
- Supports 9252-byte jumbo frames in FTOS, 9216-byte jumbo frames in SFTOS
- Back-pressure support at half-duplex, IEEE 802.3x flow control at full duplex
- Extensive LED system with per-port LEDs

Ports

- 48 fixed 10/100/1000 Mbps auto-sensing and auto-MDIX RJ45 ports, up to 15.4W PoE each
- Four ports capable of using 10/100/1000 Base-T or 1000 Base-X using auto-media detect
- Console port (see [Chapter , Installing Ports, on page 41](#)): Supplied with console cable (straight-through Ethernet copper cable) and terminal adapter (DB-9 to RJ-45)

- Expansion slots that accept any combination of the following optional, high-capacity uplink modules: 10GbE XFP (two ports), 10GbE CX4 (two ports), 12G stacking (two ports) or 24G stacking (one port). See [Inserting Optional Modules \(10-Gigabit or Stacking\) on page 17](#) and [Connecting Stack Ports \(optional\) on page 25](#).

System Status

Chassis status information can be derived in several ways, including physical LED displays and boot menu options, both discussed here, along with CLI show commands, and SNMP traps. For details on those options, see the *Command Reference* and *Configuration Guide* for your software (FTOS or SFTOS).

LED Displays


As shown in [Figure 2-2 on page 9](#), the front panel of the switch contains several sets of LEDs:

- Stack ID: This is the LED at the far left of the front panel labeled “STACK ID”. See Stack ID in [Table 2-2 on page 12](#)). For more on stack unit numbering, see [Stacking on page 23](#).
- Status indicator LEDs on the left side of the front panel, to the right of the Stacking LED. See [Table 2-2](#).
- Each port has status indicator LEDs, described in [Table 2-1](#).

Table 2-1. Port LED Displays

Feature	Description
10/100/1000 Port LED*	Speed LED (left side of each port) Green — 1000M Amber — 100M Off — 10M Link/Active LED (right side of each port) Green — Link up on this port Blinking Green — Activity, transmitting or receiving packet at this port. Amber — Link up and power supplied on this port Off — No Link detected at this port
SFP Port LED*	Link/Activity LED Green — Link up on this port Blinking Green — Activity, transmitting or receiving packet in link up state Off — No Link detected at this port
XFP Port LED	Link/Activity LED (Each XFP port has a status LED on the module and in the Status Display at the left front of the switch) Green — Link up on this port Blinking Green — Activity, transmitting or receiving packet in link up state Off — No Link detected at this port

* The LEDs for a 10/100/1000 port numbered 45 through 48 are inactive if the shared SFP port (also labeled 45 through 48) is enabled.

 **NOTE:** As suggested by the footnote above, the fiber SFP ports have priority over the four 10/100/1000 ports with the same number.

The following table describes the LED status indicators on the left side of the front panel.

Table 2-2. Status Panel LED Display

Label	LED Color	Description
Left Side of the Status Panel		
OK	Green	Unit is online.
	Off	Unit is powered off.
	Green Blinking	Unit is booting up. (blinking rate is 16 Hz)
	Amber	Error during boot-up.
AC (on the S50V and S50N)	Green	Power supply is present and OK.
	Amber	Power supply is present but failed.
DC1 (on the S50N-DC)	Off	Power supply is not present.
XFP49*	Green	A valid 10G link is established on the port.
	Blinking Green	Transmitting or receiving packets on the port.
	Off	No link is established on the port.
XFP50*	Green	A valid 10G link is established on the port.
	Blinking Green	Transmitting or receiving packets on the port.
	Off	No link is established on the port.
STACK ID	Green	Indicates the stack ID (sometimes called "switch ID") of the unit.
		Starting with FTOS 7.8.1.0:
		<ul style="list-style-type: none"> • “A” is displayed to the left of the stack ID if the unit is a standalone or master (management) unit. • “B” is displayed for a standby unit. (Actually, it’s an 8, because of the limitations of the 7-segment LED.) • “0” is displayed next to the stack ID, as before, for the other units.
Right Side of the Status Panel		
Alarm	Amber	Minor alarm: Fan or temperature is operating outside parameters.
	Red	Major alarm
	Off	No alarm
DC (on the S50V and S50N)	Green	Power supply is present and OK.
	Amber	Power supply is present but failed.
DC2 (on the S50N-DC)	Off	Power supply is not present.
XFP51*	Green	A valid 10G link is established on the port.
	Blinking Green	Transmitting or receiving packets on the port.
	Off	No link is established on the port.
XFP52*	Green	A valid 10G link is established on the port.
	Blinking Green	Transmitting or receiving packets on the port.
	Off	No link is established on the port.

*The four XFP LEDs on the front panel also indicate the status when CX4 ports are installed in the bay.

Site Preparations

This chapter describes requirements and procedures to install your system in the following topics:

- [Site Selection](#)
- [Cabinet Placement on page 13](#)
- [Rack Mounting on page 14](#)
- [Fans and Airflow on page 14](#)
- [Power on page 14](#)
- [Storing Components on page 16](#)
- [Tools Required on page 16](#)

For detailed switch specifications, refer to [Chapter , Switch Specifications, on page 47](#).

 **NOTE:** Install the switch into a rack or cabinet before installing any optional components.

Site Selection

Make sure that the area where you install your switch meets the following safety requirements:

- Near an adequate power source. Connect the system to the appropriate branch circuit protection as defined by your local electrical codes. See cautions in [Information Symbols and Warnings on page 5](#).
- Environmental temperature between 32° – 122°F (0° – 50°C).
- Relative humidity that does not exceed 85% non-condensing.
- In a dry, clean, well-ventilated and temperature-controlled room, away from heat sources such as hot air vents or direct sunlight.
- Away from sources of severe electromagnetic noise.
- Positioned in a rack, cabinet, or on a desktop with adequate space in the front, rear, and sides of the unit for proper ventilation, and access.

Cabinet Placement

The cabinet must meet the following criteria:

- Minimum cabinet size and airflow are according to the EIA standard.
- Minimum of 5 inches (12.7 cm) between the side intake and exhaust vents and the cabinet wall.

Rack Mounting

When you prepare your equipment rack, ensure that the rack is earth ground. The equipment rack must be grounded to the same ground point used by the power service in your area. The ground path must be permanent.

Fans and Airflow

Ventilation is side-to-side, with six fans on the left side of the switch. For proper ventilation, position the switch in an equipment rack (or cabinet) with a minimum of five inches (12.7 cm) of clearance around the side intake and exhaust vents. When two S-Series systems are installed side by side, position the two chassis at least 5 inches (12.7 cm) apart to permit proper airflow. The acceptable ambient temperature ranges are listed in [Environmental Parameters on page 48](#).

As listed in [Table 2-2 on page 12](#), the front panels of the S50N and S50V series have an Alarm status LED, which is green when the switch is operating within required temperature parameters and all components are operating normally, including fans. The LED is amber when the temperature or components are outside expected parameters, red in a major alarm.

The fan speed increases when the temperature reaches 72 degrees C, and decreases to normal speed when the temperature falls to 57 degrees C. The switch never intentionally stops managing traffic.

SFTOS logs a temperature warning message when a temperature of 77 degrees C is reached, and logs another message when the temperature returns to normal. The Command Line Interface (CLI) also reports an alarm.

Use the show logging command to see the log messages. For details, see the System Logs chapters of the *SFTOS Command Reference* and *SFTOS Configuration Guide*.

In a stack, each unit has its own temperature monitoring and control. Status logging is identified by unit in the system log.

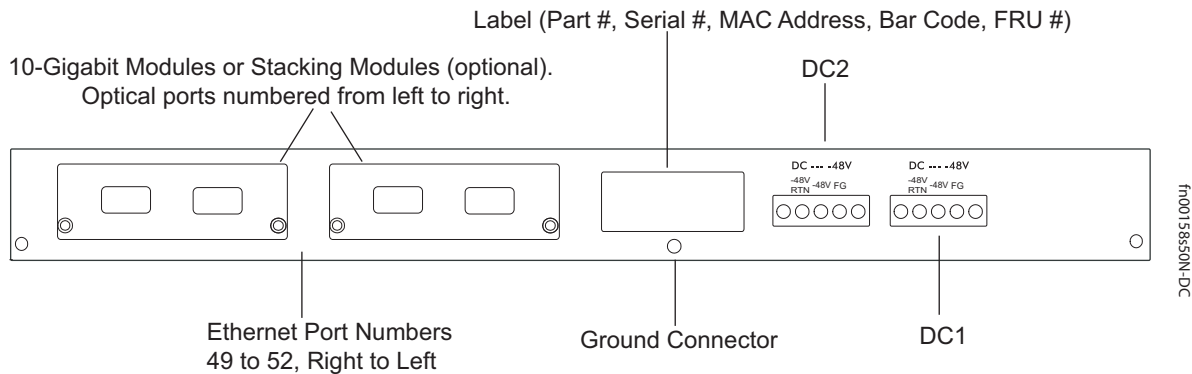
Fan replacement in the field is not offered as an option.

Power

S50N-DC

As shown below, the right side of the S50N-DC contains two terminal blocks for two 150W DC power supply inputs. The terminal blocks are labeled DC1 and DC2, which corresponds to the labels of the status LEDs on the front left of the switch. When both blocks are connected, they act in load-sharing mode with backup capability (one power supply can run the whole system).

Figure 3-1. The S50N-DC Rear View



S50N and S50V

CAUTION: The power supply cord is used as the main disconnect device; ensure that the socket-outlet is located/installed near the equipment and is easily accessible.

As shown in [Figure 2-2 on page 9](#), the rear of the S50N and S50V models have both an auto-sensing 110/220V AC receptacle and a standard -48V terminal-type DC connector. The rear of an S50N differs only in the arrangement of the lugs on its DC terminal block ([Figure 3-1](#)). Each system ships only with the AC power cord. There is no power switch. Connecting the switch to either an AC or DC power source starts the switch.

On both the S50N and S50V, either the AC or DC power supplies alone are sufficient to power the switch. When both AC and DC power supplies are connected, they act in roughly a 60%/40% load-sharing mode.

On the S50V, when the Dell Force10 470W DC Backup Power Supply is connected to the Current Sharing connection on the S50V DC terminal block, the switch uses the DC and AC power supplies in current-sharing (load-sharing plus additive) mode, so that the total capability is 470W+470W = 940W. See [Backup Power Components on page 29](#).

Dell Force10 also offers an external 180W DC power supply for the S50N and S50N-DC models, the same power supply used by the S50. However, the connections differ from those on the S50, so the power supply ships with DC cables to support each model. Rack-mounting hardware is supplied. For details on connecting to a power source, see [Supplying Power on page 27](#).

Power over Ethernet (PoE) Support

Along with the optional DC power supply noted above, the S50V includes an internal 470W power supply that supports both the operation of the switch and an independent power distribution system to supply power to the 48 copper Ethernet ports, supporting the IEEE 802.3af standard for Power over Ethernet (PoE). Connect only powered devices that adhere to IEEE 802.3af.

The total PoE power budget for the switch is between 320W and 790W, depending on the power sources available. If the external 470W Redundant Power Supply (catalog # S50-01-PSU-V) from Dell Force10 is attached to the Current Sharing terminal (see [Chapter , Installing Backup Power, on page 29](#)), you can use the power-budget command in FTOS to convert the power supply to current-sharing mode to provide up to 790W of PoE. When running SFTOS, use the inlinepower threshold command.

Each port can provide a maximum of 15.4W, subject to the power budget, voltage, power priority, and power limit settings. PoE is, by default, enabled globally on a first-come, first-serve basis, until it exceeds the total available power. Alternatively, the switch administrator can use the CLI to allocate power on a per-port and a per-stack-unit basis, with per-port power limits and port prioritization. For a brief introduction in this guide to the PoE commands, see [Connecting S50V Ethernet Ports with PoE on page 42](#). For details, see the PoE Commands sections in the *Command Reference* and *Configuration Guide* for your software.

Storing Components

If you do not install your system and components immediately, Dell Force10 recommends that you properly store the switch and all optional components until you are ready to install them.

⚠ WARNING: Electrostatic discharge (ESD) damage can occur when components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its accessories. After you remove the original packaging, place the switch and its components on an antistatic surface.

