S5200F-ON Series Installation Guide

April 2019

DELLEMC

Notes, cautions, and warnings

(i) | **NOTE: A NOTE indicates important information that helps you make better use of your product.**

△ | **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ | **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

About this guide

This guide provides site preparation recommendations, step-by-step procedures for rack mounting and desk mounting your switch, inserting modules, and connecting to a power source.

⚠ | **CAUTION: To avoid electrostatic discharge (ESD) damage, wear grounding wrist straps when handling this equipment.**

⚠ | **WARNING: Only trained and qualified personnel can install this equipment. Read this guide before you install and power up this equipment. This equipment contains two power cords. Disconnect both power cords before servicing.**

⚠ | **WARNING: This equipment contains optical transceivers, which comply with the limits of Class 1 laser radiation.**

Figure 1. Class 1 laser product tag

⚠ | **WARNING: When no cable is connected, visible and invisible laser radiation may emit from the aperture of the optical transceiver ports. Avoid exposure to laser radiation. Do not stare into open apertures.**

ⓘ | **NOTE: Read this guide before unpacking the switch. For unpacking instructions, see Unpack.**

Regulatory

- Marketing model S5232F-ON is represented by the regulatory model E21W and the regulatory type E21W005.
- Marketing model S5248F-ON is represented by the regulatory model E21W and the regulatory type E21W002.
- Marketing model S5224F-ON is represented by the regulatory model E21W and the regulatory type E21W003.
- Marketing model S5296F-ON is represented by the regulatory model E26W and the regulatory type E26W001.
- Marketing model S5212F-ON is represented by the regulatory model E29W and the regulatory type E29W001.

Topics:

- Related documents
- Information symbols

Related documents

For more information about the S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) see the following documents:

- *OS10 Enterprise Edition User Guide*
- *OS10 Enterprise Edition Release Notes*
- *S5200F-ON Series Set-up Guide*
- *S5200F-ON Series Release Notes*

- *S5200-ON Series BMC User Guide*
- *Open Networking Hardware Diagnostic Guide*

ⓘ **NOTE:** To access product documentation and resources that might be helpful to install, configure, and troubleshoot the specific Dell EMC Networking switch, see **Dell EMC Networking Hardware Platforms and OS9 Info Hub**. For all other resources, see Dell EMC support: **www.dell.com/support**.

Information symbols

This book uses the following information symbols:

ⓘ **NOTE:** The Note icon signals important operational information.

△ **CAUTION:** The Caution icon signals information about situations that could result in equipment damage or loss of data.

⚠ **WARNING:** The Warning icon signals information about hardware handling that could result in injury.

⚠ **WARNING:** The ESD Warning icon requires that you take electrostatic precautions when handling the device.

S5200F-ON Series switch

The following sections describe the Dell EMC S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch:

Topics:

Introduction

The S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch is a full-featured fixed form-factor top-of-rack (ToR) compact 10/25/40/50/100/200GbE switch for data center networks with small form-factor pluggable plus (SFP+), small form-factor pluggable 28 (SFP28), quad small form-factor pluggable 28 (QSFP28), and quad small form-factor pluggable double density (QSFP-DD) ports. In addition, the S5200F-ON Series switch is a 10/25/40/50/100/200GbE switch with 10/25GbE links for server connections and 40/50/100GbE links for clustering—virtual link trunking (VLT) and stacking—and uplinks to aggregation and core switches. Except for the S5212F-ON, the switch includes two hot-swappable AC or DC power supply units (PSUs) and four hot-swappable fan units. The S5212F-ON includes two fixed AC or DC PSUs and four fixed fan units.

- S5212F-ON—one-half rack unit
- S5224F-ON—one rack unit
- S5232F-ON—one rack unit
- S5248F-ON—one rack unit
- S5296F-ON—two rack units

The S5200F-ON Series switch includes:

- S5212F-ON: twelve 25GbE SFP28 ports and three 100GbE QSFP28 ports
- S5224F-ON: twenty-four 25GbE SFP28 ports and four 100GbE QSFP28 ports
- S5232F-ON: thirty-two 100GbE QSFP28 ports and two 10GbE SFP+ ports
- S5248F-ON: forty-eight 25GbE SFP28 ports, four 100GbE QSFP28 ports, and two 200GbE QSFP-DD ports
- S5296F-ON: ninety-six 25GbE SFP28 ports and eight 100GbE QSFP28 ports

The S5232F-ON, S5248F-ON, and S5296F-ON support the following configurations:

- 96 x 10GbE + 8 x 100GbE
- 96 x 25GbE + 8 x 100GbE
- 128 x 10GbE
- 128 x 25GbE
- 64 x 50GbE
- 32 x 40GbE
- 32 x 100GbE

The S5224F-ON supports the following configurations:

- 24 x 25GbE
- 24 x 10GbE

The S5212F-ON supports the following configurations:

- 12 x 25GbE + 3 x 100GbE
- 24 X 25GbE
- 12 x 10GbE + 3 x 100GbE
- 12 x 10GbE + 12 x 25 GbE
- 12 x 25GbE + 3 x 40GbE
- 24 x 10GbE
- 12 x 25GbE + 6 x 50GbE

The S5232F-ON switch I/O-side view:
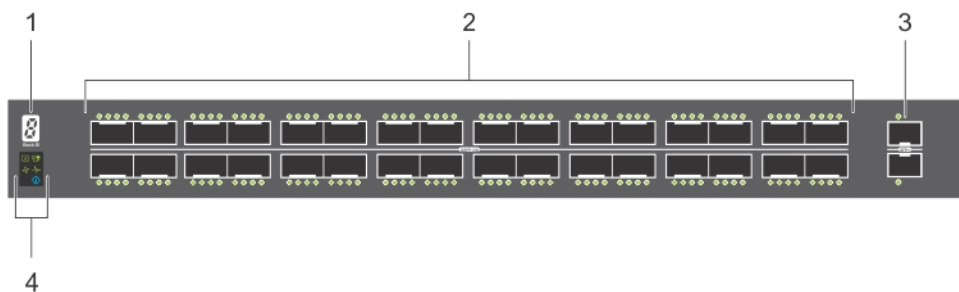
| 1 | Stack ID | 2 | Thirty-two 100GbE QSFP28 ports |
| 3 | Two 10GbE SFP+ ports | 4 | LED Status Icons |

The S5248F-ON switch I/O-side view:
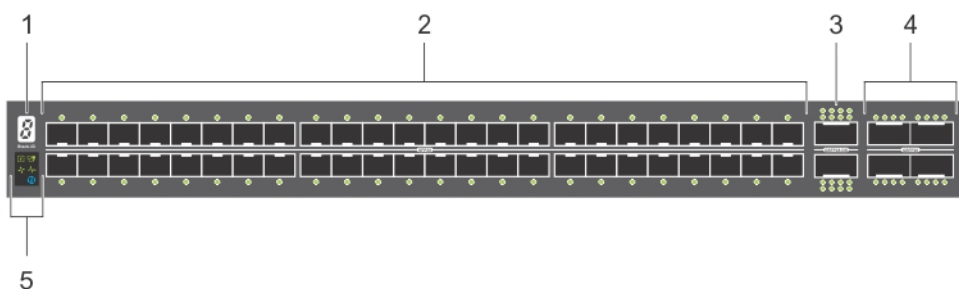
1	Stack ID	2	Forty-eight 25GbE SFP28 ports
3	Two 200GbE QSFP-DD ports	4	Four 100GbE QSFP28 ports
5	LED status icons		

The S5296F-ON switch I/O-side view:
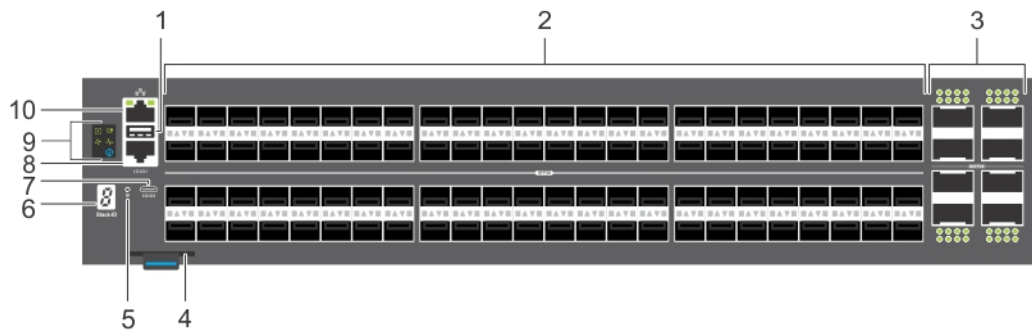
1	USB Type A	2	Ninety-six 25GbE SFP28 ports
3	Eight 100GbE QSFP28 ports	4	Luggage tag
5	Reset button	6	Stack ID
7	MicroUSB-B console port	8	RJ45 console port
9	LED status icons	10	RJ45 Ethernet port

The S5224F-ON switch I/O-side view:
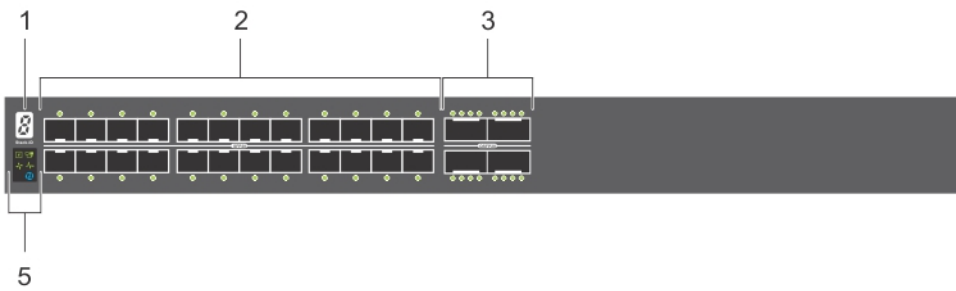
1	Stack ID	2	Twenty-four SFP28 ports
3	Four 100GbE QSFP28 ports	4	LED status icons

The S5212F-ON AC switch I/O-side view:
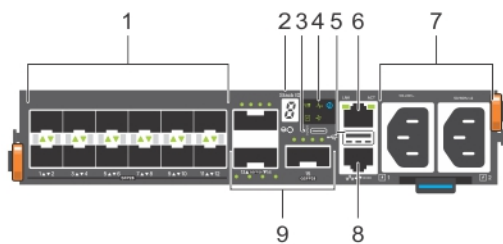
1	Twelve 25GbE SFP28 ports	2	Stack ID
3	MicroUSB-B console port	4	LED status icons
5	USB Type A	6	RJ45 Ethernet port

7	AC PSUs	8	RJ45 console port
9	Three 100GbE QSFP28 ports		

The S5212F-ON DC switch I/O-side view:
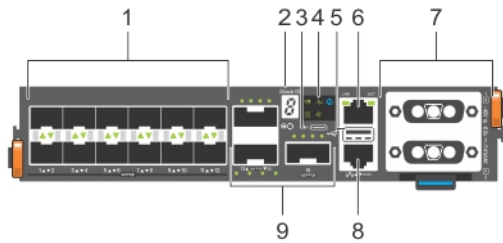
1	Twelve 25GbE SFP28 ports	2	Stack ID
3	MicroUSB-B console port	4	LED status icons
5	USB Type A	6	RJ45 Ethernet port
7	DC PSUs	8	RJ45 console port
9	Three 100GbE QSFP28 ports		

The S5212F-ON AC and DC switches have a reset button on the I/O-side below the Stack ID LED.

The S5200F-ON Series switch has one RJ45 serial console port, one Micro-USB type-B console port, one 10/100/1000 Base-T Ethernet management port, one USB type-A port for the external storage, and for the S5212F-ON and S5296F-ON switches only, one USB extension cable, which is packaged separately. Management ports are located on the PSU-side of the switch except for the S5212F-ON switch that has the management ports on the I/O-side of the switch.

The S5232F-ON or S5248F-ON switch PSU-side view:
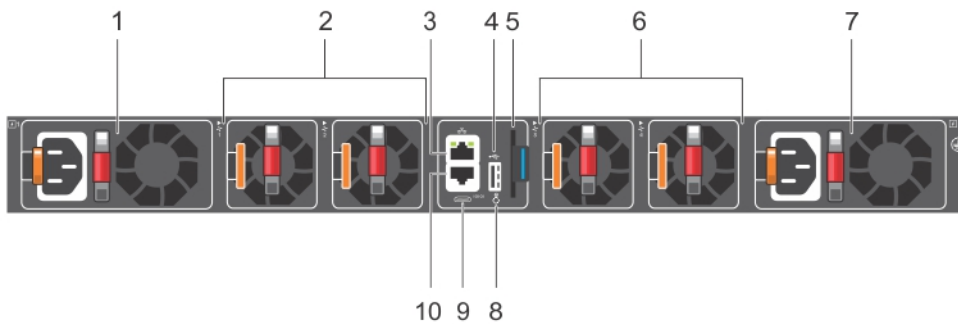
1	AC PSU1	2	Fan modules
3	RJ45 Ethernet port	4	USB Type A
5	Luggage tag	6	Fan modules
7	AC PSU2	8	Reset button
9	MicroUSB-B console port	10	RJ45 console port

The S5296F-ON switch PSU-side view:
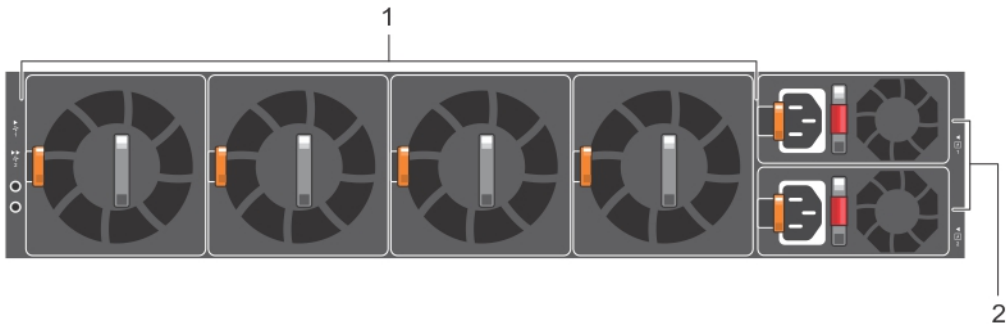
1	Fan units	2	AC PSU units

The S5224F-ON switch PSU-side view:
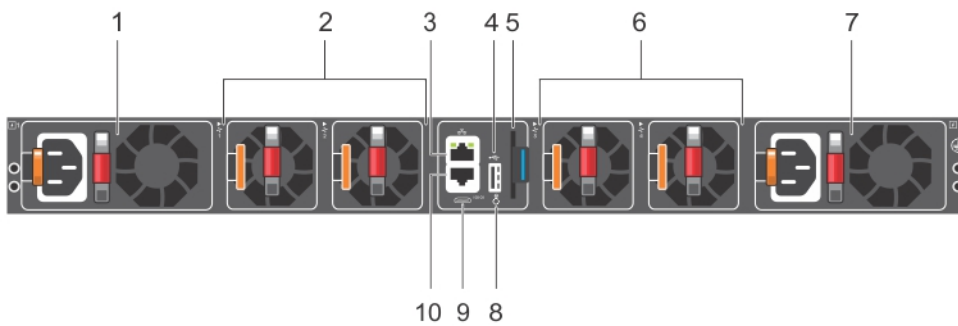
1	AC PSU	2	Fans
3	RJ45 Ethernet port	4	USB Type A
5	Luggage tag	6	Fans
7	AC PSU	8	Reset button
9	MicroUSB-B console port	10	RJ45 console port

The S5212F-ON switch PSU-side view:
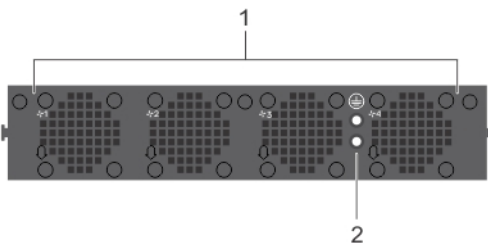
1	Fans	2	Holes for ground lug installation

Features

The S5200F-ON Series switch offers the following features:

- Ports:
    - S5212F-ON—twelve 25GbE SFP28 ports and three 100GbE QSFP28 ports

- S5224F-ON—twenty-four 25GbE SFP28 ports and four 100GbE QSFP28 ports
- S5232F-ON—thirty-two 100GbE QSFP28 ports and two 10GbE SFP+ ports
- S5248F-ON—forty-eight 25GbE SFP28 ports, four 100GbE QSFP28 ports, and two 200GbE QSFP-DD ports
- S5296F-ON—ninety-six 25GbE SFP28 ports and eight 100GbE QSFP28 ports
- One MicroUSB-B console port
- One RJ45 console port
- One USB Type A port for more file storage
- Four-core Intel Denverton central processing unit (CPU) system with 16GB SDRAM and 64GB SSD
- One 10/100/1000BaseT Ethernet management port
- Temperature monitoring
- Software-readable thermal monitor
- Real time clock (RTC) support
- All switches except S5212F-ON: two hot-pluggable redundant PSUs
- All switches except S5212F-ON: four hot-pluggable replaceable fan modules
- S5212F-ON: two fixed PSUs
- S5212F-ON: four fixed fans modules
- Power management monitoring
- Two-hole ground lug
- S5212F-ON and S5296F-ON—USB male-female extension cable
- Switch:
  - S5212F-ON—Standard one-half rack unit
  - S5224F-ON—Standard one rack unit
  - S5232F-ON—Standard one rack unit
  - S5248F-ON—Standard one rack unit
  - S5296F-ON—Standard two rack units

Physical dimensions

The S5200F-ON Series switch have the following physical dimensions:

- S5212F-ON—one-half rack unit:
  - 7.87 x 16 x 1.72 inches (W x D x H)
  - 199.8 x 406.4 x 43.6 mm (W x D x H)

- S5224F-ON, S5232F-ON, S5248F-ON—one rack unit:
  - 17.1 x 18.1 x 1.72 inches (W x D x H)
  - 434 x 460 x 43.6 mm (W x D x H)
- S5296F-ON—two rack units:
  - 16.6 x 20.1 x 3.42 inches (W x D x H)
  - 422 x 511 x 87 mm (W x D x H)

LED display

The S5200F-ON Series switch includes LED displays on the I/O side of the switch. This section describes open networking installation environment (ONIE) LED behaviors. Some LED behaviors may change after you install your software.

LED behavior

The S5200F-ON Series switch LED behavior is seen during ONIE operations.

The S5232F-ON switch LEDs:
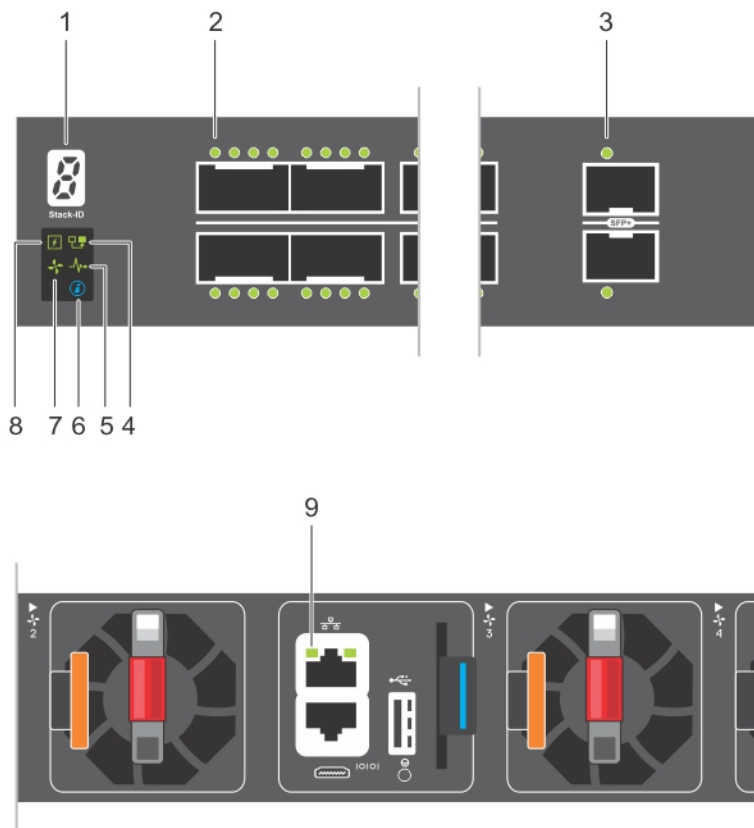
1	Stack ID LED	2	Port Activity LEDs
3	Port Activity LED	4	Master LED
5	System LED	6	Locator LED
7	Fan LED	8	Power LED
9	RJ45 Ethernet Port LED		

The S5248F-ON switch LEDs:
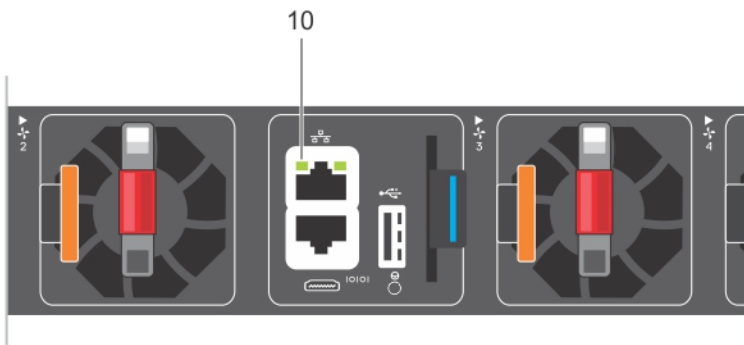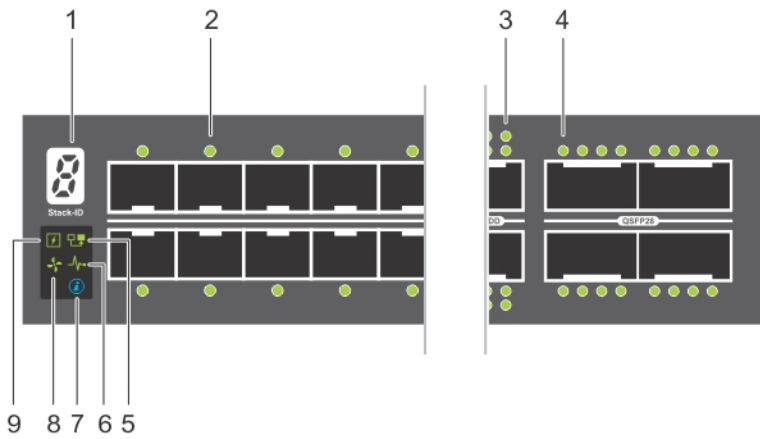
1	Stack ID LED	2	Port Activity LED
3	Port Activity LEDs	4	Port Activity LEDs
5	Master LED	6	System LED
7	Locator LED	8	Fan LED
9	Power LED	10	RJ45 Ethernet Port LED

The S5296F-ON switch LEDs:
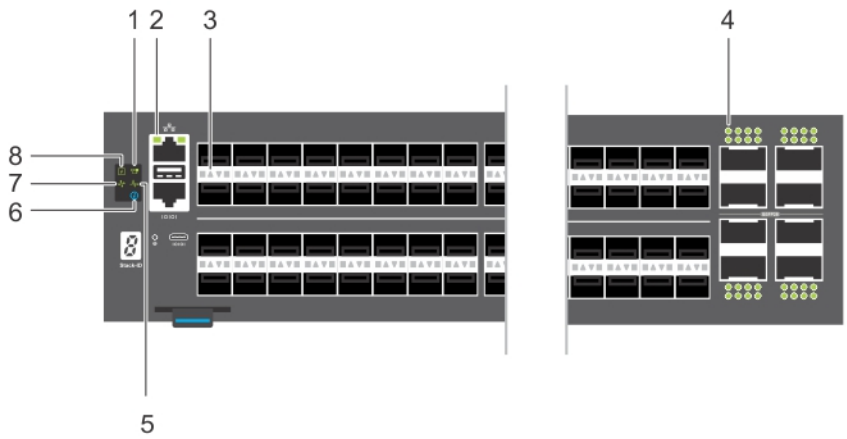
1	Stack ID LED	2	Port Activity LEDs
3	Port Activity LEDs	4	Port Activity LEDs
5	System LED	6	Locator LED
7	Fan LED	8	Power LED

The S5224F-ON switch LEDs:
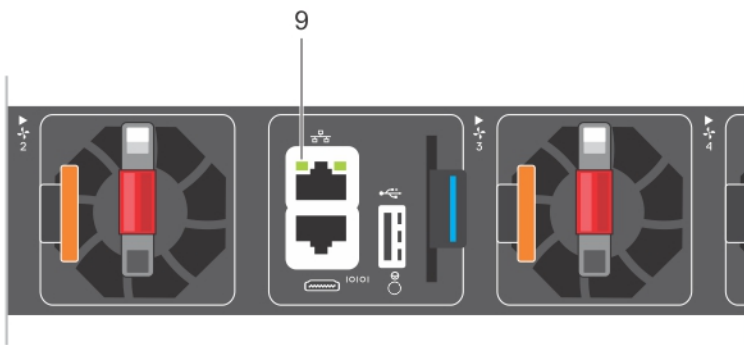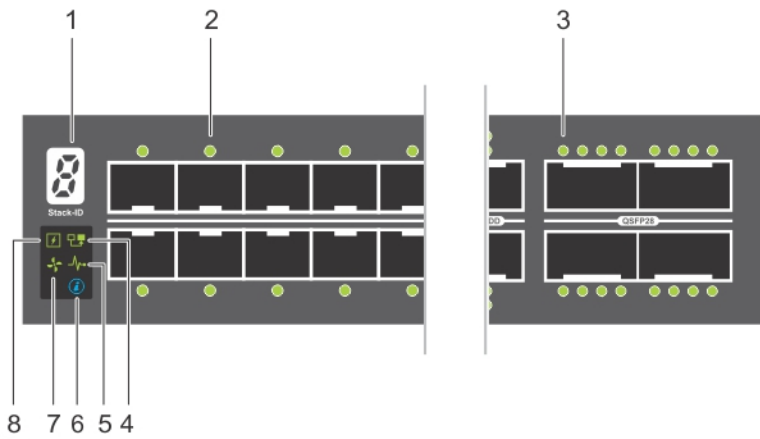
1	Stack ID LED	2	Port Activity LED
3	Port Activity LED	4	Master LED
5	System LED	6	Locator LED
7	Fan LED	8	Power LED
9	RJ45 Port LED		

The S5212F-ON switch LEDs:
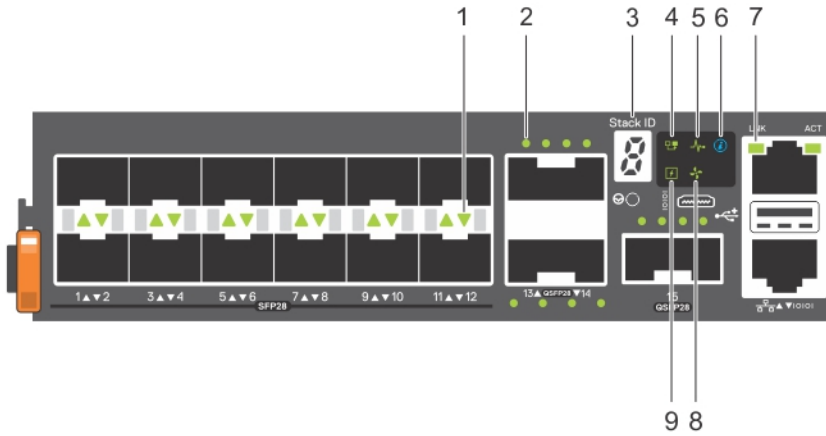
1	Port Activity LED	2	Port Activity LED
3	Stack ID LED	4	Master LED
5	System LED	6	Locator LED
7	Link Activity LED	8	Fan LED
9	Power LED		