Follow these storage guidelines:

- Storage temperature should remain constant, in the range from -40° to 158° F (-40°C to 70° C).
- Storage humidity should be within 10 to 90% (relative humidity), non-condensing
- Store on a dry surface or floor, away from direct sunlight, heat, and air conditioning ducts.
- Store in a dust-free environment.

Tools Required

S-Series switches are shipped fully assembled, encased in foam. A utility knife is useful for cutting the packing tape, and a Phillips #2 screwdriver is required for attaching rack screws, and is also used for making some attachments, including DC cables and rear cover plates. Wear an anti-static guard, as noted above.

Installing the Switch

To install S50V or S50N systems, Dell Force10 recommends that you complete the installation procedures in the order presented in this chapter:

- [Inserting Optional Modules \(10-Gigabit or Stacking\)](#)
- [Installing the System on a Tabletop on page 18](#)
- [Installing the System in a Rack or Cabinet on page 19](#)
- [Stacking on page 23](#)
- [Supplying Power on page 27](#)

⚠ WARNING: As with all electrical devices of this type, take all the necessary safety precautions to prevent injury when installing this system. Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components. See other relevant cautions in the Preface.

Inserting Optional Modules (10-Gigabit or Stacking)

The **S50V** (catalog number S50-01-GE-48T-V) and **S50N** (catalog number S50-01-GE-48T-AC for AC-powered version of S50N; S50-01-GE-48T-DC for **S50N-DC**) have two expansion slots in the back of the chassis, for which there are four modules available:

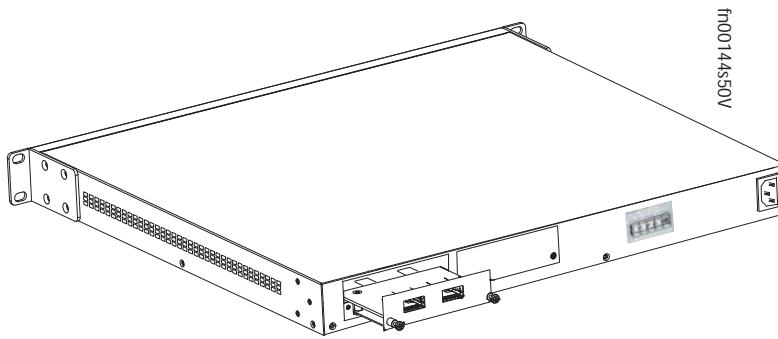
Module Description	Catalog Number
2-port 10GbE XFP (optical connection)	S50-01-10GE-2P
2-port 10GbE CX4 (copper connection)	S50-01-10GE-2C
2-port 12GbE Stacking	S50-01-12G-2S
1-port 24GbE Stacking	S50-01-24G-1S

The system supports any of the modules inserted in any combination of slots (although connecting all four ports of two 12G stacking modules is not supported, nor is connecting a 12G stack port in one switch to a 24G stack port in another switch). The ports are numbered 49 through 52, from left to right as you face the front of the chassis. So, for clarity in the use of the CLI in port assignment, if you are only using one XFP or CX4 module, insert it in the left-most expansion slot.

✎ NOTE: The 10G modules cannot be used for stacking. See [Connecting Stack Ports \(optional\) on page 25](#).

To install a module, follow the steps below:

Step	Task
1	<p>If the system is on, save the running configuration, if desired (and different from the startup configuration) with the command write memory. Then power down the system by unplugging it from its power source.</p> <p>CAUTION: Hot-swapping (inserting or removing) a module can crash and lock up the system, requiring a power cycle.</p>
2	<p>Use a #2 Phillips screwdriver to remove either a module faceplate or an existing module. Note that these slots, when used for 10G Ethernet ports, are assigned port numbers from left to right as you face the front of the system. So, for clarity in programming those ports, you might favor the left-most slot for the first 10G module that you install.</p>
3	<p>Grasp the module faceplate, and remove the module from its packaging, then slide it into the slot until the module faceplate is flush with the rear cover of the system.</p>



- 4 Secure the captive screws on either side of the module.
- 5 The optical XFP 10-Gigabit module (Catalog # S50-01-10GE-2P) requires additional XFP transceiver inserts, which are not included in the module kit. See [Installing XFPs on page 44](#) or the installation instructions that come with the transceiver.

CAUTION: You can connect a CX4 cable to an XFP port through a CX4 XFP converter (catalog number GP- XFP-1CX4) in the slot. However, an XFP port does not support the use of the cx4-cable-length command, discussed next.

CX4 module (catalog number S50-01-10GE-2C) ports do not require inserts. If you are installing a CX4 module, and you are connecting the ports with a cable substantially shorter or longer than 5 meters, use the cx4-cable-length command to set the signal strength. Use cx4-cable-length long for a longer cable, cx4-cable-length short for a shorter cable. For details when using FTOS, see the Interfaces chapter in the *FTOS Command Reference*. When using SFTOS, see the System Management Commands chapter in the *SFTOS Command Reference* for details.

NOTE: Take care not to connect CX4 ports to 12G stack ports in the switch. The receptacles and cables are the same, but they are incompatible. CX4 ports are labeled as such; stack ports are not labeled. You can order several cable lengths of each type; they are not part of the module kit. For details, see *Using CX4 Cables (CX4 Cable Matrix)* in the S-Series tech tips on iSupport: <http://www.force10networks.com/CSPortal20/KnowledgeBase/ToolTipsSSeries.aspx>

Installing the System on a Tabletop

The system can be positioned on a stable tabletop. Four rubber standoffs are provided for that purpose in the plastic bag in the switch shipping box. Keep the following in mind when using a tabletop:

- Ensure that your tabletop is stable and can handle the weight of the switch or a stack of switches, if that is the case, along with any added backup power supplies.
- Position the table for proper ventilation and easy access to separate power outlets for each device.

Installing the System in a Rack or Cabinet

The system provides three rack-mounting methods:

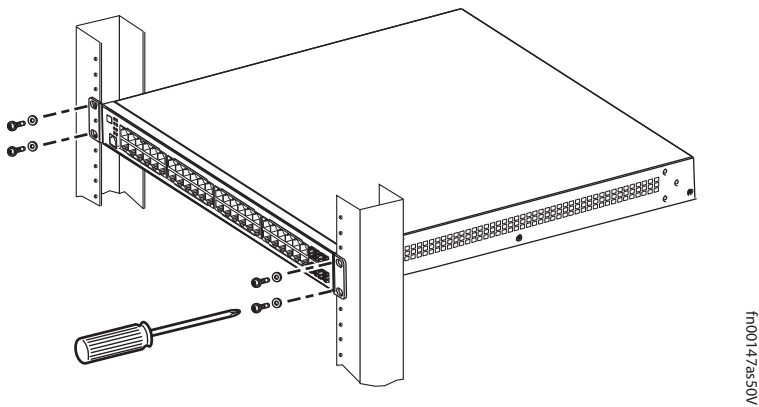
- [Two-Post Rack Mounting](#)
- [Four-Post Rack-mounting with Threaded Rails](#)
- [Four-Post Rack-mounting with Cage Nuts](#)

Two-Post Rack Mounting

The switch is shipped with the universal front-mounting brackets (rack ears) attached. Ensure that there is adequate clearance surrounding the rack to permit access and airflow. If you are installing two switches side-by-side, position the two chassis at least 5 inches (12.7 cm) apart to permit proper airflow.

Position the chassis in the rack. Secure the chassis with two of the supplied screws through each bracket and onto the rack post.

Figure 4-1. Two-post (Front-mounted) Rack-mounting

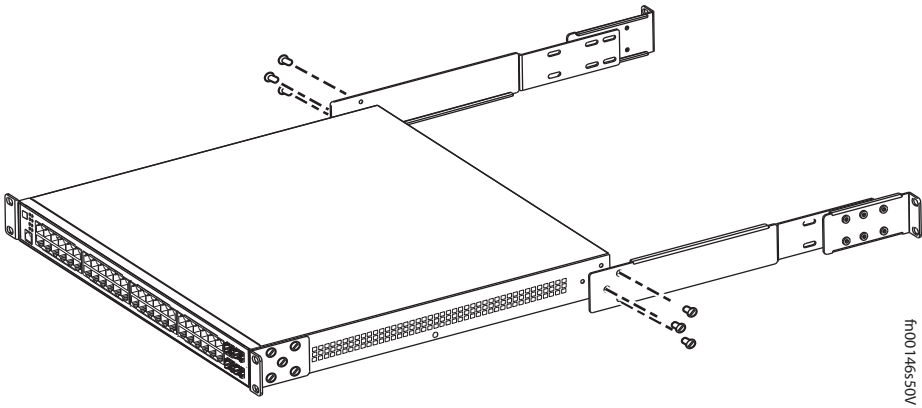


Four-Post Rack-mounting with Threaded Rails

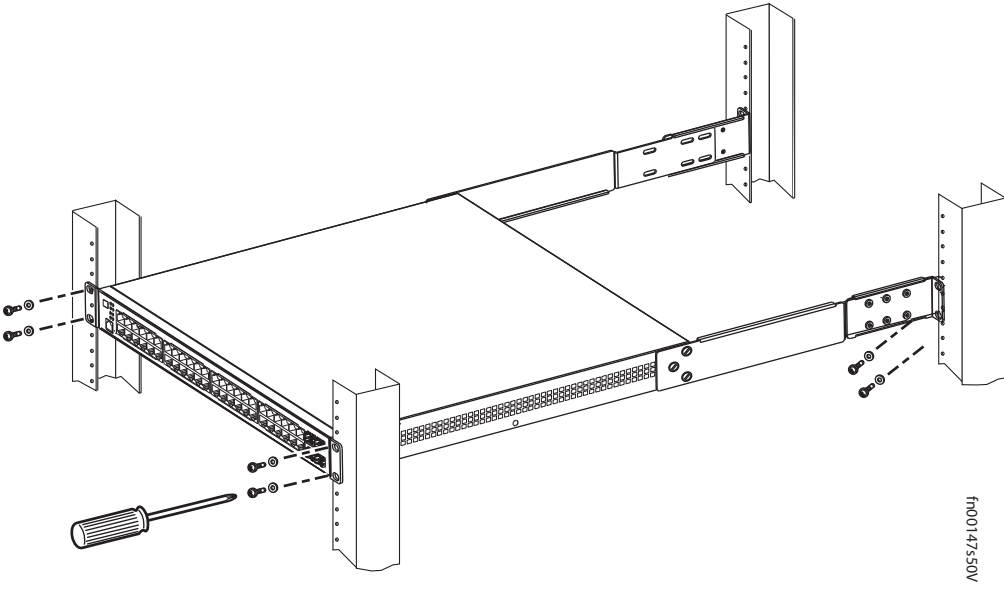
Ensure that there is adequate clearance surrounding the cabinet or rack to permit access and airflow. If you are installing two S-Series side-by-side, position the two units at least 5 inches (12.7 cm) apart to permit proper airflow. Follow the steps below to install a unit into a 4-post 19-inch equipment rack, using the attached front mounting brackets and the optional adjustable rear-mounting brackets.

Step	Task
------	------

- 1 Align the three screw holes of the adjustable rear mounting bracket with the three holes in the unit, and secure the mounting bracket with three screws.

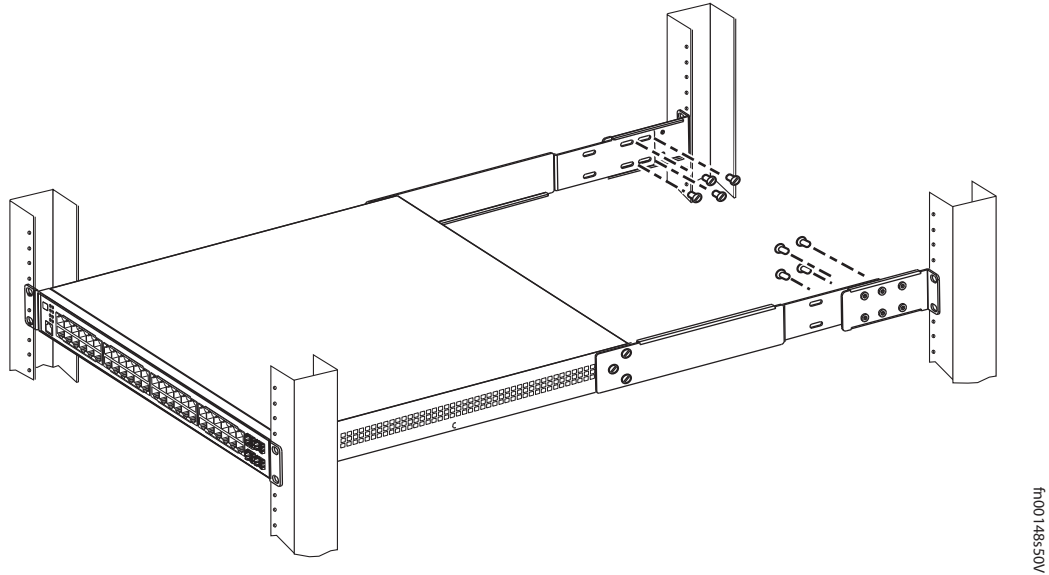


- 2 Insert the unit into the rack, and secure the chassis to the front post with two screws. Then secure it to the rear posts with two screws.