Table 1. S5200F-ON Series switch LED behavior

LED	Description
System Status/Health LED	• Solid green—Normal operation • Flashing green—Booting • Solid yellow—Critical system error • Flashing yellow—Noncritical system error, fan failure, or power supply failure
Power LED	• Off—No power • Solid Green—Normal operation • Solid yellow—POST is in process • Flashing yellow—Power supply failed
Master LED	• Off—Switch is in Stacking Slave mode • Solid green—Switch is in Stacking Master or Standalone mode
FAN LED	• Off—No power • Solid green—Normal operation; fan powered and running at the expected RPM • Flashing yellow—Fan fault—including incompatible airflow direction when you insert the PSU or fan trays with differing airflows
PSU LED	• Off—No power • Solid green—Normal operation • Flashing yellow—PSU warning event; power continues to operate • Flashing green—4Hz with five times on and off: Mismatch

LED	Description
	• Flashing green—Firmware update
LOCATOR LED/System Beacon	• Off—Locator function disabled • Flashing blue—Locator function enabled
7-Segment LED for stacking	• Off—No power • Solid green—Hex digit representing the stack unit ID

Table 2. System management Ethernet port LEDs

LED	Description
Link LED	• Off—No link • Solid green—Link operating at a maximum speed, autonegotiated/forced to 1000MBase-T mode • Solid yellow—Link operating at a lower speed, autonegotiated/forced or 10/100MBase-T mode
Activity LED	• Off—No activity • Flashing green—Port activity

Table 3. SFP28 port LEDs—S5232F-ON, S5248F-ON, and S5296F-ON

LED	Description
Link LED	All four LEDs: • Off—No link • Solid green—Link operating at maximum speed, 25G • Solid yellow—Link operating at a lower speed, 10G or 1G • Flashing green, ~30ms—Port activity operating at maximum speed, 25G port • Flashing yellow, ~30ms—Port activity operating at lower speed, 10G or 1G port • Flashing yellow, 1 second on/off—port beacon
Activity LED	• Off—No activity • Flashing green—port activity at maximum speed • Flashing yellow—port activity at lower speed

Table 4. SFP+ port LEDs—S5232F-ON

LED	Description
Link LED	All four LEDs: • Off—No link • Solid green—Link operating at maximum speed, 10G • Solid yellow—Link operating at a lower speed, 1G • Flashing green, ~30ms—Port activity operating at maximum speed, 10G port

LED	Description
	• Flashing yellow, ~30ms—Port activity operating at lower speed, 1G port
	• Flashing yellow, 1 second on/off—port beacon
Activity LED	
	• Off—No activity
	• Flashing green—port activity at maximum speed
	• Flashing yellow—port activity at lower speed

(i) **NOTE:** The first QSFP-DD port LED shows 200GbE, 100GbE, 40GbE, and 10GbE mode. All eight QSFP-DD port LEDs show 8x25GbE or 8x10GbE mode. The first and fifth QSFP-DD port LEDs show 2x100GbE mode. The first, second, fifth, and sixth QSFP-DD port LEDs show 2x50GbE mode. The first and second LEDs for the first 2x50GbE port and the fifth and sixth LEDs for the second 2x50GbE port.

Table 5. QSFP-DD port LEDs—S5248F-ON

LED	Description
Link/Activity LED—200GbE, 100GbE, 40GbE, or 10GbE mode	First LED:
	• Off—No link/activity
	• Solid green—Port link operating at maximum speed, 200G
	• Flashing green—Port activity operating at maximum speed, 200G
	• Solid yellow—Port link operating at a lower speed, 100G, 40G or 10G port
	• Flashing yellow, ~30ms—Port activity operating at lower speed, 100G, 40G or 10G port
	• Flashing yellow, ~1 second on/off—Port beacon
Link/Activity LED—8x25GbE or 8x10GbE mode	All eight LEDs:
	• Off—No link/activity
	• Solid green—Link operating at maximum speed, 8x25G port
	• Flashing green—Link activity operating at maximum speed, 8x25G port
	• Solid yellow—Link operating at a lower speed, 8x10G port
	• Flashing yellow, ~30ms—Port activity operating at lower speed, 8x10G port
	• Flashing yellow, 1 second on/off—Port beacon
Link/Activity LED—2x100G mode	First and fifth LEDs:
	• Off—No link/activity
	• Solid green—Port link operating 2x100G
	• Flashing yellow—Port activity at 2x100G port
	• Flashing yellow, 1 second on/off—Port beacon
Link/Activity LED—4x50GbE mode	First, second, fifth, and sixth LEDs"
	• Off—No link/activity
	• Solid green—Port link operating 2x50G
	• Flashing yellow—Port activity at 2x50G port
	• Flashing yellow, 1 second on/off—Port beacon

> (i) **NOTE:** The first QSFP28 LED shows 100GbE, 40GbE, or 10GbE mode. All four QSFP28 port LEDs show 4x25GbE or 4x10GbE mode. The first and third QSFP28 port LEDs show 2x50GbE mode.

Table 6. QSFP28 port LEDs—S5232F-ON, S5248F-ON, and S5296F-ON

LED	Description
Link/Activity LED—100GbE, 40GbE, or 10GbE mode	First LED: • Off—No link/activity • Solid green—Port link operating at maximum speed, 100G • Flashing green—Port activity operating at maximum speed, 100G • Solid yellow—Port link operating at a lower speed, 40G or 10G port • Flashing yellow, ~30ms—Port activity operating at lower speed, 40G or 10G port • Flashing yellow, ~1 second on/off—Port beacon
Link/Activity LED—4x25GbE or 4x10GbE mode	All four LEDs: • Off—No link/activity • Solid green—Link operating at maximum speed, 4x25G port • Flashing green—Link activity operating at maximum speed, 4x25G port • Solid yellow—Link operating at a lower speed, 4x10G port • Flashing yellow, ~30ms—Port activity operating at lower speed, 4x10G port • Flashing yellow, 1 second on/off—Port beacon
Link/Activity LED—2x50G mode	First and third LEDs: • Off—No link/activity • Solid green—Port link operating 2x50G • Flashing yellow—Port activity at 2x50G port • Flashing yellow, 1 second on/off—Port beacon
Link/Activity LED—2x50GbE mode	First, second, fifth, and sixth LEDs" • Off—No link/activity • Solid green—Port link operating 2x50G • Flashing yellow—Port activity at 2x50G port • Flashing yellow, 1 second on/off—Port beacon

Prerequisites

The following is a list of components that are required for successful switch installation:

> (i) **NOTE:** For detailed installation instructions, see Site preparations and S5200F-ON Series switch installation.

• S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch or multiple switches, if stacking
• AC or DC country- and regional-specific cables to connect the AC or DC power source to each switch AC or DC power supplies
• ReadyRail mounting brackets for rack installation, included
• Screws for rack installation, not included
• #1 and #2 Phillips screw drivers, not included
• Torx screwdriver, not included

- Ground cable screws for L-bracket, included
- Copper/fiber cables
- S5212F-ON and S5296F-ON: USB male-female extension cable

Other optional components are:

- Ground cable and lug for the frame-end of the ground cable
- Extra mounting brackets
- Extra power supply unit
- Extra fan module

ⓘ **NOTE: The DC ground lug kit ships with the other accessories inside the shipping box.**

S5200F-ON Series switch configurations

You can order the S5200F-ON Series switch in several different configurations.

- S5200F-ON Series AC or DC Normal Airflow switch:
  - S5212F-ON—one-half U, 12 x 25G SFP28 ports, 3 x 100G QSFP28 ports, two AC or DC power supplies, four fan subsystems with airflow from the I/O side to the power supply side, and one USB male-female extension cable.
  - S5224F-ON—one U, 24 x 25G SFP28 ports, 4 x 100G QSFP28 ports, two AC or DC power supplies, and four fan subsystems with airflow from the I/O side to the power supply side
  - S5232F-ON—one U, 32 x 100GbE ports, two AC or DC power supplies, and four fan subsystems with airflow from the I/O side to the power supply side
  - S5248F-ON— one U, 48 x 25GbE ports, 4 x 200GbE ports, 2 x 200GbE QSFP-DD ports, two AC or DC power supplies, and four fan subsystems with airflow from the I/O side to the power supply side
  - S5296F-ON— two U, 96 x 25GbE ports and 8 x 100GbE ports, two AC or DC power supplies, four fan subsystems with airflow from the I/O side to the power supply side, and one USB male–female extension cable
- S5200F-ON Series AC or DC Reverse Airflow switch:
  - S5212F-ON—one-half U, 12 x 25G SFP28 ports, 3 x 100G QSFP28 ports, two AC or DC power supplies, four fan subsystems with airflow from the power supply side to the I/O, and one USB male-female extension cable
  - S5224F-ON—one U, 24 x 25G SFP28 ports, 4 x 100G QSFP28 ports, two AC or DC power supplies, and four fan subsystems with airflow from the power supply side to the I/O
  - S5232F-ON—one U, 32 x 100GbE ports, two AC or DC power supplies, and four fan subsystems with airflow from the power supply side to the I/O
  - S5248F-ON— one U, 48 x 25GbE ports, 4 x 200GbE ports, 2 x 200GbE QSFP-DD ports, two AC or DC power supplies, and four fan subsystems with airflow from the power supply side to the I/O
  - S5296F-ON— two U, 96 x 25GbE ports and 8 x 100GbE ports, two AC or DC power supplies, four fan subsystems with airflow from the power supply side to the I/O, and one USB male–female extension cable
- Fan with airflow from the I/O side to the PSU side—normal airflow
- Fan with airflow from the PSU side to the I/O side—reverse airflow
- AC or DC power supply with airflow from the I/O side to the PSU side—normal airflow
- AC or DC power supply with airflow from the PSU side to the I/O side—reverse airflow

Luggage tag

The switch has a pull-out tag, known as a luggage tag, on the PSU-side of the switch. The front of the luggage tag includes switch ID information. The back of the luggage tag includes a QRL that takes you to a How-To site where you can watch videos about racking the switch, replacing components, configuring port channels, and so on.

The S5224F-ON, S5232F-ON, or S5248F-ON luggage tag:
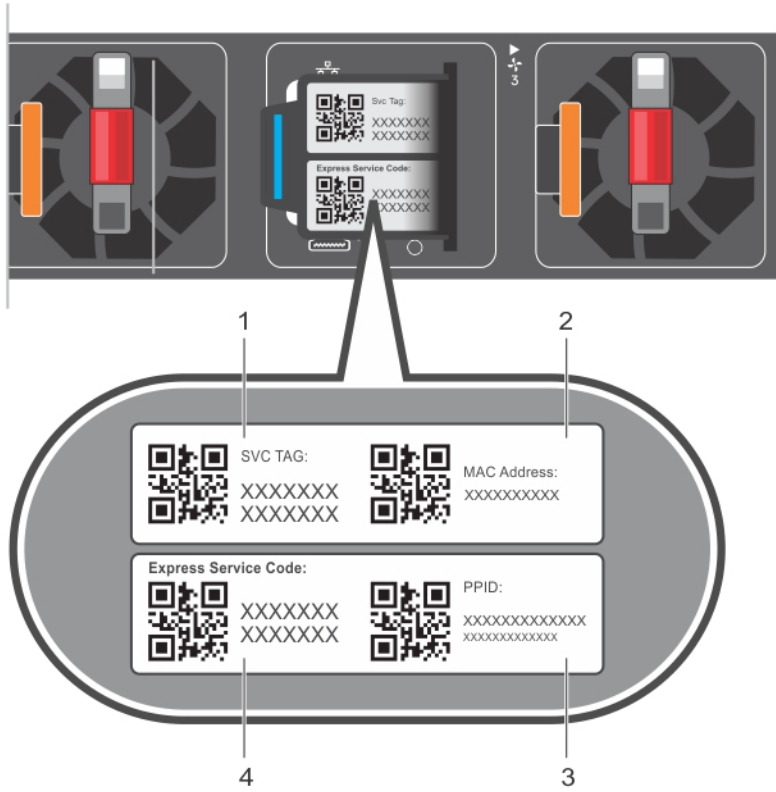
| 1 | Service tag | 2 | MAC address |
| 3 | PPID | 4 | Express service code |

The S5296F-ON luggage tag:
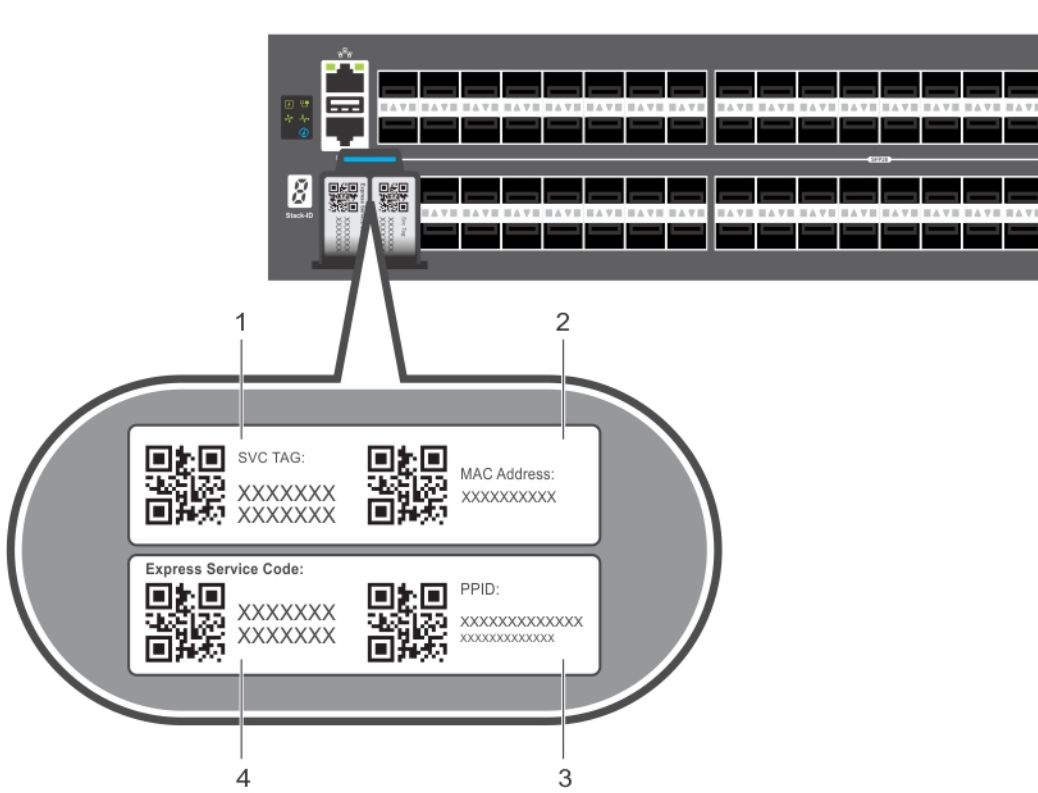
1 Service tag	2 MAC address
3 PPID	4 Express service code

The S5212F-ON AC luggage tag:
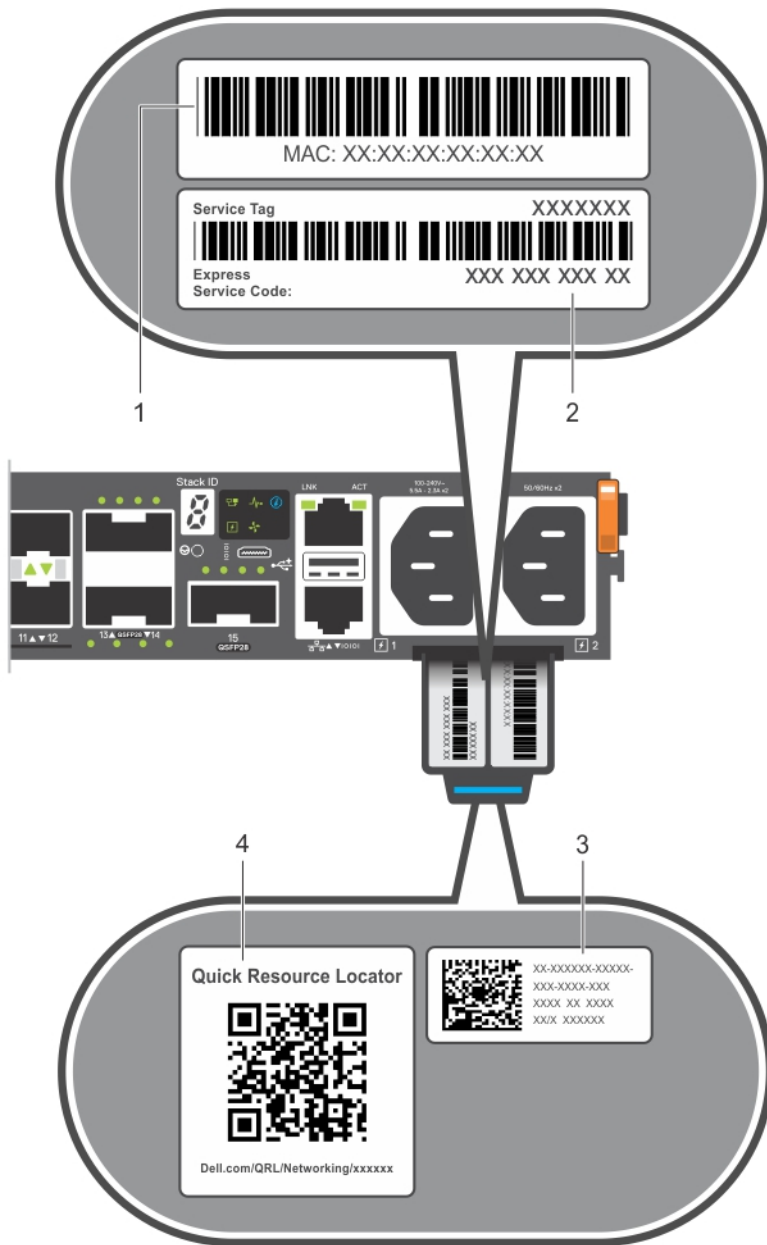
| 1 | MAC address | 2 | Express service code |
| 3 | Service tag | 4 | QRL |

The S5212F-ON DC luggage tag:
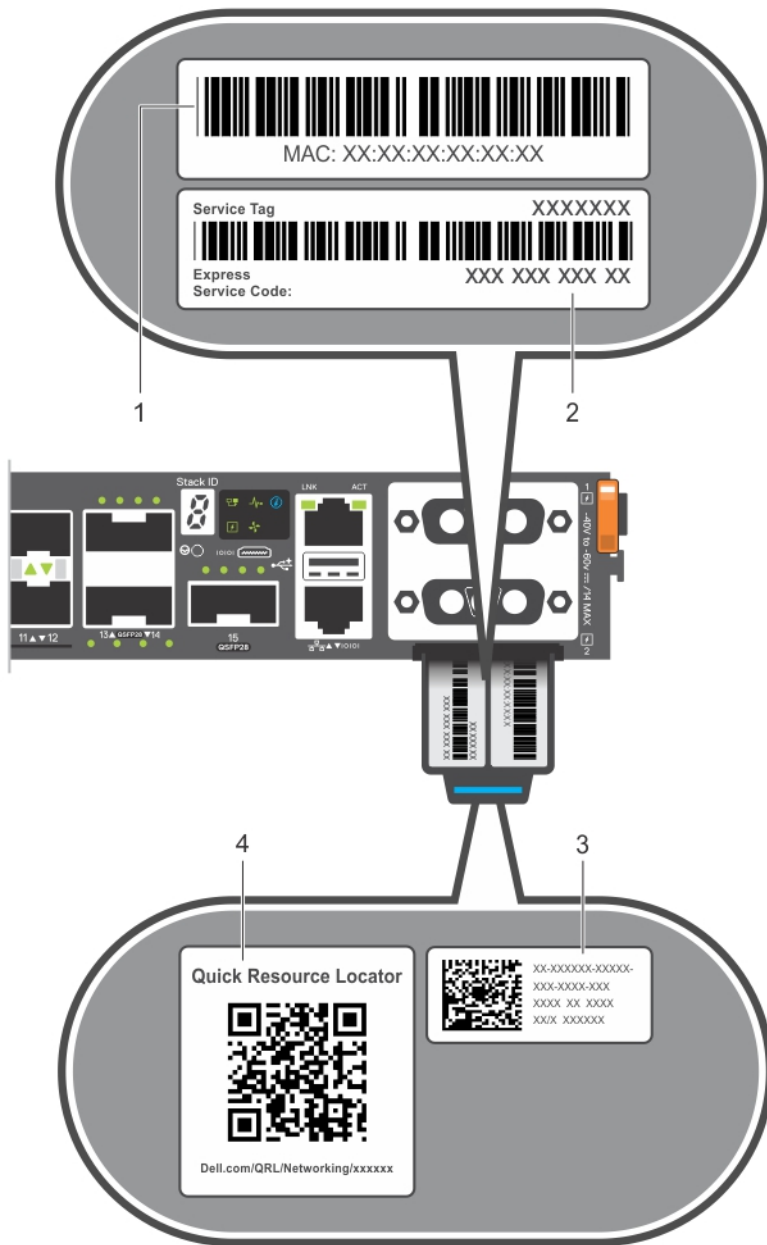
1	MAC address	2	Express service code
3	Service tag	4	QRL

Site preparations

The S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch is suitable for installation as part of a common bond network (CBN).

You can install the switch in:

- Network telecommunication facilities
- Data centers
- Other locations where the National Electric Code (NEC) applies

ⓘ **NOTE: Install the switch into a rack or cabinet before installing any additional components such as cables or optics.**

Topics:

- Site selection
- Cabinet placement
- Rack mounting
- Switch ground
- Fans and airflow
- Power
- Storing components

Site selection

Install the switch equipment in restricted access areas.

A restricted access area is one in which service personnel can only gain access using a special tool, lock, key or other means of security. The authority responsible for the location controls access to the restricted area.

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

- Near an adequate power source. Connect the switch to the appropriate branch circuit protection according to your local electrical codes.
- Switch environmental temperature range is from 0° to 45°C (32° to 113°F).
- Relative humidity is from 5 to 90 percent noncondensing.
- 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.
- Inside the restricted access area, positioned in a rack or cabinet, or on a desktop with adequate space in the front, back, and sides for proper ventilation and access.
- Install the switch in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

For more information about switch storage and environmental temperatures, see Specifications.

Cabinet placement

Install the S5200F-ON Series switch only in indoor cabinets designed for use in a controlled environment.

Do not install the switch in outside cabinets. For cabinet placement requirements, see Site selection.

The cabinet must meet minimum size requirements. Airflow must be in accordance with the Electronic Industries Alliance (EIA) standard. Ensure that there is a minimum of 5 inches (12.7 cm) between the intake and exhaust vents and the cabinet wall.

Rack mounting

When you prepare your equipment rack, ensure that the rack is grounded.

Ground the equipment rack to the same ground point the power service in your area uses. The ground path must be permanent.

Switch ground

Dell EMC recommends you ground your switch. Use the S5200F-ON Series switch in a common bond network (CBN).

Connect the grounding cables as described in S5200F-ON Series switch installation.

ⓘ **NOTE: For an AC-powered switch, although the third conductor of the AC power cord provides a ground path, Dell EMC recommends grounding your switch with a dedicated ground wire.**

ⓘ **NOTE: For a DC-powered switch, the only way to safely ground your switch is to attach a dedicated ground wire. The ground lug kit ships in a plastic bag placed with the other accessories inside the shipping box. The ground lug bracket screws ship attached to the switch. Before you install the DC switch in the dual-tray, attach the ground lug and bracket to the switch using the included screws and then attach the DC ground wire to the ground lug. The DC-powered switch ships with the DC ground lug, bracket, and screws.**

Fans and airflow

The S5200F-ON Series switch fans support two airflow options: normal and reverse.

Fan combinations

Fan installation is done as part of the factory install based on stock keeping unit (SKU) type. The S5200F-ON Series switch has SKUs that support the following configurations:

- AC or DC PSU with fan airflow from the I/O to the PSU—the red indicator is the normal airflow direction
- AC or DC PSU with fan airflow from the PSU to the I/O—the blue indicator is the reverse airflow direction

Order the fans suitable to support your site's ventilation. Use a single type of airflow fan in your switch. Do not mix reverse and normal airflows in a single S5200F-ON Series switch.

For proper ventilation, position the switch in an equipment rack or cabinet with a minimum of 5 inches (12.7 cm) of clearance around the exhaust vents. When you install two S5200F-ON switches near each other, to permit proper airflow, position the two switches at least 5 inches (12.7 cm) apart. The fan speed varies based on internal temperature monitoring. The S5200F-ON Series switch never intentionally turns off the fans.

For more information, see Fans.

Power

To connect the switch to the applicable power source, use the appropriate power cord. An AC power cord is included with each PSU.

When installing AC or DC switches, follow the requirements of the National Electrical Code, ANSI/NFPA 70, where applicable.

The switch is powered-up when you connect the power cord between the switch and the power source. For more information, see Power supplies.

⚠ **CAUTION: Always disconnect the power cable before you service the power supply slots. The switch has multiple power cords. Before servicing, ensure all power cords are disconnected.**

⚠ **CAUTION: On an AC switch, use the power supply cord as the main disconnect device. Ensure that the socket-outlet is located and installed near the equipment and is easily accessible.**

ⓘ **NOTE:**
Module power is software controlled. You do not see module LEDs when the switch powers up in ONIE.

Storing components

If you do not install your S5200F-ON Series switch and components immediately, properly store the switch and all components using these guidelines:

- Storage location temperature must remain constant. The storage range is from -40°C to 70°C (-40° to 158°F).
- Store on a dry surface or floor, away from direct sunlight, heat, and air conditioning ducts.
- Store in a dust-free environment.

ⓘ **NOTE: ESD damage can occur when components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S5200F-ON Series switch and accessories. After you remove the original packaging, place the S5200F-ON Series switch and components on an anti-static surface.**

S5200F-ON Series switch installation

To install the S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch, complete the installation procedures in the order presented in this chapter.

Always handle the switch and components with care. Avoid dropping the switch or its field replaceable units (FRUs).

For the S5212F-ON switch installation instructions, see One-half U front-rack installation. For the S5224F-ON, S5248F-ON, and S5232F-ON switches, you can install the ReadyRails system. Due to the chassis weight, the S5296F-ON switch does not support a two-post rack installation; you must install the S5296F-ON in a four-post rack. For the S5296F-ON switch installation instructions, see S5296F-ON four-post rack assembly.