Step	Task
3	Set the adjustable rear mounting bracket to the length (one of three lengths) for your bracket. Secure the length with the four screws.

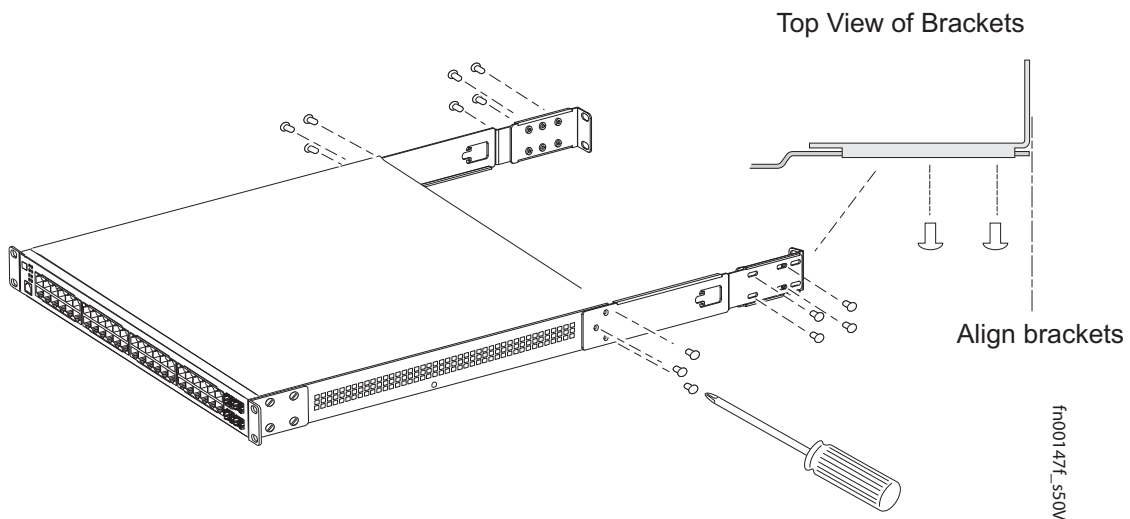
Figure 4-2. Four-post Rack-mounting with Adjustable Rear-mounting Brackets



Four-Post Rack-mounting with Cage Nuts

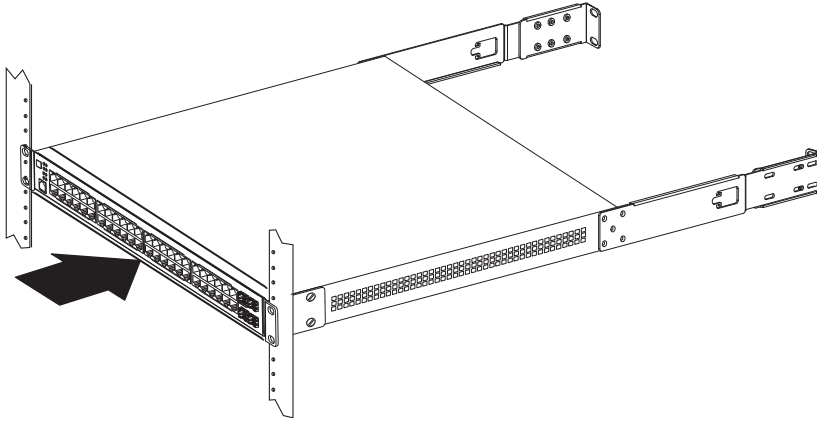
Ensure that there is adequate clearance surrounding the cabinet or rack to permit access and airflow. If you are installing two S-Series systems side-by-side, position them at least 5 inches (12.7 cm) apart. Follow the steps below to install the unit into a four-post rack mounting with cage nuts.

Step	Task
1	Attach the two rear brackets to the side panels. Align the three holes in the bracket with the three holes on the chassis, and secure the brackets to the chassis using the screws.



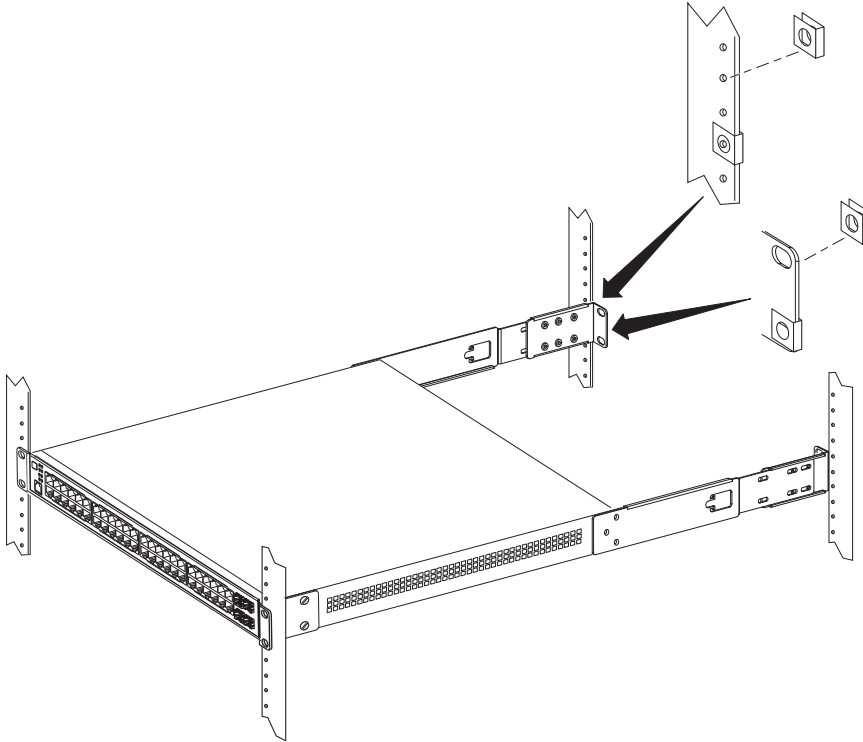
2 Align and secure the adjustable bracket onto the rear bracket.

Step	Task
3	Insert the chassis into the rear of the rack. Position and secure the chassis with two screws into each front bracket flange and into the rack post.



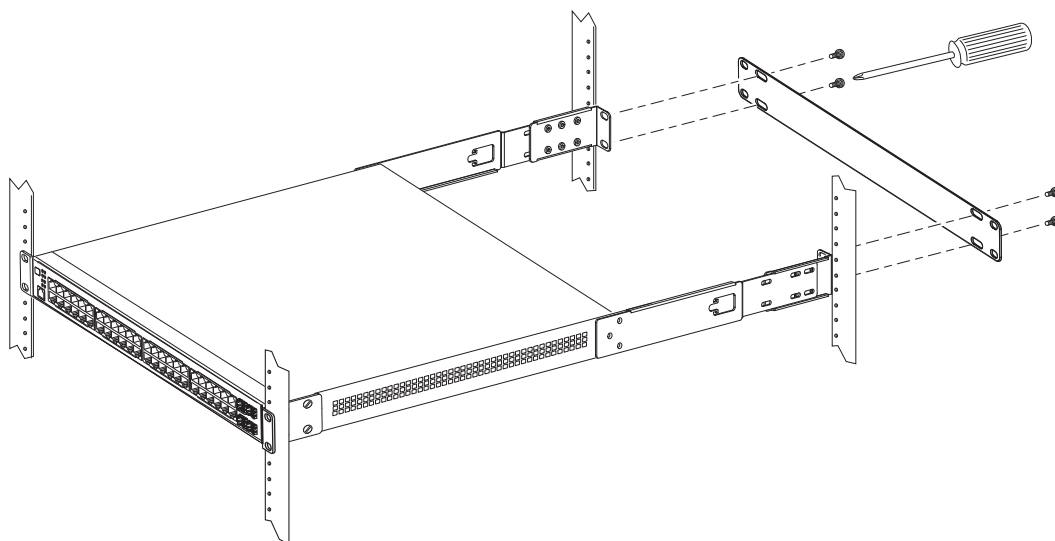
fn00147a_s50V(4post)

- 4 Position the cage nuts over the holes on each bracket flange and each rack post.



fn00147d_s50V

Step	Task
5	Align the rack filler panel to the rear bracket and rack posts. Secure by inserting two screws into the hole in the filler panel through to the holes in the rack post.



fn00147e_s50v

Stacking

You can add, remove, or swap units in an existing stack. The units in the stack can continue running as you add new units, but new units should be powered down during the connection.

All units in a stack must run the same version of the operating system. If you attempt to attach a unit with a different version of the operating system to an existing stack, the CLI will display an error, and the unit will not be added until you install compatible software.

The order in which the units come on-line or are added to or removed from the stack can affect how the stack identifies them, and how the units identify themselves, influencing unit numbers, management addresses, and other elements of the configuration file.

How units are identified within the stack is determined by the selected identification algorithm. The default algorithm has the units self-identify as Unit 1 through Unit [last] based on the order in which they come on-line. So, when setting up a new stack, you should have no trouble forcing the identification of the management unit and unit IDs by methodically supplying power to the units in your preferred sequence.

Similarly, when you add a brand new unit to the stack, the unit will be gracefully added as Unit [last] (the lowest unused number) with the current configuration.

If you have a pre-configured unit to add to the stack, but you want to make sure that the configuration does not override the configuration of the stack, it is best to add the unit while it is powered down, in order to avoid stack management conflicts.

Using SFTOS Stacking Commands

If the switch is running SFTOS, the commands available to manage stacking are described in the Stacking chapters of the *SFTOS Command Reference* and the *SFTOS Configuration Guide*.

You can execute clear config on the switch to start a clean configuration. Then pre-configure it, as recommended in Best Practices in the Stacking chapter of the *SFTOS Configuration Guide*.

You can use the SFTOS CLI to make stack identification changes on the fly:

- Renumber units: switch renumber
- Assign a new management unit: movemanagement
- Remove a unit from stack membership: no member

You can also use commands such as switch priority and member that override the default unit identification algorithms.

Use the show switch command to see the current assignment of the management unit.

Use the show switch *unit* command to see the serial number of the designated unit.

For details on and other stacking commands, see the Stacking chapter in the *SFTOS Configuration Guide* and the Stacking Commands chapter in the *SFTOS Command Reference*.

Using FTOS Stacking Commands

If the switch is running FTOS, the following commands are available to manage stacking:

- Use the stack-unit *unit* priority 1-14 command to configure the ability of an S-Series switch to become the management unit of a stack.
- Use the stack-unit *unit* provision {S25N|S25P|S25V|S50N|S50V} command to pre-configure a stacking ID of a switch that will join the stack. This is an optional command that is executed on the management unit.
- Use the stack-unit *unit* renumber *unit* command to renumber a standalone S-Series or any stack member except the management unit.
- Use the show system brief command to see the current assignment of the management unit.
- Use the show system stack-unit *unit* command to see the serial number of the designated unit and other system details.
- Use the show system stack-ports command to see the stacking topology and status.