> ⓘ **NOTE: ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S5200F-ON Series switch and components. As with all electrical devices of this type, take all the necessary safety precautions to prevent injury when installing this switch.**

Topics:

- Unpack
- Ground cable
- Rack or cabinet hardware installation
- One-half U front-rack installation
- One U ReadyRails installation
- Two U four-post rack assembly
- DC power connections
- S5212F-ON only DC power connections
- Optics installation
- Switch start up
- After switch placement
- Switch replacement

Unpack

> ⓘ **NOTE: Before unpacking the switch, inspect the container and immediately report any evidence of damage.**

> ⓘ **NOTE: For the S5212F-ON and S5296F-ON switches only: the USB extension cable is packaged separately. Do not throw it away.**

When unpacking the switch, make sure that the following items are included:

- One S5200F-ON Series switch
- Two sets of rail kits, no tools needed
- One RJ45 to DB-9 female cable
- S5232F-ON, S5248F-ON, S5296F-ON, and S5224F-ON: Ground lug kit
- S5232F-ON, S5248F-ON, S5296F-ON, and S5224F-ON: Two hot-swappable PSUs
- S5232F-ON, S5248F-ON, S5296F-ON, and S5224F-ON: Four hot-swappable fan units
- S5212F-ON: Two fixed PSUs

- S5212F-ON: one USB extension cable; male to female
- S5212F-ON: Two fixed fan units
- S5296F-ON: one USB extension cable; male to female
- Two country- and region-specific AC power cables and wire clips
- *S5200F-ON Series Set-up Guide*
- *Safety and Regulatory Information*
- *Warranty and Support Information*

Unpacking Steps

Unpack the system carefully.

1   Place the container on a clean, flat surface and cut all straps securing the container.

2   Open the container or remove the container top.

3   Carefully remove the switch from the container and place it on a secure and clean surface.

4   Remove all packing material.

5   Inspect the product and accessories for damage.

Ground cable

To attach a ground cable to the switch, use the included M4 screws.

ⓘ **NOTE: For an AC-powered switch, although the third conductor of the AC power cord provides a ground path, Dell EMC recommends grounding your switch with a dedicated ground wire.**

ⓘ **NOTE: For a DC-powered switch, the only way to safely ground your switch is to attach a dedicated ground wire. The ground lug kit ships in a plastic bag placed with the other accessories inside the shipping box. The ground lug bracket screws ship attached to the switch. Before you install the DC switch in the dual-tray, attach the ground lug and bracket to the switch using the included screws and then attach the DC ground wire to the ground lug.**

The ground cable is not included. The grounding lugs must be a UL-recognized, crimp-type lug.

△ **CAUTION: Grounding conductors *must* be made of copper. Do not use aluminum conductors.**

ⓘ **NOTE: Coat the one-hole lug with an anti-oxidant compound before crimping. Also, bring any unplated mating surfaces to a shiny finish and coat with an anti-oxidant before mating. Plated mating surfaces must be clean and free from contamination.**

ⓘ **NOTE: The rack installation ears are not suitable for grounding.**

To connect the ground cable to the switch:

1   Cut your user-supplied ground cable to the desired length.

   The cable length must facilitate proper operation of the fault interrupt circuits. Use the shortest cable route allowable.

2   Crimp the ground cable inside the pre-installed ground lug.

3   Attach the other end of the ground cable to a suitable ground point such as the rack or cabinet.

   The rack installation ears are not a suitable grounding point.

Rack or cabinet hardware installation

You may either place the switch on a rack shelf or mount the switch directly into a 19" wide, EIA-310- E-compliant rack. Rack mounting for the S5232F-ON, S5248F-ON, and S5224F-ON switches includes four-post, two-post, round threaded holes, or square holes. The ReadyRails system is provided for 1U front-rack and two-post installations.

Do not use the ReadyRails system for the S5296F-ON or S5212F-ON switches. For the S5212F-ON switch, see One-half U front-rack installation. For the S5296F-ON switch, see Two U four-post rack assembly.

The ReadyRails system includes separately packaged rail assemblies.

⚠️ **WARNING: This document is a condensed reference. Read the safety instructions in your _Safety, Environmental, and Regulatory_ information booklet before you begin.**

ⓘ **NOTE: The illustrations in this document are not intended to represent a specific switch.**

ⓘ **NOTE: Do not the use the mounted ReadyRails as a shelf or a workplace.**

Rack mount safety considerations

- Rack loading—Overloading or uneven loading of racks may result in shelf or rack failure, possibly damaging the equipment and causing personal injury. Stabilize racks in a permanent location before loading begins. Mount the components starting at the bottom of the rack, then work to the top. Do not exceed your rack's load rating.

- Power considerations—Connect only to the power source specified on the unit. When you install multiple electrical components in a rack, ensure that the total component power ratings do not exceed the circuit capabilities. Overloaded power sources and extension cords present fire and shock hazards.

- Elevated ambient temperature—If installed in a closed rack assembly, the operating temperature of the rack environment may be greater than the room ambient temperature. Use care not to exceed the 45°C (113°F) maximum ambient temperature of the switch.

- Reduced air flow—Install the equipment in the rack so that the amount of airflow required for safe operation of the equipment is not compromised.

- Reliable earthing—Maintain reliable earthing of rack-mounted equipment. Pay particular attention to the supply connections other than the direct connections to the branch circuit, for example, use of power strips.

- Do not mount the equipment with the back panel facing downward.

One-half U front-rack installation

Install the S5212F-ON switch using the following installation instructions.

ⓘ **NOTE: To install the S5232F-ON, S5248F-ON, and S5224F-ON switches, see** One U ReadyRails installation**. To install the S5296F-ON switch, see** Two U four-post rack assembly**.**

The dual-tray mounting rails ship with the dual tray, not with the switch. You must supply eight rackmount screws for this installation.

To install the one-half U switch:

- Attach the rails to the dual tray.
- Install the dual tray in the four-post rack.
- (Recommended) Attach the ground cable to the switch.
- Install the switch in the dual tray.

ⓘ **NOTE: Do not install the dual tray in a two-post rack.**

1   Remove the dual tray and the rails from the shipping packaging and place them on a clean antistatic surface.
2   Line up the three holes on the inner switch rail with the dual-tray mounting heads.
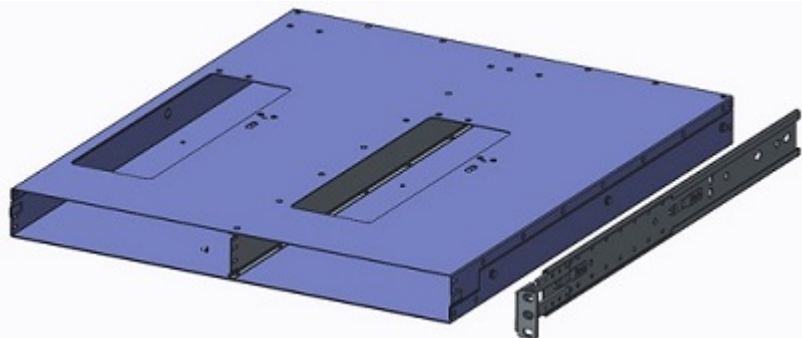
3   Attach the rail to the dual tray. Slide the rail back until it locks into place.

4   Repeat with the other side.
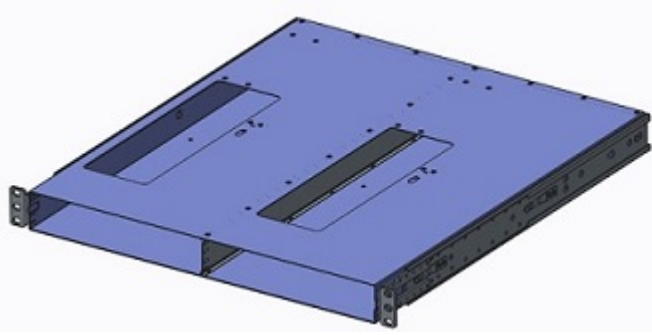
5   Install the dual tray inside the four-post rack. Rackmount screws are not included.

6   Attach the front dual-tray switch rails to the four-post rack from the front. Secure the dual tray to the rack using two user-supplied screws for each rack post.
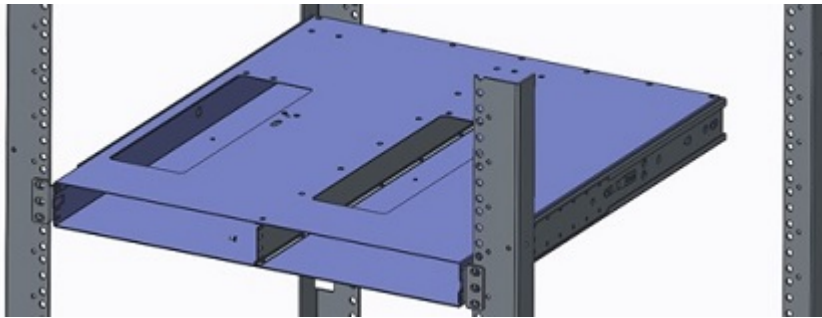
7   Attach the rear dual-tray switch rails to the four-post rack from the rear. Secure the dual tray to the rack using two user-supplied screws for each rack post.
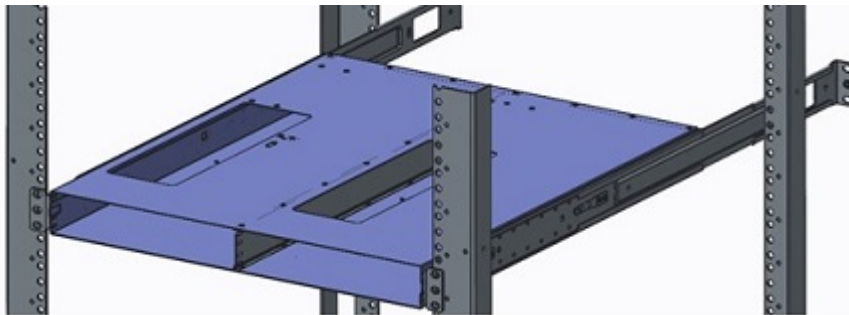
8   Tighten all mounting screws to securely mount the dual tray into the four-post rack.
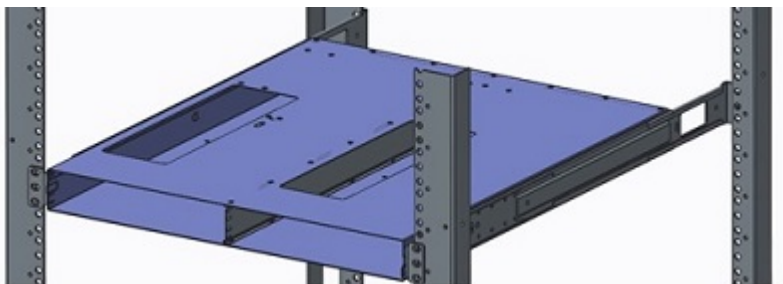
One-half U switch installation

Install one or two half-U switches in the four-post rack-mounted dual tray.

1   Install one switch into either dual-tray slot from the front.
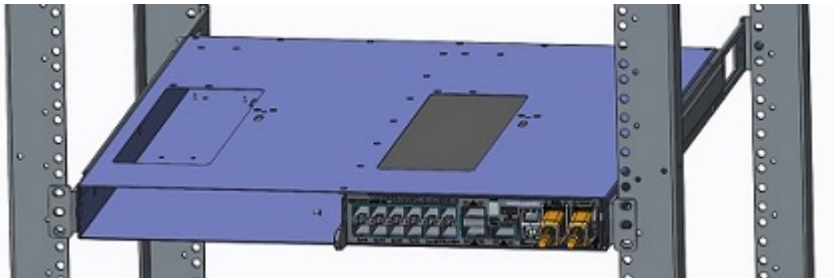
2   Insert the second switch in the open dual-tray slot if you are installing two switches.
    The switch is fully inserted when it presses the stop features on the dual tray. The front switch latch snaps the switch into place.

    Close-up view of the stop at the back of the switch.
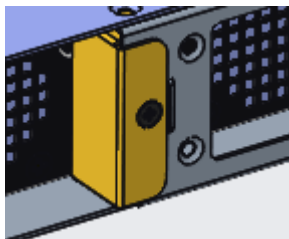
One-half U switch removal

Remove the S5212F-ON switch using the following instructions:

ⓘ **NOTE: To remove the S5232F-ON, S5248F-ON, S5296F-ON, or S5224F-ON switch, see** One U ReadyRails installation**. To remove the S5296F-ON switch, see** Two U four-post rack assembly**.**

Push in the front switch latches according to the latch arrows and pull out the switch.
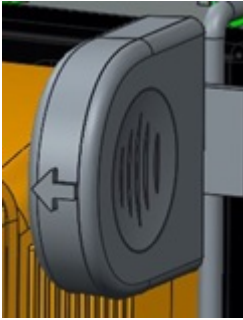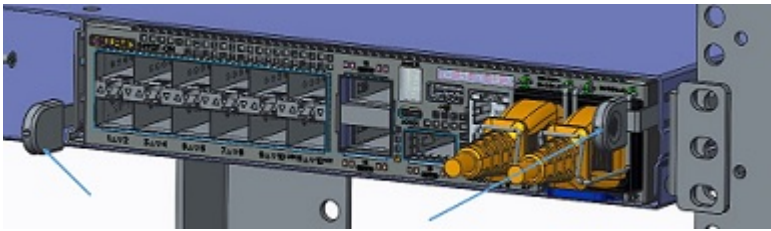
One U ReadyRails installation

S5224F-ON, S5248F-ON, and S5232F-ON switches, you can install the ReadyRails system using the 1U tool-less square-hole method or one of three possible 1U threaded round-hole methods. The tooled installation methods include two-post flush mount, two-post center mount, or four-post threaded mount.

ⓘ NOTE: **Do not use the ReadyRails system for the S5212F-ON and S5296F-ON switches. For the S5212F-ON switch installation instructions, see** One-half U front-rack installation**. For the S5296F-ON switch installation instructions, see** Two U four-post rack assembly**.**

To begin installation, separate each rail assembly by sliding the inside rail out of the outside rail.

ⓘ NOTE: **For more installation instructions, see the installation labels attached to the rail assembly.**
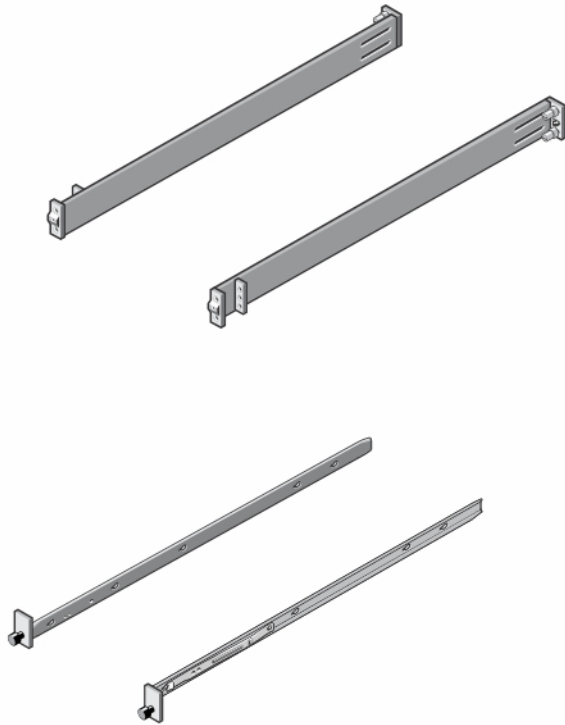
1U Tool-less mount installation

ⓘ **NOTE: For more installation instructions, see the installation labels attached to the rail assembly.**

1   Face the ReadyRails flange ears facing outward. Place one rail between the left and right vertical posts. Align and seat the back flange rail pegs in the back vertical post flange.

The center extractions show how the pegs appear in both the square and nonthreaded round holes.
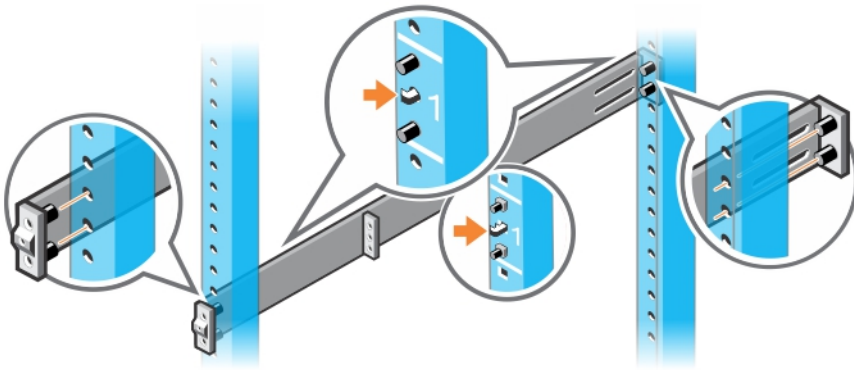
2   Align and seat the front flange pegs in the holes on the front side of the vertical post.

> ⓘ NOTE: **Be sure that the rails click into place and are secure.**

3   Repeat this procedure for the second rail.

To remove each rail, pull on the latch release on each flange ear and unseat each rail.

Two-post flush-mount installation

> ⓘ NOTE: **For more installation instructions, see the installation labels attached to the rail assembly.**

1   Remove the latch castings from the front side of each ReadyRails assembly, item 1.

To remove the two screws from each front flange ear on the switch side of the rail and remove each latch casting, use a Torx screwdriver. Retain the latch castings for future rack requirements. It is not necessary to remove the back flange castings.
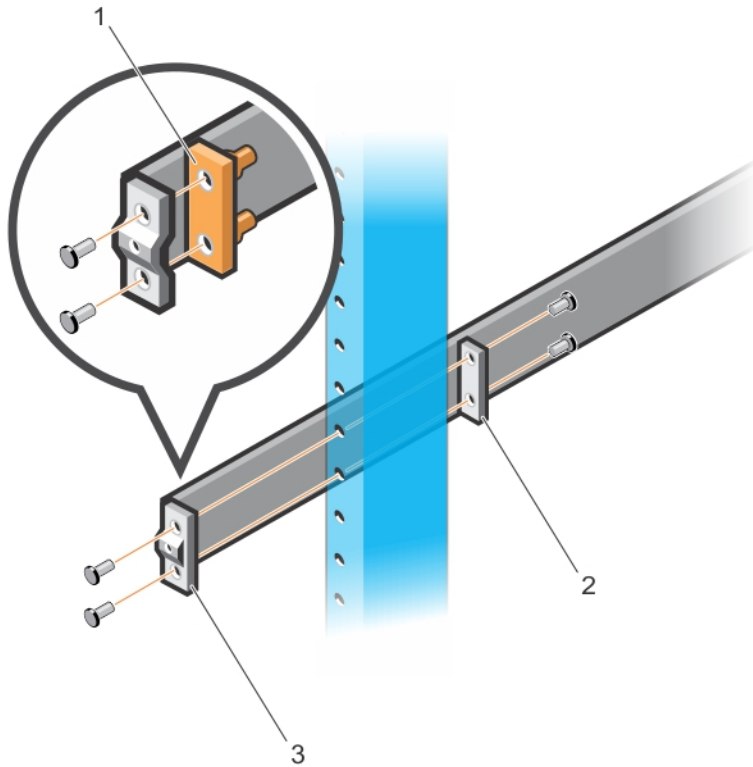
2   Attach one rail to the front post flange with two user-supplied screws, item 2.

3   Slide the plunger bracket forward against the vertical post and secure the plunger bracket to the post flange with two user-supplied screws, item 3.

4   Repeat this procedure for the second rail.

Two-post center-mount installation

ⓘ | **NOTE: For more installation instructions, see the installation labels attached to the rail assembly.**

1   Slide the plunger bracket rearward until it clicks into place and secure the bracket to the front post flange with two user-supplied screws, item 1.
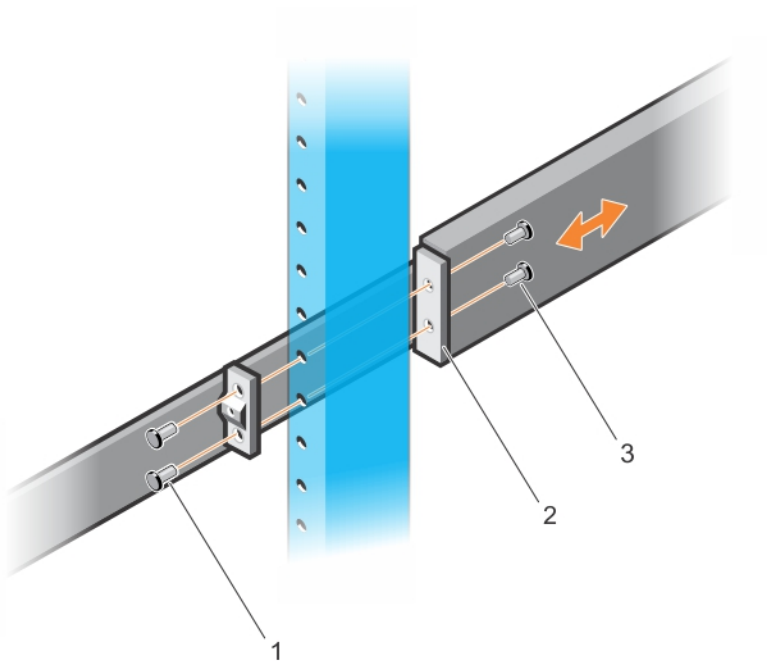
2   Slide the back bracket towards the post. Secure it to the post flange with two user-supplied screws, items 2 and 3.

3   Repeat this procedure for the second rail.

Four-post threaded installation

ⓘ | **NOTE: For more installation instructions, see the installation labels attached to the rail assembly.**

1   Remove the latch castings from each end of the ReadyRails assemblies. To remove the two screws each latch casting, use a Torx driver.

    Retain the latch castings for future rack requirements.
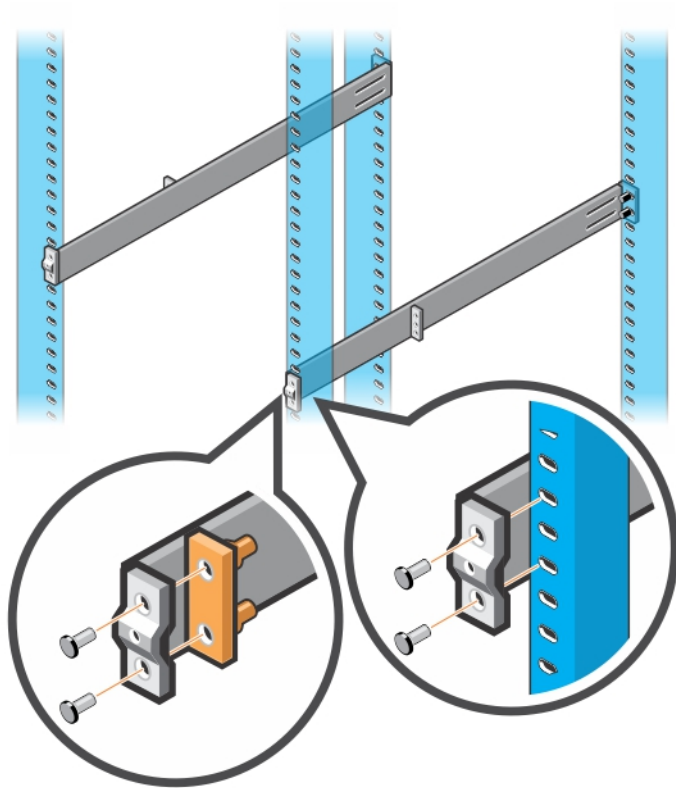
2   For each rail, attach the front and back flanges to the post flanges with two user-supplied screws at each end.

Switch installation

For the 1U two-post configurations for the S5224F-ON, S5248F-ON, and S5232F-ON switches, slide the switch into the rails in the same manner as the four-post configurations.

For the S5212F-ON switch installation, see One-half U front-rack installation. For the S5296F-ON switch installation, see Two U four-post rack assembly.

1U front-rack installation

Configure the rails that are attached to the switch.

ⓘ | **NOTE: For more instructions, see the installation instruction labels on the rail.**

1   Attach the inner switch rails to the S5200F-ON Series switch.

Line up the rail with the mounting heads and attach the rail to the switch.

Slide the rail back until it locks into place. The following shows the detail of the front standoff with the locking tab:
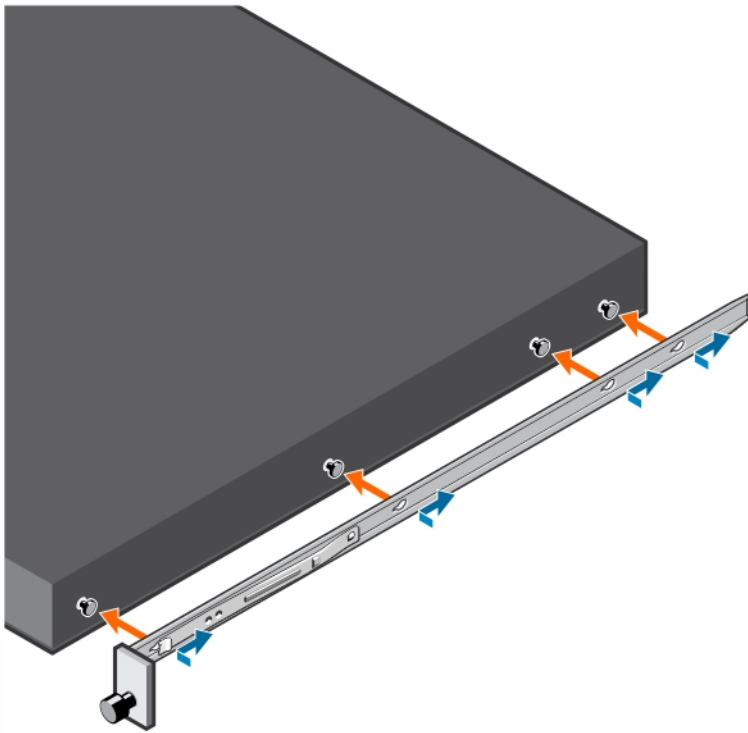
2   Line up both switch rails with the previously mounted rack ReadyRails and slide the switch in until it is flush with front of rack.

To keep the switch from inadvertently sliding out of the rack and falling, about 3 inches before you fully insert your switch, the rail locking feature engages.
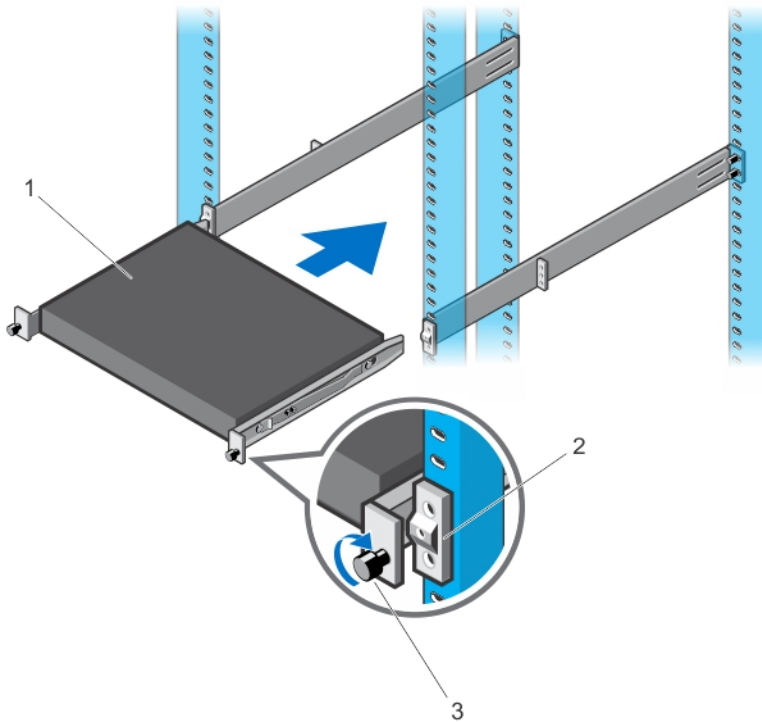
> (i) NOTE: **Do not the use the mounted ReadyRails as a shelf or a workplace.**

3   Tighten the two thumbscrews and rack screws.

To remove the switch from the rack or cabinet, press in the two side-release bars on the switch simultaneously and slide the switch forward.