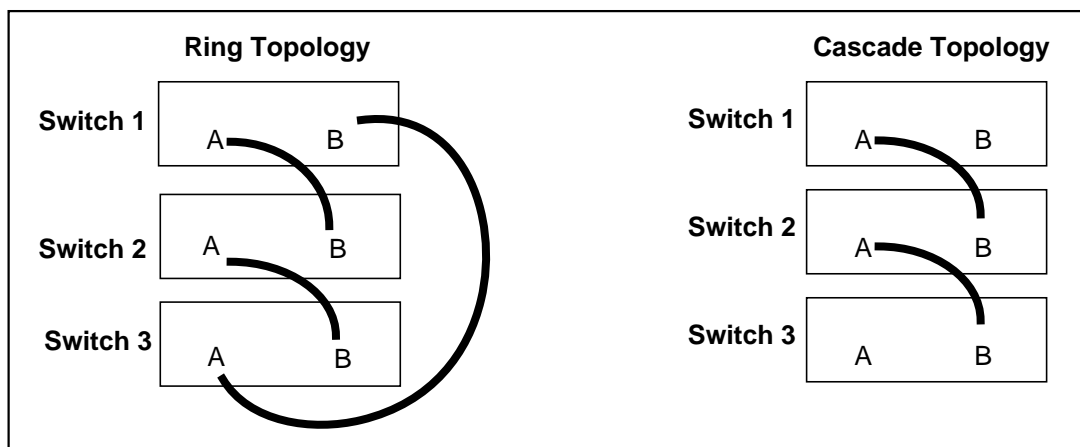
For details on using FTOS to remove a unit from a stack or use other stacking commands, see the Stacking Commands chapter in the *FTOS Command Reference* and the S-Series Stacking chapter in the *FTOS Configuration Guide*.

Connecting Stack Ports (optional)

The switch contains two expansion slots in the rear, in either of which you can insert stacking modules for converting the switch into a virtual slot in a single virtual switch, called a *stack*, comprised of any S-Series model running the same software. The S50V and S50N include two optional choices in stacking modules — a single-port 24G module and a two-port 12G module. You cannot interconnect the two types. If you use single-port 24G modules, you can insert one in each expansion slot to accomplish the ring topology.

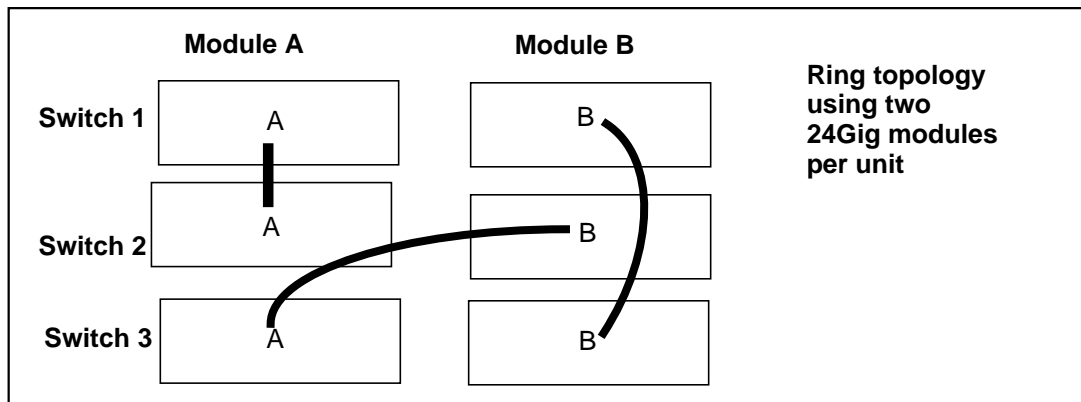
You can connect the switches while they are powered down or up. You can use either a ring topology or cascade topology connection (see [Figure 4-3](#)). Use the special stacking cables to connect them. Dell Force10 recommends that you mount the switches before you make your stack port connections.

Figure 4-3. Switch Stacking Topologies (showing dual-port modules)

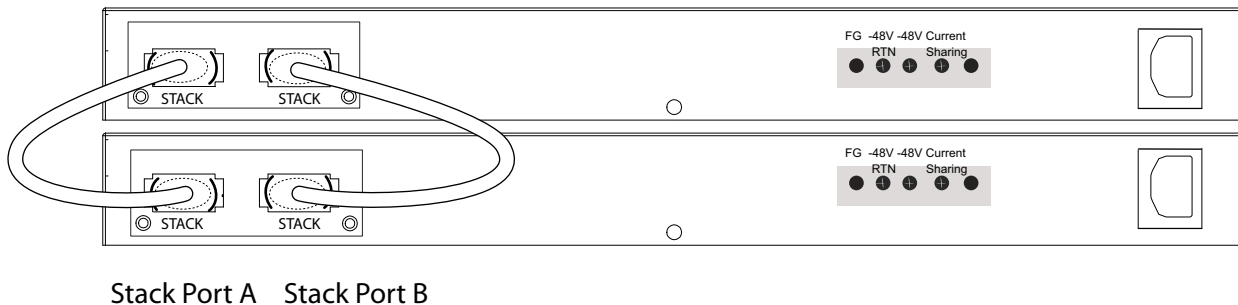


While the diagram, above, shows A-B port connections, the ports are bi-directional, so you can connect A to A and/or B to B, as shown below in examples of two-switch ([Figure 4-5](#)) and three-switch ([Figure 4-6](#)) ring topologies.

[Figure 4-4](#) shows the use of 24G stacking ports in each of the two rear modules to create a ring. Of course, this topology does not allow the use of any rear modules for XFP ports. A cascade topology, removing the stack port modules in the B slots of switches 1 and 2, would free those slots for use by XFP modules.

Figure 4-4. Stacking Topology Using 24G Single-port Modules**Connecting Two Switches**

Insert one end of the special stacking cable into a stack port, and insert the other end into a stack port of the adjacent switch. Optionally, insert a second cable into the other open stack port, as shown in [Figure 4-5](#). The second cable provides both backup connectivity and increased data transfer between the units.

Figure 4-5. Stack Ports of Two S50V Switches Connected in a Ring

fn00151525V1

NOTE: These diagrams and instructions use “Stack Port A” and “Stack Port B” for clarifying the connections, but the modules are not labeled.

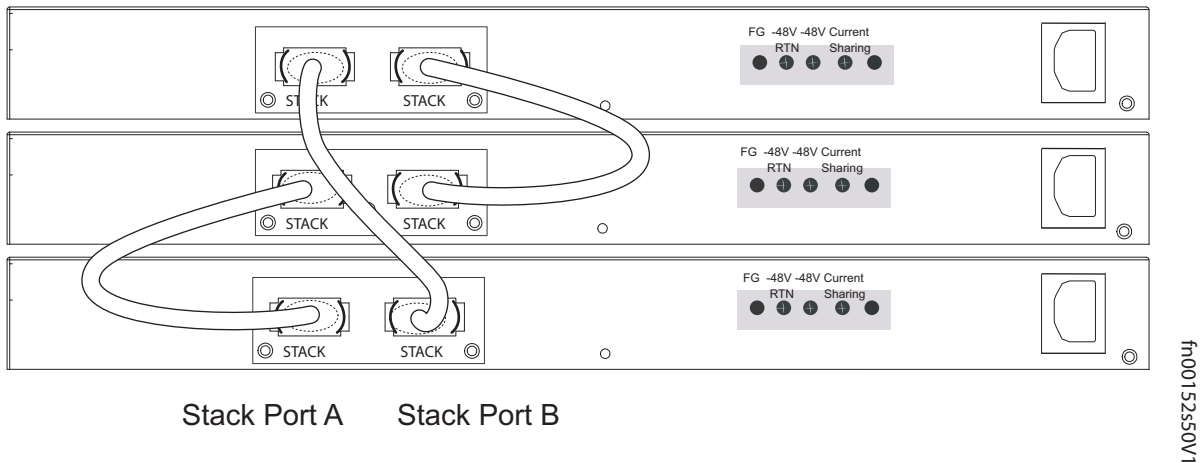
Connecting Three Switches

Dell Force10 recommends the ring topology, as outlined above ([Figure 4-3 on page 25](#)), for stacking S-Series switches, providing redundant connectivity. Using the example of three switches in the stack ([Figure 4-6](#)), and starting with the switch at the bottom of the stack:

- Insert one end of the first cable into Stack Port A.
- Insert the other end of the cable into Stack Port A of the middle switch.
- Insert the second cable into Stack Port B of the middle and top switches.

- Connect the remaining cable to the top and bottom switches by inserting one end of the cable into the open Stack Port B of the bottom switch and the other end of the cable into Stack Port A of the top switch.

Figure 4-6. S50V Rear View Showing Ring Topology Stacking



Supplying Power

Supply power to the switches in a stack only after they are mounted and the stack ports are connected. There is no on/off switch, and the stack members partly determined the stack management unit from the order in which they come on-line (see below).

The S50V and S50N switches have both AC (3-prong plug receptacle) and DC (-48V terminal-type) connections on the back of the unit (see [Figure 2-2 on page 9](#) and [Figure 3-1 on page 15](#)). They can use either power source independently or in combination, with the DC source in a backup mode (except for the 470W DC power supply, as noted in the section [Power on page 14](#)). In other words, you have three options for providing power to the switch — AC only, DC only, or using both AC and DC sources. If you select the third choice — AC and DC — the switch will only use the DC source after the AC source fails.

In addition, Dell Force10 provides, as an option, an external DC Redundant Power Supply Unit (PSU), which has an AC input and a cable for connecting the PSU to the DC terminal leads on the switch. To connect the switch to a DC power supply, refer to [Chapter , Installing Backup Power, on page 29](#). For PoE use, see [Connecting S50V Ethernet Ports with PoE on page 42](#).

For the S50V and S50N, to use AC only, connect the supplied AC power cord first to the switch (receptacle on the right as you face the rear of the chassis) and then to the power source (see [AC Power Requirements on page 48](#)). Connect the plug to the AC receptacle at the right rear of the switch, making sure that the power cord is secure.

S50N-DC

As shown in the section [Power on page 14](#) in the Site Preparation chapter, S50N-DC switches have two terminal blocks on the right side (instead of an AC receptacle) for two DC power supply inputs. The terminal block on the right, as you face the back of the chassis, is matched to the DC1 status LED on the

front left of the switch (see [Figure 2-2 on page 9](#)); the left block is matched to the DC2 status LED.

You must provide your own cables to connect to the power source. Cables must be sized for 11.5 A service at no more than -48VDC input (per NEC in the United States; internationally, follow local safety codes.). Before you make the cable connections, apply a coat of antioxidant paste to unplated metal contact surfaces. File unplated connectors, braided straps, and bus bars to a shiny finish.


- 1 Make sure that the remote power source (the circuit breaker panel) is in the OFF position.
- 2 Remove the safety cover from the DC terminal block.
- 3 Connect the grounding cable to the FG terminal first, then connect the opposite end to the appropriate grounding point at your site to ensure an adequate chassis ground.
- 4 Connect the -48 V and -48 V RTN (Return) cables to the switch terminals and then to the remote power sources, ideally on separate circuit breakers.
- 5 Replace the safety covers on the DC terminal blocks.
- 6 If you are connecting both terminal blocks, do not supply power until both terminal blocks are connected. You can supply power to either one or both. The S50N-DC does not set a precedence for either power source.


Installing Backup Power

This chapter covers the following topics:

- [Backup Power Components](#)
- [The Power Connections on the Switch on page 30](#)
- [Installing the Backup DC Power Supply for the S50V on page 30](#)
- [Inserting Tandem S50V PSUs into a Rack on page 31](#)
- [Connecting the S50V DC-to-DC Cable on page 32](#)
- [Installing the Backup DC Power Supply for the S50N on page 34](#)
- [DC Components on page 34](#)
- [Installing the External Power Shelf \(optional\) on page 35](#)
- [Inserting an S50N PSU into the EPS on page 36](#)

The S50V and S50N switches have both AC and DC power connections (S50N-DC has two DC terminal blocks, no AC). You can connect either one or both. When both are connected, the AC input is slightly preferred over the DC (about 60% / 40%). When you connect the Dell Force10 470W DC Power Supply Unit (PSU) to the Current Sharing terminal of the S50V, the AC and DC are in additive mode, totalling 940W.

 **NOTE:** Neither internal nor external S-Series power supplies are field serviceable. If an internal power supply fails, the switch must be replaced.

 **WARNING:** To prevent electrical shock, make sure the switch is grounded properly. If you do not ground your equipment correctly, excessive emissions can result. Use a qualified electrician to ensure that the power cables meet your local electrical requirements. See other relevant cautions in [Information Symbols and Warnings on page 5](#).

Backup Power Components

The optional Redundant Power Supply Unit (PSU) for the S50V supplies 470W DC, supporting both the switch itself and the PoE feature. The PSU kit includes:

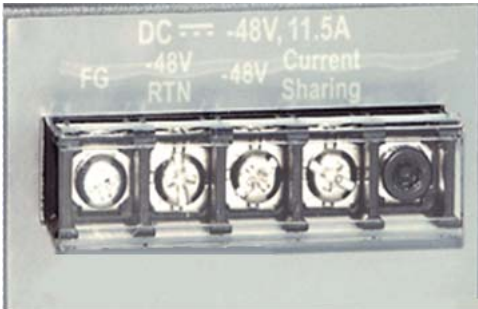
- The AC/DC rectifier (catalog number S50-01-PSU-V)
- DC-to-DC cable to connect the PSU to the switch
- AC cable to connect the PSU to the AC power source
- PSU mounting hardware: extended rack ears, twinning plate, screws, cage nuts, and four rubber feet that you can attach to the PSU if you want to set it on a table

The Power Connections on the Switch

The S50V and S50N contain both AC and DC connections. An AC cable is supplied with the switch (see [Supplying Power on page 27](#)). You can connect one or both of the AC or DC inputs to power. If both connections are made and able to supply power, the switch will use them in load-sharing mode.

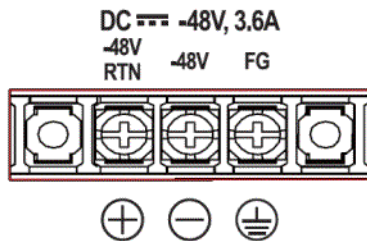
The DC input to the switch uses industry-standard terminal leads on a terminal block. The S50V has four connections — ground (FG), -48 volt input, return (RTN), and Current Sharing, as shown in [Figure 5-1](#):

Figure 5-1. DC Terminals on the S50V



The S50N has three DC connections — return (RTN), -48 volt input, field ground (FG) — from left to right.

Figure 5-2. DC Terminals on the S50N



The S50N-DC has two terminal blocks, each with the same three DC connections as the S50N.

⚠ WARNING: A qualified electrician should make the DC connections.

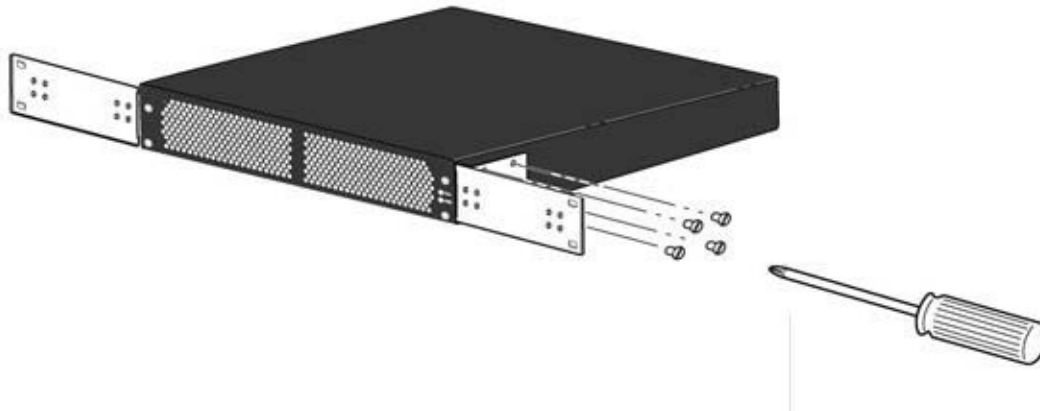
Installing the Backup DC Power Supply for the S50V

The Redundant Power Supply Unit (PSU) for the S50V is a 470W AC/DC rectifier. It includes rack-mounting hardware, an AC cable, and a cable to connect to the DC power leads on the S50V. The power supply is oversized to support the Power over Internet (PoE) feature, too large to install in the S50 External Power Shelf. Instead, to install the Redundant Power Supply in a rack, complete the steps below

for a single unit. For a tandem installation, see [Inserting Tandem S50V PSUs into a Rack on page 31](#).

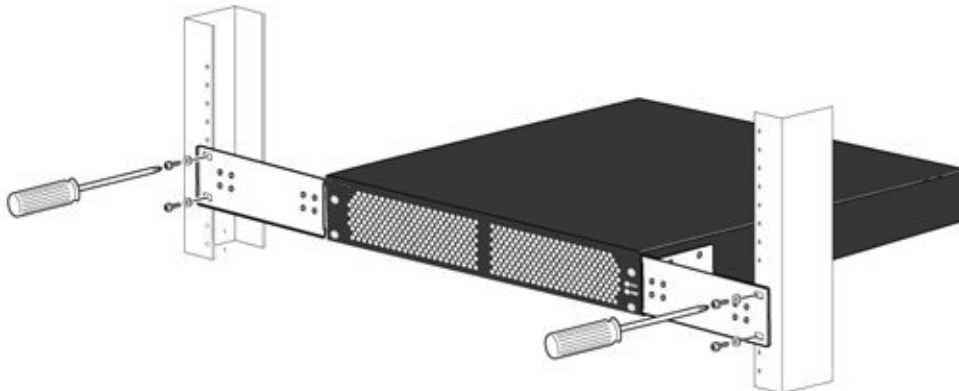
Step	Task
1	Using a #2 Phillips screwdriver, attach the short sides of the rack ears to the front corners of the power supply with the supplied screws.

Figure 5-3. Attaching Rack Ears to PSU



- 2 Insert the power supply into the rack and brace it temporarily in the rack so that the screw holes in the long sides of the rack ears are flush and align with the screw holes in the rack posts.
- 3 Secure the power supply on the left and right sides by tightening the supplied screws through the flanges to the side of the rack, as shown in [Figure 5-4](#). (Cage nuts are also supplied for racks that have mounting holes without threads.)

Figure 5-4. Mounting Single PSU in Rack



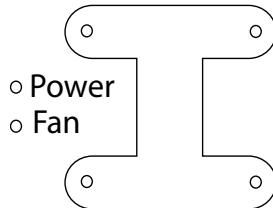
Inserting Tandem S50V PSUs into a Rack

To install two S50V PSUs (the 470W Redundant Power Supply) in tandem (side-by-side) in a rack, follow these steps:

Step	Task
1	Using a #2 Phillips screwdriver, attach the supplied extended rack ears to the outside, front sides of the two PSUs. As shown in Figure 5-6 , the long side of the rack ear is attached to the PSU, with the short side projecting at right angles away from the front corner of the PSU.

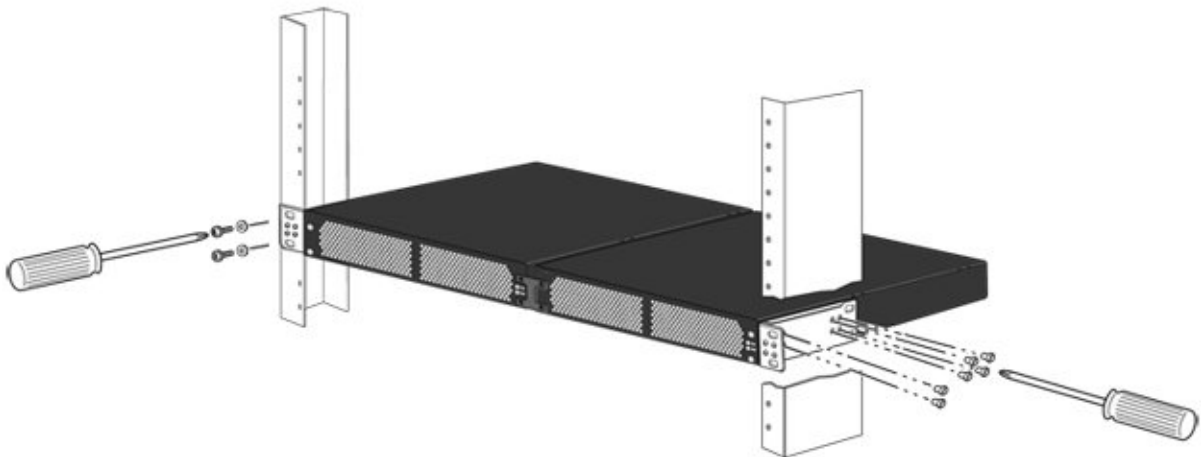
Step	Task
2	Join the two units with the supplied twinning plate (the small, flat, I-beam-shaped metal adapter with four screw holes), using two screws on each side of the plate through the front inside corners of the two switches. Orient the adapter with the cross-bars of the I-beam horizontally, so that the fan and power LEDs in the left-hand PSU are not obscured.

Figure 5-5. Twinning Plate Oriented over Two PSUs



- 3 As shown on the left side of [Figure 5-6](#), attach the rack ears to the rack with the supplied screws or cage nuts, depending on the style of your rack.

Figure 5-6. Two PSUs Mounted Side-by-Side



Connecting the S50V DC-to-DC Cable

The PSU kit for the S50V includes two power cables — the cable that connects the PSU to the AC source and the DC-DC cable that connects the PSU to the terminal block on the back of the S50V. The DC-DC cable length is 1.5 meter (5 feet), with a keyed plug connector at one end that connects to the PSU, and, at the other end, individual wires that connect to the DC terminal leads in the rear of the S50V ([Figure 5-7](#)).

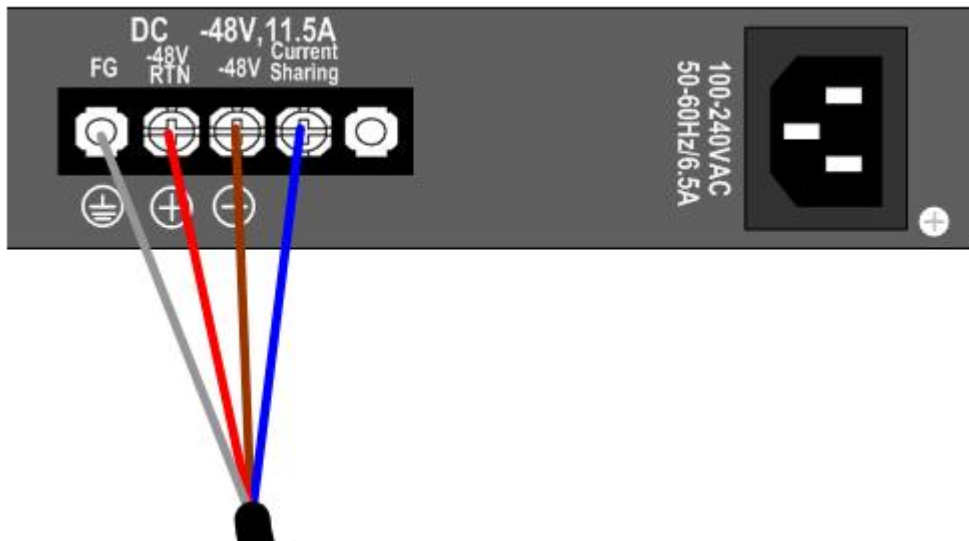
Figure 5-7. DC-DC Cable for S50V PSU



Follow the steps below to connect the S50V switch to the S50V external PSU.

Step	Task
1	<p>With the switch unplugged from AC power, connect the individual leads of the DC-to-DC cable to the DC terminal lugs of the switch (Figure 5-8), with a #2 Phillips screwdriver.</p> <p>Connect the gray wire to FG, red to RTN, brown to -48V. If you connect the blue lead of the Dell Force10 PSU to Current Sharing, you put the PSU in load-sharing mode, which helps to enable more PoE ports. Alternatively, leaving the wire unconnected puts the PSU in backup mode. The downside of selecting load-sharing mode is that, if either the AC or DC fails, all PoE functionality is lost.</p>

Figure 5-8. DC Terminals of the S50V Connected to the PSU Cable



CAUTION: Use only -48V DC. Using a higher voltage causes the DC source to take precedence over the internal AC PSU, causing the AC PSU to continually attempt to boot up. The symptom is a clicking noise.