Two U four-post rack assembly

Due to the chassis weight, the S5296F-ON switch does not support a two-post rack installation; you must install the S5296F-ON in a four-post rack.

> (i) NOTE: **To install the S5212F-ON switch, see One-half U front-rack installation. To install the S5224F-ON, S5232F-ON, or S5248F-ON, switch see, One U ReadyRail installation.**

To install in a four-post rack, follow the instructions in your rack frame kit. In a four-post rack, the maximum distance between the front and back vertical posts is 36 inches (91.44 cm); the minimum distance is 24 inches (60.96).

> ⚠ CAUTION: **Use two people, an equipment lift, or pallet jack when lifting or moving the chassis. Install the chassis into the rack before inserting the chassis components. Lift the chassis only from the bottom. Lifting by the chassis shelves or power supply openings might damage the chassis.**

Four-post rack mount

Rack mounting safety considerations

> ⚠ WARNING: **To prevent bodily injury when mounting or servicing this unit in a rack, take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**
>
> •   If your chassis is the only unit in the rack, mount it at the bottom of the rack.
> •   When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
> •   If the rack comes with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
> •   If the chassis ships with blanks, remove the blanks from each slot before lifting the chassis.

> ⚠ WARNING: **These instructions are a condensed reference. Read the safety instructions in your *Safety, Environmental, and Regulatory* information booklet before you begin.**

> (i) NOTE: **The illustrations in this document are not intended to represent a specific switch.**

Rack mount safety considerations

•   Rack loading—Overloading or uneven loading of racks may result in shelf or rack failure, possibly damaging the equipment and causing personal injury. Stabilize racks in a permanent location before loading begins. Mount the components starting at the bottom of the rack, then work to the top. Do not exceed the load rating of your rack.

•   Power considerations—Connect only to the power source specified on the unit. When you install multiple electrical components in a rack, ensure that the total component power ratings do not exceed the circuit capabilities. Overloaded power sources and extension cables present fire and shock hazards.

•   Elevated ambient temperature—If you install the switch in a closed rack assembly, the operating temperature of the rack environment may be greater than the room ambient temperature. Use care not to exceed the 45ºC (113ºF) maximum ambient temperature of the switch.

•   Reduced airflow—Do not compromise the amount of airflow that is required for safe operation of the equipment. Install the equipment in the rack so that the equipment constantly has the correct amount of airflow surrounding it.

•   Reliable earthing—Maintain reliable earthing of rack-mounted equipment. Pay particular attention to the supply connections other than the direct connections to the branch circuit, for example: use of power strips.

•   Do not mount the equipment with the fan panel facing in the downward position.

Switch Installation and removal

1   Align the system with the rails, and slide the system into the rack.

2   Tighten the screws on each side of the switch front panel. See items 1 and 2 in the following illustration:

To remove the system from the rack, loosen the screws and slide the system out of the rack.
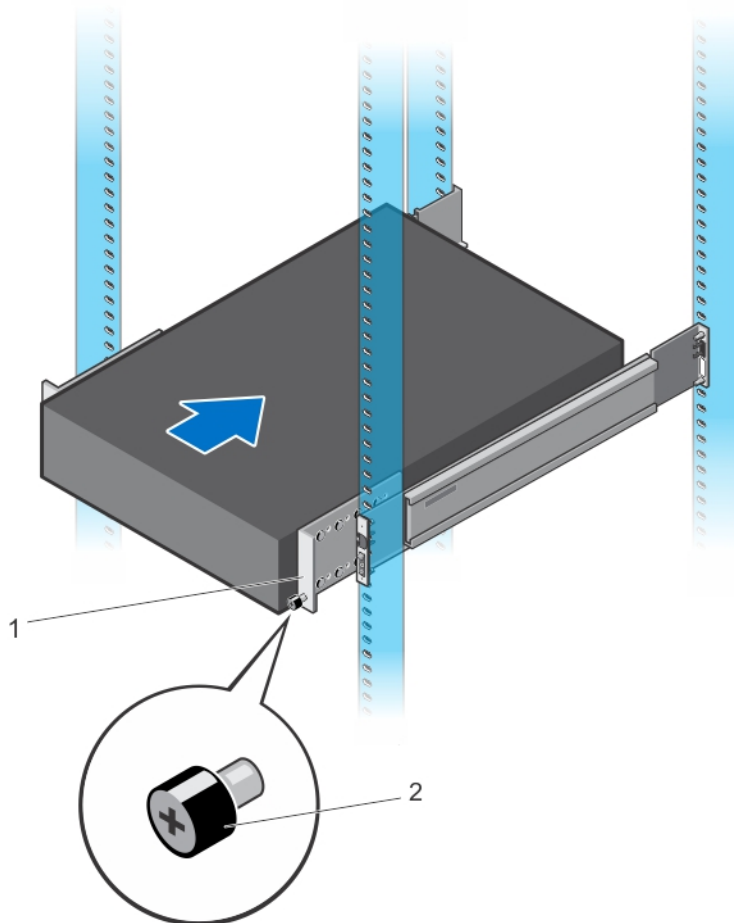
DC power connections

ⓘ NOTE: Use the following instructions for all S5200F-ON Series switches except for the S5212F-ON switch. To connect DC power to the S5212F-ON switch, see S5212F-ON only DC power connections.

Each DC powered system comes with a set containing a prewired (3-inch 8AWG) power supply connector and a four-screw wiring block, as shown. One set is provided for each DC PSU.
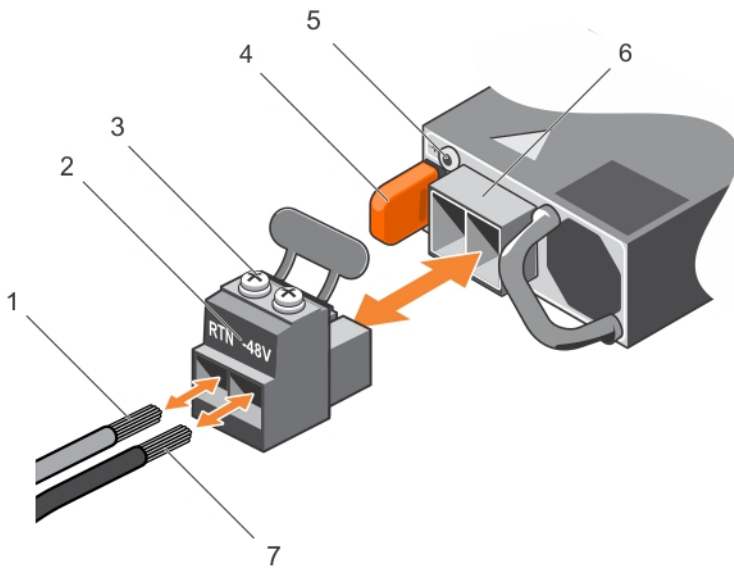
1	DC wire RTN	2	DC power connector
3	Captive screws (2)	4	Orange tab
5	PSU status LED	6	DC power socket
7	DC wire -48V		

The DC power connector ground:
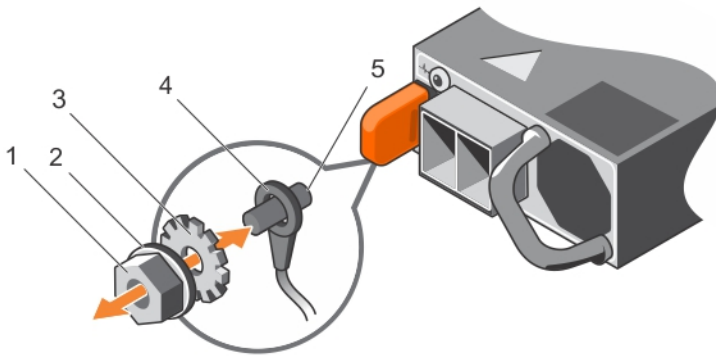
1	Ground nut	2	Washer
3	Lock washer	4	Ground cable
5	Device grounding rod		

To connect a DC PSU to the site's DC power source:

1   Strip 1/2 inches of insulation from each of the power connector's wires, as shown.

2   Insert each of the power connector's bare wire lengths into the wiring block, as shown.

3   Use a flat-blade screwdriver to tighten the screws that secures the bare wires into the wiring block.

4   Secure the site's DC power source wires to the other side of the wiring block (See steps 1 and 3).

5   Insert the DC power connector into the power socket of the DC PSU. Ensure that the connector pins firmly seat and you hear the click of the power connector's left and right levered clamps lock into place.

⚠ **WARNING: Never try to force the power connector into or out of the DC PSU power socket.**

ⓘ **NOTE: To remove the power connector from a DC PSU, squeeze the levers on both sides of the connector. Doing so disengages the power connector's clamps. While continuing to squeeze, pull the power connector from the DC PSU socket.**

S5212F-ON only DC power connections

ⓘ **NOTE: Use the following instructions for the S5212F-ON switch only. For all other S5200F-ON Series switches, see DC power connections.**

Each DC PSU comes with a connector cable. One cable is provided for each DC PSU.
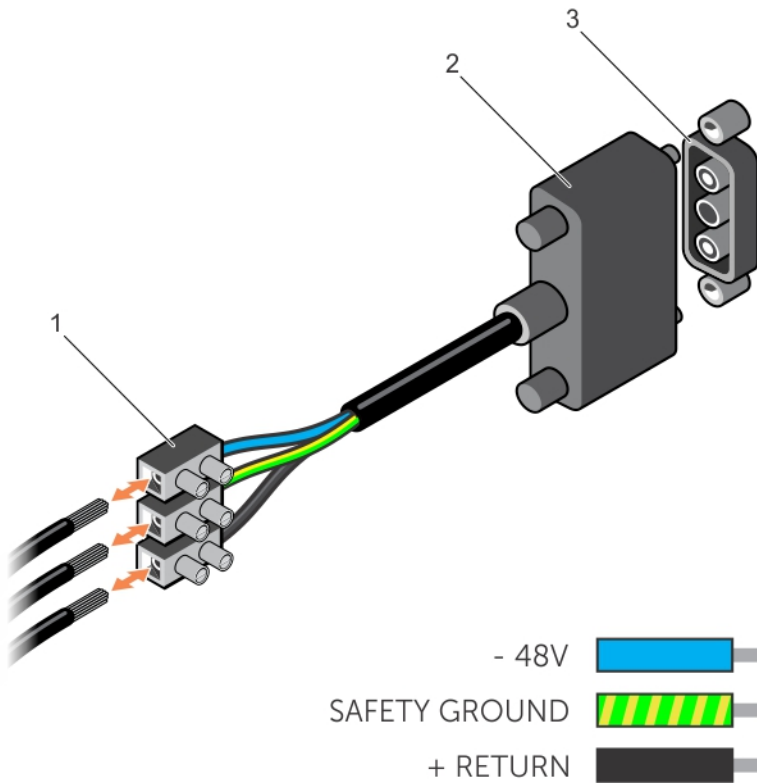
1	Wiring block	2	Power connector
3	PSU connector		

1   Strip a 1/2 inch section of insulation from each of the power connector's wires, as shown.

2   Insert each of the power connector's bare wire lengths into the wiring block. The blue wire is -48V, the black wire is the positive return, and the yellow/green wire is the ground wire, as shown.

3   Use a flat-blade screwdriver to tighten the screws that secures the bare wires into the wiring block.

4   Secure the site's DC power source wires to the other side of the wiring block, see steps 1 and 3.

⚠ **WARNING: Do not cross the wires.**

5   Insert the DC power connector into the power socket of the DC PSU. Ensure that the connector pins firmly seat and you hear the click of the power connector's left and right levered clamps lock into place.

⚠ **WARNING: Never try to force the power connector into or out of the DC PSU power socket.**

ⓘ **NOTE:** To remove the power connector from a DC PSU, unscrew the thumb screws and pull the power connector from the DC PSU socket.

Optics installation

The S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switches have SFP+, SFP28, QSFP-DD, and QSFP28 optical ports.

For a list of supported optics, see the specification sheets at www.dell.com/support or contact your Dell EMC Sales representative.

⚠ **CAUTION: ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S5200F-ON Series switch and components.**

⚠ **WARNING: When working with optical fibers, follow all warning labels and always wear eye protection. Never look directly into the end of a terminated or unterminated fiber or connector as it may cause eye damage.**

1   Position the optic to enter the port correctly.

The optic has a key that prevents it from being inserted incorrectly.

2   Insert the optic into the port until it gently snaps into place.

> ⓘ **NOTE: When you cable the ports, be sure not to interfere with the airflow from the small vent holes above and below the ports.**

Optics removal

Remove an optic by pushing the tab on the optic and sliding the optic from the port.

When removing optics with direct attach cables (DACs) from the port, pull the release tab firmly and steadily. Before pulling the release tab, you may need to gently push the optic into the port to ensure that it is seated properly. Do not jerk or tug repeatedly on the tab.

Switch start up

Supply power to the S5200F-ON Series switch after it is mounted in a rack or cabinet.

Dell EMC recommends reinspecting your switch before powering it up. Verify the following:

- Optional: The equipment is properly secured to the rack and properly grounded.
- Optional: The equipment rack is properly mounted and grounded.
- The ambient temperature around the unit, which may be higher than the room temperature, is within the limits that are specified for the S5200F-ON Series switch.
- There is sufficient airflow around the unit.
- The input circuits are correctly sized for the loads and that you use sufficient overcurrent protection devices.