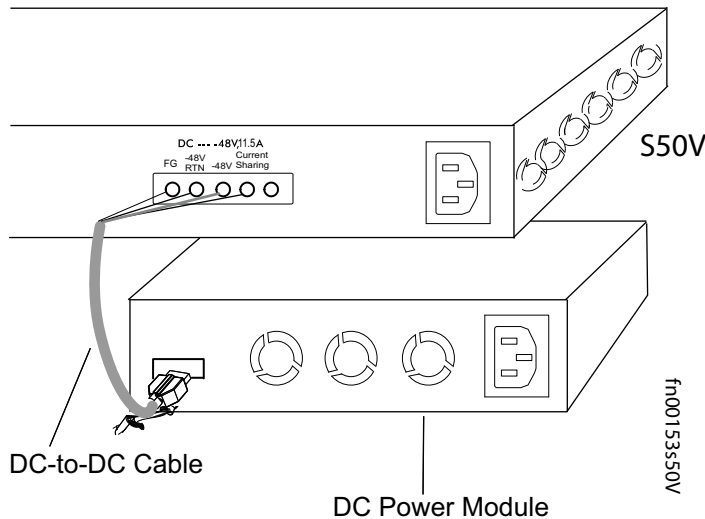
Step	Task
2	<p>Insert the plastic plug of the DC-to-DC cable into the receptacle on the lower left side of the DC Power Module (DPM), which is the bottom box in Figure 5-9.</p> <p>Note that one of the three leads on the plug has a trapezoidal key , which goes in the receptacle that is toward the center of the PSU. The key is not strong enough to resist being inserted in the opposite receptacle, and it is difficult to see, so you must take care to insert it correctly. To help you orient it, note that the top side of the plug has a knurled pattern.</p>

Figure 5-9. DC-to-DC Connection



- 3 Tighten the captive screws on the sides of the connector cable by turning them clockwise.
- 4 Insert the supplied AC-to-AC cable into the AC receptacle of the DC power supply. Ideally, you should connect that cable to an AC source separate from the AC connection made directly to the S50V.

Installing the Backup DC Power Supply for the S50N

The Redundant Power Supply Unit (PSU) for the S50N is a 180W AC/DC rectifier. It is less powerful than the S50V PSU, because it does not need to support PoE.

This 180W PSU is the same as used for the S50, so it can be housed in the External Power Shelf supplied for the S50. It does not have screw holes for rack ears, so it cannot be hung in a rack by itself.

CAUTION: Use only the power cords supplied with the power supply. Do not supply power to the system until the power supply and modules have been installed.

DC Components

- The External Power Shelf (EPS) (Catalog# SA-01-EPS)
- S50/S50N Power Supply Unit (PSU) (Catalog# SA-01-PSU), an external AC-to-DC rectifier
- PSU mounting hardware: captive screws for attaching the unit to the External Power Shelf (EPS)

- 5'(1.5m) DC-to-DC cable (two versions are included with the rectifier; see below.)
- AC cable to the rectifier

Installing the External Power Shelf (optional)

Installing the PSU in a rack requires the External Power Shelf (EPS) (Catalog# SA-01-EPS), shown in [Figure 5-10](#). It is a 2.5RU chassis that can house up to eight PSUs (for up to eight switches).

Figure 5-10. Front and Back Views of External Power Shelf (EPS)



Figure 5-11. EPS Mounting Bracket



Shown here on its side, the bracket (rack ear) used for front and rear mounting of the EPS has two holes at one end of the rack flange that are closer together than those at the other end.

When attached to the front corners of the EPS, the close-set holes are at the top on the left side of the EPS and at the bottom on the right side of the EPS.

To connect to the typical rack, you insert screws through the outside holes on the left-side flange and through the inside holes on the right-side flange.

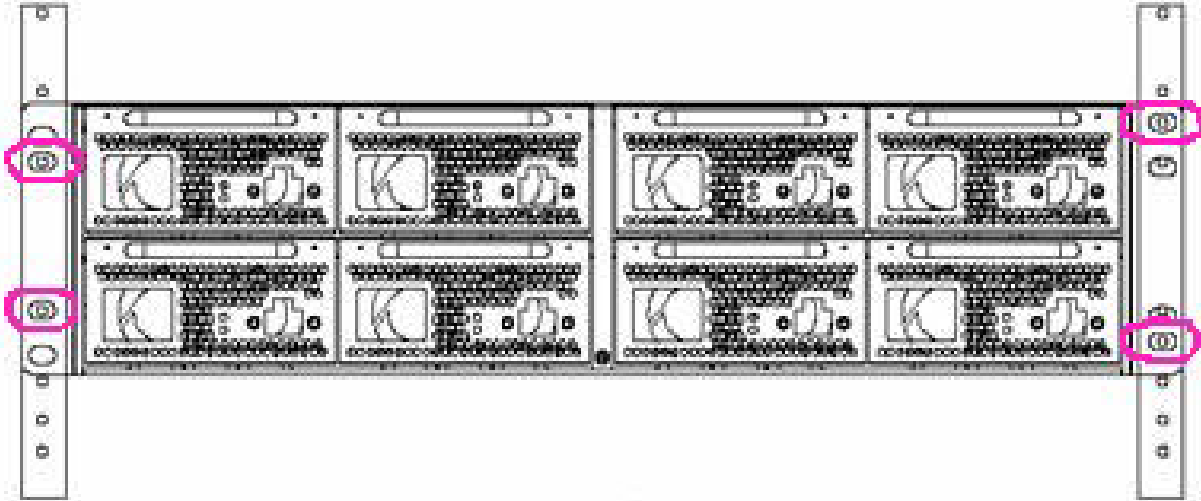
Procedure:

- 1 Attach the rack ears to the front or rear corners of the EPS, depending on where you are mounting it.
- 2 For front-mounting the EPC, slide the EPS into the rack from the front until the rack ears are flush with the rack posts. Then secure the EPS by tightening the supplied screws through its left and right rack ears. [Figure 5-12 on page 36](#) shows the EPS mounted below an S50.

For rear-mounting the EPC, slide the EPS into the rack from the rear until the rack ears are flush, and

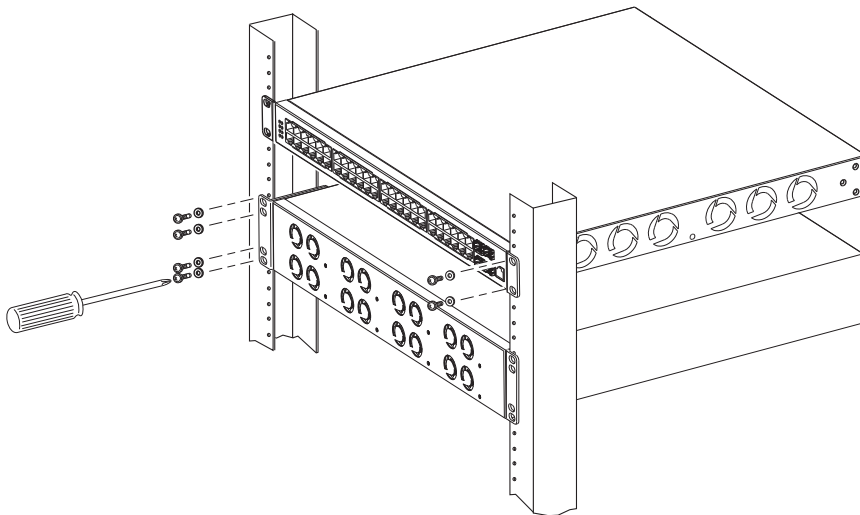
continue, as above. [Figure 5-12 on page 36](#) shows the typically-used screw hole locations circled in red.

Figure 5-12. EPS Rear-Mounted (shown fully populated with PSUs)



- 3 Insert a PSU into a bay of the PSE so that the captive screws align with the screw holes in the PSE, and then tighten the screws.

Figure 5-13. EPS Front-Mounted (shown below an S50)



fn00155550

Inserting an S50N PSU into the EPS

The Power Supply Unit (PSU) that supports both the S50 and S50N is an optional, external AC/DC rectifier that provides 180W DC at 48V.

Figure 5-14. Power Supply Unit (PSU) for the S50 and S50N (shown upside down to show standoffs)



To install the PSU into the External Power Shelf (EPS), follow these steps:

Step	Task
1.	Grip the PSU by the attached handle (at the top of the PSU).
2.	Slide the PSU into the bay until its front panel is flush with the shelf.
3.	Secure it by tightening the screws on the left and right sides of the PSU.

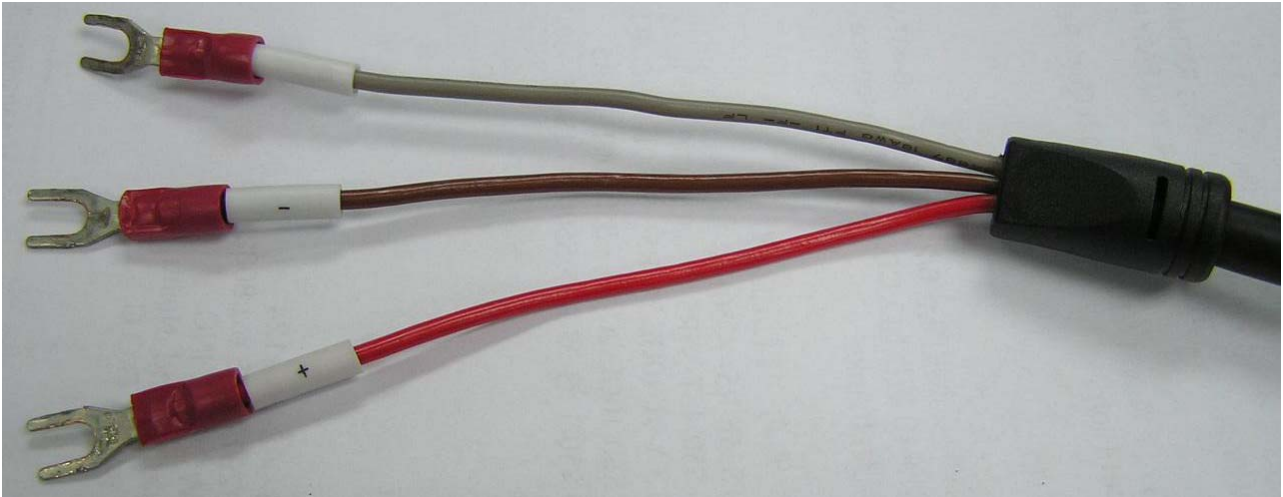
Connecting the DC-to-DC Cable for the S50N PSU

The PSU kit for the S50 and S50N includes an AC cable and two DC-DC cables. One DC-DC cable is for the PSU-S50 connection (it has a plastic plug for connecting to the S50). The other DC-DC cable, for connecting the PSU to the S50N, has, at the S50N end, three individual wires with fork connectors that connect to the DC terminal block in the rear of the S50N (see [Figure 5-15](#)).

In both cases (S50 and S50N), the DC-DC cable length is 1 meter (39 inches), with, at the end that connects to the PSU, a plastic plug containing two rows of three plastic connectors (see [Figure 5-14](#)).

NOTE: You can also attach PSUs to one or both of the terminal blocks of an S50N-DC. The connections are the same as to the S50N.

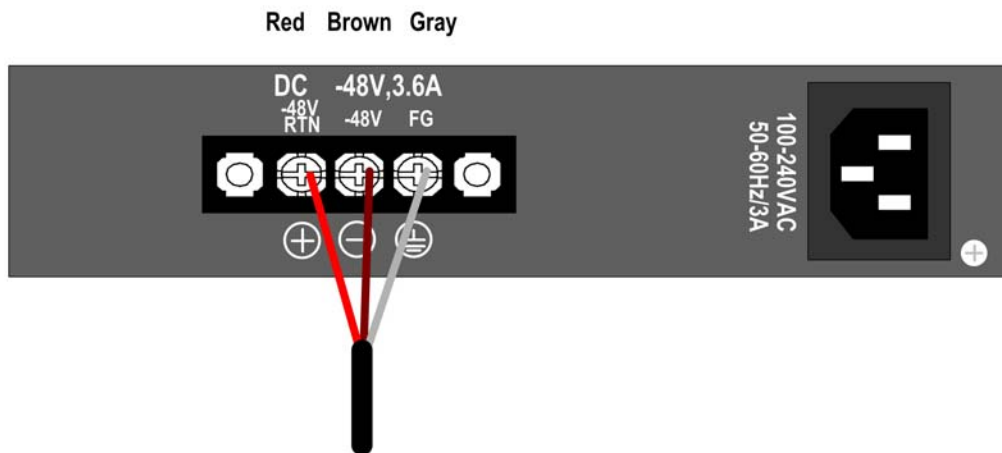
Figure 5-15. DC-DC Cable for S50N



Follow the steps below to connect the switch to the PSU:

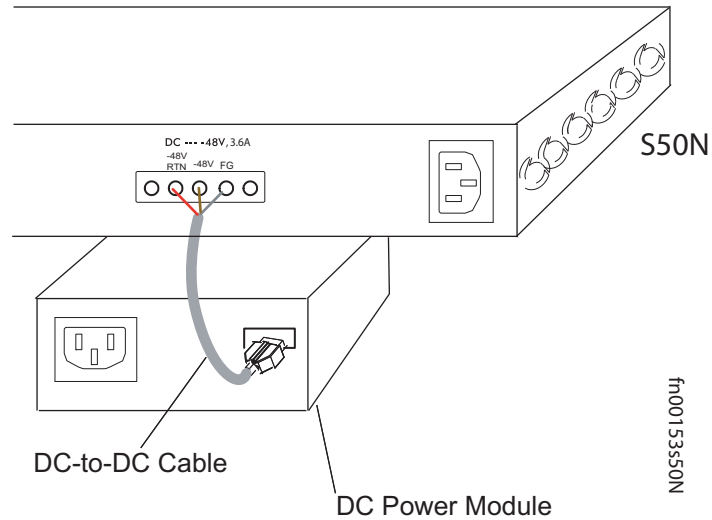
Step	Task
1	With the switch unplugged from AC power, connect the DC-DC plug to the switch. Connect the individual leads of the DC-to-DC cable to the DC terminal lugs of the S50N switch (Figure 5-16) using a #2 Phillips screwdriver. Connect the gray wire to FG (field ground), red to RTN, brown to -48V:

Figure 5-16. DC Terminals of the S50N Connected to the PSU Cable



Step	Task
2	Plug the other end of the DC-to-DC cable into the receptacle on the lower left side of the external PSU (Figure 5-9).

Figure 5-17. DC-to-DC Connection



- 3 Tighten the captive screws on the sides of the connector cable by turning them clockwise.
- 4 Insert your AC cable into the AC receptacle of the PSU. Ideally, you should connect that AC cable to an AC source separate from the AC connection made directly to the switch.

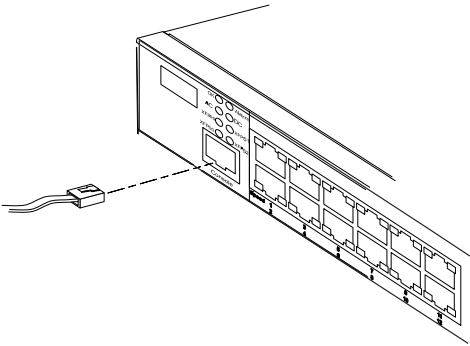
Installing Ports

This chapter contains these major sections:

- [Accessing the Console Port on page 41](#)
- [Connecting S50V Ethernet Ports with PoE on page 42](#)
- [Installing Optics on page 43](#)

Accessing the Console Port

Table 6-1.

<p>Connect the RJ-45/DB-9 adapter that is shipped with the S50V system to the RJ-45 cable.</p> <p>Console port pinout:</p> <p>Pin 1 = NC</p> <p>Pin 2 = NC</p> <p>Pin 3 = RXD</p> <p>Pin 4 = GND</p> <p>Pin 5 = GND</p> <p>Pin 6 = TXD</p> <p>Pin 7 = NC</p> <p>Pin 8 = NC</p>	<p>Figure 6-1. Console Port of S50V</p> 	<p>Set your initial console terminal settings to match the default console settings on the switch:</p> <ul style="list-style-type: none"> • 9600 baud rate • No parity • 8 data bits • 1 stop bit • No flow control (console port only) <p>After establishing a connection, you can modify the settings to match at each end of the connection.</p>
--	---	--

To access the console port, follow the procedure below.

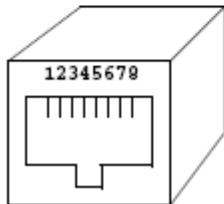
Step	Task
1	Install the RJ-45 copper cable that is shipped with the S50V system into the console port.
	<p>CAUTION: You must install a straight-through RJ-45 copper cable (a standard Ethernet cable) into the console port. This is different from many other implementations that require an Ethernet crossover cable (or rollover cable). If connecting to a terminal server and using a crossover cable, daisy chain another crossover cable to effectively get a straight-through cable connection. Many console terminal servers use octopus cables that are crossover cables. To accommodate the octopus cable, connect an additional crossover cable, as above, to effectively install a straight-through cable.</p>
2	If necessary, connect the RJ-45/DB-9 adapter that is shipped with the S50V system to the end of the RJ-45 cable that will connect to your terminal.
3	Verify that your terminal default settings match the default settings, as listed above, on the console port:

Step	Task (continued)
4	<p>If you use the console port to download software to the switch, you should raise the console baud rate. If SFTOS is installed, establish a connection with the default settings to verify the connection. Then use the lineconfig command to access the Line Config mode, and use the serial baudrate command to raise the baud rate on the console port. Match the settings in your terminal access program.</p> <p>If FTOS is installed, to make other console port configuration changes, such as setting the console port timeout or setting up access security, use the line console command in the CONFIGURATION mode.</p>

Connecting S50V Ethernet Ports with PoE

The copper ports (1 through 48) in the S50V are enabled by default to deliver power to connected powered devices that follow the IEEE 802.3af specification for Power over Ethernet (PoE). For delivering PoE, use the same Cat. 5 cables and RJ-45 connectors that you use for non-PoE connections. The PoE pinout is shown in [Figure 6-2](#).

Figure 6-2. RJ-45 PoE Pinout



Conductor	Alternative A (MDI-X or Auto-MDI-X which default to MDI-X)
1	Negative V_{Port}
2	Negative V_{Port}
3	Positive V_{Port}
4	
5	
6	Positive V_{Port}
7	
8	

The internal AC 470 watt power supply will limit PoE power to 320 watts if the switch requires power for other uses, and the default PoE configuration limits PoE power to 288 watts. As described in [Power over Ethernet \(PoE\) Support on page 15](#), you can raise that limit with an external power supply running in load-sharing mode and with certain FTOS and SFTOS commands. The PoE commands of FTOS and SFTOS are summarized here.

NOTE: For details on commands that control PoE, see the PoE chapters of the *Configuration Guide* and *Command Reference* for your software.

Table 6-2. PoE Commands

FTOS	SFTOS
[no] power-budget stack-unit 0-7 321-790: (CONFIGURATION mode) Enable PoE power from a 470W Redundant Power Supply (catalog # S50-01-PSU-V), if attached to the designated stack member.	inlinepower {disable enable} unit-id: (Global Config mode) Enable or disable PoE for a specified switch in an S-Series stack. inlinepower admin {off auto}: (Interface Config mode) Enable or disable PoE on a particular port.
[no] power inline {auto [max_milli-watts] static [max_milli-watts]}: (INTERFACE mode) Enable power to be supplied to a device connected to a port	inlinepower limit 1-20: (Interface Config mode) Set a power limit on the port.
[no] power inline priority {critical high low}: (INTERFACE mode) Set the PoE priority of the port.	inlinepower priority {critical high low}: (Interface Config mode) Set a PoE priority on the port.
show power inline: (EXEC, EXEC privilege modes) Display the ports that are enabled with PoE and the amount of power that each is consuming	inlinepower threshold 0-100 unit-id: (Global Config mode) Override the 80% default limit of the PoE power budget.
show power supply: (EXEC, EXEC privilege modes) Display the power supply status.	show inlinepower [unit/slot/port all]: (User Exec, Privileged Exec modes) Display the power status for one or all ports.

Installing Optics

This section contains two subsections:

- [Installing SFPs on page 43](#)
- [Installing XFPs on page 44](#)

The S50N and S50V each have four receptacles at the right end of their faceplates that accommodate 10/100/1000 SFP optical transceivers.

On the back of the switches, there are two bays that accept either stacking modules or 10GbE modules (CX4 or XFP). A 10GbE module contains two ports. 10GbE modules should only be inserted or removed when the switch is powered down, as detailed in [Inserting Optional Modules \(10-Gigabit or Stacking\) on page 17 in Chapter 4, Installing the Switch](#).

SFP and XFP transceivers can be inserted or removed while the switch is running.

CAUTION: Before connecting a transceiver to a source, check the receive power of the transceiver with an optical power meter. Generally, Dell Force10 specified optics are not to be subjected to receive power higher than that stipulated by the optic specification. If the optic is exposed to optical power in excess of the specification, there is a high likelihood that it will be damaged. Optical specifications for Dell Force10 branded devices are at the following URL: <http://www.force10networks.com/products/mediaspecifications.asp>

Dell Force10 offers various types of SFP and XFP transceivers. For details, see: <http://www.force10networks.com/products/specifications.asp>

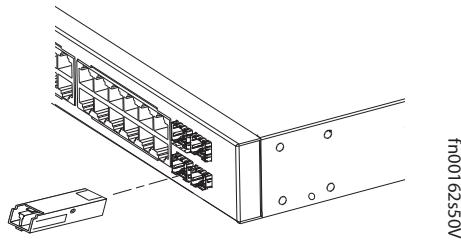
Installing SFPs

To install an SFP transceiver into an open optical port at the right front of the switch, use the steps below:

⚠ WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components.

Step	Task
1	Position the SFP so it is in the upright position. (The SFP has a key that prevents it from being inserted incorrectly.)
2	Insert the SFP into the port until it gently snaps into place.

Figure 6-3. Front View of S50V with SFP



Installing XFPs

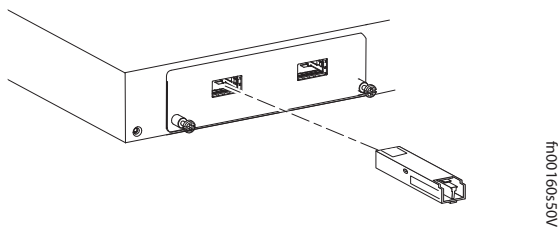
To install an XFP into one of the two ports in the optional 10GbE optical module (see [Inserting Optional Modules \(10-Gigabit or Stacking\) on page 17](#)) on the back of the switch, follow the procedure below:

⚠ WARNING: Electrostatic discharge (ESD) damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and its components.


⚠ WARNING: Do not look directly into any optical port. Failure to follow this warning could result in physical harm. For details, see [Information Symbols and Warnings on page 5](#).

Step	Task
1	Position the XFP so it is in the upright position. (The XFP has a key that prevents it from being inserted incorrectly.)
2	Insert the XFP into the port until it gently snaps into place.

Figure 6-4. Rear View of S50V with XFP



⚠ CAUTION: You can insert and connect XFP transceivers while the switch is operating. You can also disconnect and remove XFP transceivers while the switch is operating. However, inserting or removing the module is not supported; it can crash or lock up the switch, requiring a reboot.

 **CAUTION:** The CX4 module does not use transceivers. However, you can use a CX4 cable with an XFP port by inserting a CX4 XFP converter (catalog name GP- XFP-1CX4) into the slot. An XFP port does not support the use of the `cx4-cable-length` command. For details, see [Inserting Optional Modules \(10-Gigabit or Stacking\) on page 17](#).


For enabling ports with FTOS, see the *FTOS Configuration Guide*.

With SFTOS, see the *SFTOS Configuration Guide* or the *S50V and S50N Quick Reference*.

Switch Specifications

This chapter contains these sections:

- [Chassis Physical Design](#)
- [Environmental Parameters on page 48](#)
- [Power Requirements on page 48](#)
- [Agency Compliance on page 49](#)

 **NOTE:** The specifications in this chapter, unless otherwise noted, pertain to the S50V (catalog # S50-01-GE-48T-V) and S50N (catalog # S50-01-GE-48T-AC for AC-powered version of S50N; catalog # S50-01-GE-48T-DC for S50N-DC).

Chassis Physical Design

Parameter	Specifications
Weight (weight with factory-installed components)	14.41 pounds (approx.) (6.54 kg)
Height	1.73 inches (4.4 cm)
Width	17.32 inches (44 cm) (19" rack-mountable)
Depth	16.73 inches (42.5 cm) (standard 1 rack unit – 1RU)
Rack clearance required	Front: 5 inches (12.7 cm) Rear: 5 inches (12.7 cm)

Environmental Parameters

Parameter	Specifications
Temperature	Operating: 32° to 122°F (-0° to 50°C) Non-operating (storage temperature): -40° to 158°F (-40° to 70°C)
Maximum Thermal Output	S50N: 531 BTU/Hour S50N-DC: 465 BTU/Hour S50V: 497 BTU/Hour
Maximum altitude	No performance degradation to 10,000 feet (3,048 meters)
Relative humidity	10 to 85% non-condensing
Shock	Designed to meet MIL-STD-810
Vibration	Telcordia GR-63-CORE
ISO 7779 A-weighted sound pressure level	S50N: 42.0 dBA at 73.4°F (23°C) S50V: 62.2 dBA at 73.4°F (23°C)


Power Requirements

AC Power Requirements

Parameter	Specifications
Nominal input voltage	100 – 240 VAC, 50/60 Hz
Maximum current draw	6.5 A @ 115 VAC 3.25 A @ 200/240 VAC
Maximum power consumption	S50N: 156W S50N-DC: 136 W S50V: 146W
Maximum PoE power	320W for PoE using either AC or DC inputs 790W for PoE using load-sharing AC and DC inputs

DC Power Requirements

Parameter	Specifications
Nominal input voltage	-48V to -54Vz
Maximum current draw	S50N-DC: 3.6 A at -48 VDC S50V: 11.5 A @ -48VDC
Maximum system power consumption	S50V: 470W (790W using current-sharing AC and DC inputs) S50N: 102W S50N-DC: 136W

 **NOTE:** The S50N and S50V switches contain a lithium battery. The switch contains no user-serviceable parts. For details on recycling the switch or any of its components, see [Product Recycling and Disposal on page 52](#).

Agency Compliance

The S50N and S50V are designed to comply with the following safety and agency requirements.

USA Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designated to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance to the instructions, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures necessary to correct the interference at their own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Dell Force10 is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications in the equipment. Unauthorized changes or modification could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communication Statement

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.


Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Union EMC Directive Conformance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Dell Force10 cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of this product, including the fitting of non-Dell Force10 option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/ European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

 **WARNING:** This is a Class A product. In a domestic environment, this device may cause radio interference, in which case, the user may be required to take adequate measures.

European Community Contact

Dell Force10, EMEA - Central
Dahlienweg 19
66265 Heusweiler
Germany

<http://www.force10networks.com/german/>

Tel: +49 172 6802630

Email: EMEA Central Sales

Japan: VCCI Compliance for Class A Equipment

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is Class A product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

⚠ WARNING: AC Power cords are for use with Dell Force10 equipment only. Do not use Dell Force10 AC power cords with any unauthorized hardware.

本製品に同梱いたしております電源コードセットは、本製品専用です。本電源コードセットは、本製品以外の製品ならびに他の用途でご使用いただくことは出来ません。製品本体には同梱された電源コードセットを使用し、他製品の電源コードセットを使用しないで下さい。

Korea (MIC certification)

Korean Class A Warning Statement


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Korea Certification

A급 기기
(업무용 방송통신기자재)

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Korea Information

	 <i>[equipment type]</i>
품명(Product Name)	Ethernet Switch
모델명(Model)	<i>[model number]</i>
신청인(Applicant)	Force10 Networks, Inc.
제조사(Manufacturer)	Delta Networks, (Dongguan) Ltd.
제조년월(Manufacturing Date)	<i>[date]</i>
제조국(Country of Origin)	China

Safety Standards and Compliance Agency Certifications

- CUS UL (60950-1, 1st Edition)
- CSA 60950-1-03, 1st Edition
- EN 60950-1, 1st Edition
- EN 60825-1, 1st Edition
- EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification Requirements and User's Guide
- EN 60825-2 Safety of Laser Products—Part 2: Safety of Optical Fibre Communication Systems
- FDA Regulation 21CFR 1040.10 and 1040.11
- IEC60950-1 1st Ed including all National Deviations and Group Differences

Electromagnetic Compatibility (EMC)

Emissions

- Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A
- Canada: ICES-003, Issue-4, Class A
- Europe: EN55022 2006 (CISPR 22: 2006), Class A
- Japan: VCCI V3/ 2007.04 Class A
- USA: FCC CFR47 Part 15, Subpart B, Class A

Immunity

- EN 300 386 v1.3.3: 2005 EMC for Network Equipment
- EN 55024 1998 + A1: 2001 + A2: 2003
 - EN 61000-3-2 Harmonic Current Emissions
 - EN 61000-3-3 Voltage Fluctuations and Flicker
 - EN 61000-4-2 ESD
 - EN 61000-4-3 Radiated Immunity

- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 Low Frequency Conducted Immunity

Product Recycling and Disposal

This switch must be recycled or discarded according to applicable local and national regulations. Dell Force10 encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Dell Force10 offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products.

Waste Electrical and Electronic Equipment (WEEE) Directive for Recovery, Recycle and Reuse of IT and Telecommunications Products

Dell Force10 switches are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label, as shown in [Figure 7-1 on page 52](#) is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Figure 7-1. The European WEEE symbol



In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE.

Dell Force10 products, which fall within the scope of the WEEE, are labeled with the crossed-out wheeled-bin symbol, as shown above, as required by WEEE.

For information on Dell Force10 product recycling offerings, see the WEEE Recycling instructions on iSupport at: <http://www.force10networks.com/CSPortal20/Support/WEEEandRecycling.pdf>.

For more information, contact the Dell Force10 Technical Assistance Center (TAC) (see [Contacting the Technical Assistance Center on page 56](#)).

Notice to Recyclers

To open the case:

- 1 Remove the small phillips screws that connect the top to the body. There should be three evenly spaced across the rear and three evenly spaced along each side.

- 2 Slide the top backwards until its front flange slides free of the faceplate, then lift it off.

To remove the lithium closed-cell clock battery (clearly visible towards the right rear of switch):

- 1 Insert a small, flat screw driver blade under the battery and in one of the slots of the plastic retainer underneath the battery.
- 2 Lever the battery up against the coin cell clip (the hold-down lead on top of the battery) far enough to provide room for the battery to be lifted above the edge of its retainer, as shown in this photograph.



Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and treatment of batteries and accumulators.

Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local Dell Force10 representative.

Figure 7-2. The European WEEE symbol



For California:

Perchlorate Material — Special handling may apply.

See: <http://www.dtsc.ca.gov/hazardouswaste/perchlorate>

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials.

Technical Support

This appendix contains these major sections:

- [The iSupport Website](#)
- [Contacting the Technical Assistance Center on page 56](#)
- [Locating Serial Numbers on page 56](#)
- [Requesting a Hardware Replacement on page 57](#)

The iSupport Website

iSupport provides a range of documents and tools to assist you with effectively using Dell Force10 equipment and mitigating the impact of network outages. Through iSupport you can obtain technical information regarding Dell Force10 products, access to software upgrades and patches, and open and manage your Technical Assistance Center (TAC) cases. Dell Force10 iSupport provides integrated, secure access to these services.

The iSupport website contains a publicly available interface that includes access to techtips, white papers, and user manuals. After you get an account and log in, the available documentation expands to other types, including bug lists, error message decoder, release notes. You can even track your own Dell Force10 inventory.

Accessing iSupport Services

The URL for iSupport is <http://www.force10networks.com/support/>. To access iSupport services you must have a userid and password. If you do not have one, you can request one at the website:

- 1 On the Dell Force10 iSupport page, click the **Account Request** link.
- 2 Fill out the User Account Request form, and click **Send**. You will receive your userid and password by E-mail.
- 3 To access iSupport services, click the **LOGIN** link, and enter your userid and password. See [Contacting the Technical Assistance Center](#), below, for more.

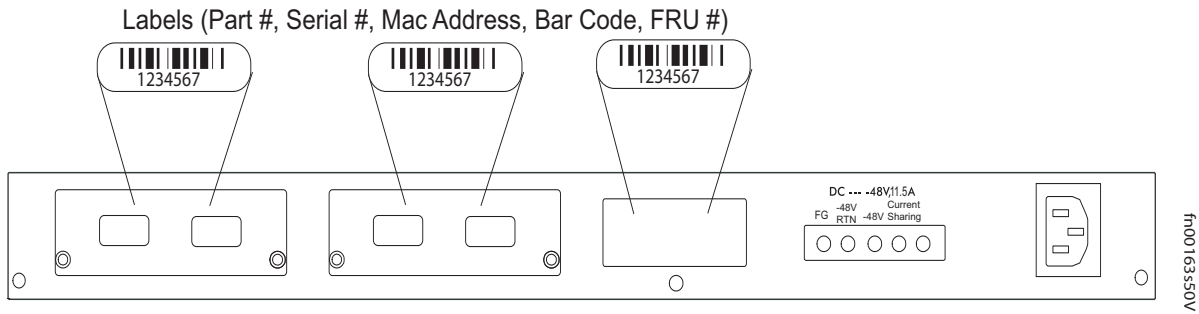
Contacting the Technical Assistance Center

How to Contact Dell Force10 TAC	Log in to iSupport at http://www.force10networks.com/support/ , and select the Service Request tab.
Information to Submit When Opening a Support Case	<ul style="list-style-type: none"> • Your name, company name, phone number, and E-mail address • Preferred method of contact • Model number • Serial Number (see Locating Serial Numbers on page 56) • Software version number • Symptom description • Screen shots illustrating the symptom, including any error messages. These can include: <ul style="list-style-type: none"> • Output from the show tech-support [non-paged] command (This report is very long, so the storage buffer in your terminal program should be set high.) • Output from the show logging eventlog [unit] command, where unit is the stack ID of the member unit that experienced the failure (This report is included as a section in the output of show tech-support.) • Console captures showing the error messages • Console captures showing the troubleshooting steps taken • Saved messages to a syslog server, if one is used
Managing Your Case	Log in to iSupport, and select the Service Request tab to view all open cases and RMAs.
Downloading Software Updates	Log in to iSupport, and select the Software Center tab.
Technical Documentation	Log in to iSupport, and select the Documents tab. This page can be accessed without logging in via the Documentation link on the iSupport page.
Contact Information	E-mail: support@force10networks.com Web: http://www.force10networks.com/support/ Telephone: US and Canada: 866.965.5800 International: 408.965.5800

Locating Serial Numbers

You can use the show switch *unit* command in the CLI to access the serial number of the designated switch (*unit* = stack ID). The serial number of the chassis is located on a sticker on the back of the chassis in the middle. The serial number is below the bar code and has 11 integers (numbers).

Figure 8-1. Serial Numbers on Back of Chassis



The serial numbers of the optional data modules (10G Ethernet and Stacking) are located on labels on their faces (some early-production modules have the PN on their baseboards). For serial numbers of the SFP optics, you can also access them through the CLI with either the `show hardware` or `show running-config` commands.

The serial number label of the optional DC Backup Power Supply (see [Backup Power Components on page 29](#)) is located on the base of the chassis.

Requesting a Hardware Replacement

To request replacement hardware, follow these steps:

Step	Task
1	Determine the part number and serial number of the component. To list the numbers for all components installed in the chassis, use the <code>show hardware</code> command.
2	Request a Return Materials Authorization (RMA) number from TAC by opening a support case. Open a support case by: <ul style="list-style-type: none">• Using the Create Service Request form on the iSupport page (see Contacting the Technical Assistance Center on page 56).• Contacting Dell Force10 directly by E-mail or by phone (see Contacting the Technical Assistance Center on page 56). Provide the following information when using E-mail or phone:<ul style="list-style-type: none">• Part number, description, and serial number of the component.• Your name, organization name, telephone number, fax number, and e-mail address.• Shipping address for the replacement component, including a contact name, phone number, and e-mail address.• A description of the failure, including log messages. This generally includes:<ul style="list-style-type: none">• Output from the <code>show tech-support [non-paged]</code> command (This report is very long, so the storage buffer in your terminal program should be set high.)• Output from the <code>show logging eventlog [unit]</code> command, where unit is the stack ID of the member unit that experienced the failure (This report is included as a section in the output of <code>show tech-support</code>.)• Console captures showing the error messages• Console captures showing the troubleshooting steps taken• Saved messages to a syslog server, if one is used

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