⚠ **CAUTION: Do not start up the switch if a fan module is not installed.**

ⓘ **NOTE: A US AC or DC power cable is included for powering up an AC or DC power supply. You must order all other power cables separately.**

ⓘ **NOTE: ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S5200F-ON Series switch and components.**

Start up sequence

When the switch powers up, the fans immediately come on at high speed. The fan speed slows as the switch continues to boot up.

After switch placement

After you have securely installed and powered on the S5200F-ON Series switch:

- For switch documentation and resources, see the Dell EMC Networking Hardware Platforms and OS9 Info Hub.
- For OS10 Networking operating system documentation and resources, see the Dell EMC Networking OS10 Info Hub.
- For ONIE documentation and resources, see ONIE information at www.onie.org.

Switch replacement

The following steps describe removing and replacing a switch with an identical replacement switch. For further assistance when replacing a switch, contact your Dell EMC support representative.

ⓘ **NOTE: Some steps do not apply if you are replacing a different switch or non-Dell EMC switch.**

ⓘ **NOTE: ESD damage can occur when components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the switch and accessories. After you remove the original packaging, place the switch and components on an anti-static surface.**

1   Back up the switch configuration to your back-up computer or laptop TFTP server.

    copy running-config tftp://hostip/filepath

2   Disconnect the power source.
3   Label and remove all cables.
4   Remove the switch from the rack.

    At the same time, press in the two side-release bars on the switch and slide the switch forward.

    If you are using the fan trays or PSUs in the replacement switch, remove them from the switch.

5   Unpack the new switch.

    For more information, see Unpack.

6   Install the new switch in your rack or cabinet.

    For detailed installation instructions, see S5200F-ON Series switch installation.

    If you are using the fan trays or PSUs from the removed switch, reinsert them in the replacement switch.

7   Power on the switch.

    For more information, see Switch power up.

8   Establish a connection to the switch CLI.
9   Confirm that the software version of the replacement switch is the same as the previously installed switch.

    show os-version

    If the software versions do not match, upgrade the replacement switch software using the procedure included with the firmware download.

10 Copy the backed-up switch configuration to the new switch.

    copy tftp://hostip/filepath running-config

11 Connect all the cables.

Power supplies

The S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, or S5212F-ON) switch ships with two AC or DC power supplies. The two power supplies have two air-flow directions—from the I/O to the PSU and from the PSU to the I/O.

Two PSUs are required for full redundancy, but the switch can operate with a single PSU.

For all switches except the S5212F-ON switch, the PSUs are field replaceable. When running with full redundancy—two power supplies installed and running—you can remove and replace one PSU without disrupting traffic. For the S5212F-ON switch, the PSUs are fixed.

⚠ **CAUTION: To prevent electrical shock, ensure that the S5200F-ON Series switch is grounded properly. If you do not ground your equipment correctly, excessive emissions may result. Use a qualified electrician to ensure that the power cables meet your local electrical requirements.**

ⓘ **NOTE: NOTE: Connect the power supply to the appropriate branch circuit protection as defined by your local electrical codes. Verify that the remote power source complies with the switch input power specifications.**

ⓘ **NOTE: If you use a single PSU, install a blank plate in the other PSU slot. Use power supply 2 (PSU2) as the blank plate slot. To install the blank plate, use a #1 Philips screw driver.**

ⓘ **NOTE: ESD damage can occur if components are mishandled. Always wear an ESD-preventive wrist or heel ground strap when handling the S5200F-ON Series switch and components.**

Topics:

- Components
- AC or DC power supply installation
- Power cable clip installation

Components

The following power supply options are available for the S5200F-ON Series switch:

- AC or DC power supply with integrated fan
- AC or DC power supply with integrated reverse flow fan, except S5212F-ON
- S5212F-ON only: AC or DC open-frame power supply without integrated fans

For the S5224F-ON, S5232F-ON, and S5248F-ON switches, power supply 1 (PSU1) is on the left side of the switch; power supply 2 (PSU2) is on the right side of the switch. For the S5212F-ON and S5296F-ON switches, both power supply 1 (PSU1) and power supply 2 (PSU2) are on the right side of the switch.

The S5224F-ON, S5232F-ON, or S5248F-ON PSUs:

1	PSUs

The S5296F-ON PSUs:
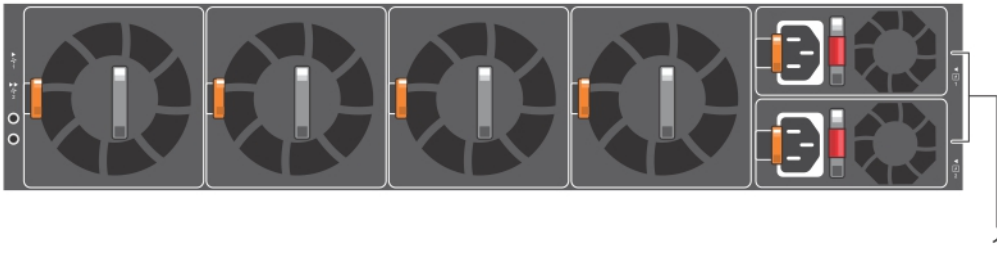
1	PSUs

The S5212F-ON AC PSUs:

1	AC PSUs

The S5212F-ON DC PSUs:
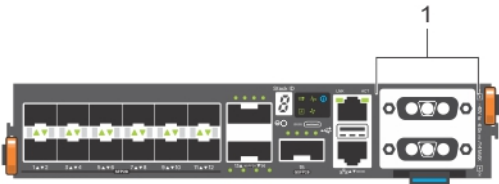
1	DC PSUs

The PSUs have an integrated fan, which you cannot replace individually; if the fan integrated in a PSU fails, you must replace the entire PSU. You can replace the fan trays individually. For fan tray replacement procedures, see Fans.

⚠ **WARNING: Prevent exposure and contact with hazardous voltages. Do not attempt to operate this switch with the safety cover removed.**

⚠ **CAUTION: Remove the power cable from the PSU before removing the PSU. Also, do not connect the power cable before you insert the PSU in the switch.**

ⓘ **NOTE: To comply with the GR-1089 Lightning Criteria for Equipment Interfacing with AC or DC Power Ports, use an external surge protection device (SPD) at the AC or DC input of the router.**

PSU LEDs

- Solid green—Input is OK.
- Flashing yellow—There is a fault with the PSU.
- Flashing green blink at 1Hz—Switch is in a standby/CR state.
- Off—PSU is off.

AC or DC power supply installation

ⓘ **NOTE: The PSU slides into the slot smoothly. Do not force a PSU into a slot as this action may damage the PSU or the switch.**

ⓘ **NOTE: Ensure that you correctly install the PSU. When you install the PSU correctly, the power connector is on the left side of the PSU.**

ⓘ **NOTE: If you use a single PSU, install a blank plate in the other PSU slot. If you are only using one power supply, install the power supply in the first slot, PSU1. Install a blank plate in the second slot, PSU2.**

1 Remove the PSU slot cover from the S5200F-ON Series switch using a small #1 Phillips screwdriver.
2 Remove the PSU from the electro-static bag.
3 Insert the PSU into the switch PSU slot—insert the exposed PSU connector first.
   The PSU slot is keyed so that you can only fully insert the PSU in one orientation. When you install the PSU correctly, it snaps into place and is flushed with the back of the switch.
4 Plug in the appropriate AC 3-prongs cable from the switch PSU to the external power source.
5 Repeat steps 1 through 4 if you have a redundant PSU using the second PSU slot on the S5200F-ON Series switch.
   S5224F-ON, S5232F-ON, or S5248F-ON switch PSU:
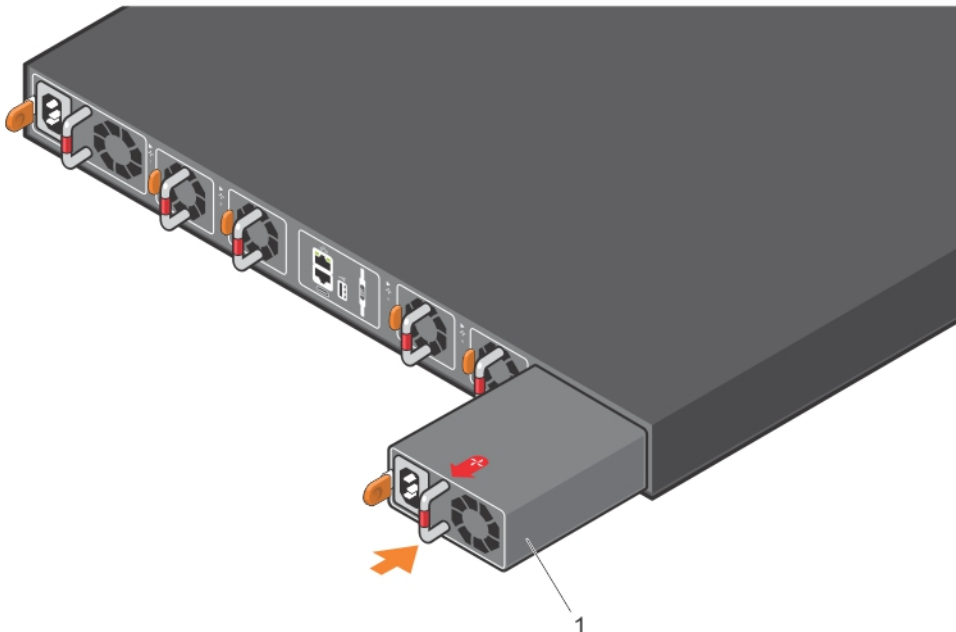
- 1--PSU1 is on the right side of the switch. PSU2 is on the left side of the switch.

S5296F-ON switch PSU:
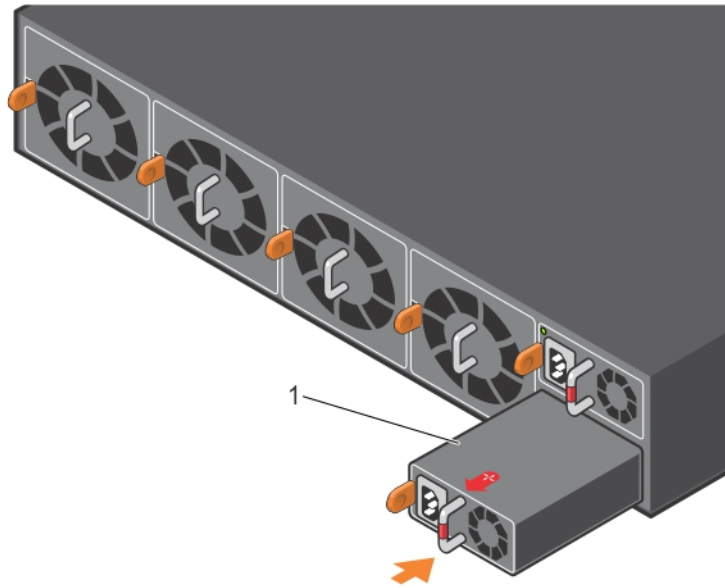
- · 1--PSU

> (i) NOTE: The S5200F-ON Series switch starts up when you connect the cables between the power supply and the power source.

AC or DC power supply replacement

⚠ CAUTION: Disconnect the power cable before removing the power supplies. Also, disconnect all power cables before servicing.

(i) NOTE: The PSU slides into the slot smoothly. Do not force a PSU into a slot as this action may damage the PSU or the S5200F-ON Series switch.

(i) NOTE: If a PSU fails, you must replace the entire unit. There are no field serviceable components in the PSU. To request a hardware replacement, see Dell EMC support.

(i) NOTE: If you use a single PSU, install a blank plate in the other PSU slot. If you are only using one power supply, install the power supply in the first slot, PSU1. Install a blank plate in the second slot, PSU2.

1 Disconnect the power cable from the PSU.
2 Use the grab handle to slide the PSU out of the power supply bay.
3 Use the grab handle on the replacement PSU to slide it into the power supply bay.
4 Attach the power cables to the replacement PSU.

> (i) NOTE: The switch powers up when the cables are connected between the power supply and the power source.

Power cable clip installation

Your switch ships with two wire power cable clips. The following describes how to install the power cable clips that secure the power cables in place.
There are two loop holes above each power outlet on the switch. Connect the power cable clip above the right-most power outlet first.

1 Insert the right side of one of the power cable clips into the right hole above the right-most power outlet.
2 Twist the power cable clip to insert the left side of the power cable clip into the left hole above of the same power outlet.

 You may need to twist the power cable clip slightly to get the power cable clip fully inserted into the holes above the power outlet.

3   Repeat the installation procedure with the second power cable clip on the second power outlet.

4   Insert the power cords into the power outlets.

5   Push the power cable clips over the power cables to secure them into place.

Fans

The S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch comes from the factory with two PSUs and four fan modules installed in the switch. For all switches except the S5212F-ON, the fan modules and the power supplies, which have integrated fans, are hot-swappable. For the S5212F-ON, the fans are fixed.

In addition to the power supply modules, you can order and install fan modules separately.

The S5200F-ON Series switch supports two airflow direction options. Do not mix airflow types in a switch; you can use only a single airflow direction in a switch. If the airflow directions are mismatched, *you must correct the mismatched airflow direction*.

- Airflow is from the I/O panel to the PSU—the red indicator is the normal airflow direction.
- Airflow is from the PSU to the I/O panel—the blue indicator is the reverse airflow direction.

All fans and PSUs in a configuration must be in the same airflow direction.

Environmental factors can decrease the amount of time required between fan replacements. Check the environmental factors regularly. An increase in temperature and/or particulate matter in the air might affect performance—for example, new equipment installation).

⚠ **CAUTION: Check the fans at six-month intervals and replace them as necessary. Regularly monitor the speeds of the fans to accurately determine replacement intervals.**

Topics:

Components

The following are the S5200F-ON Series switch fan components:

- S5200F-ON Series switch fan module
- S5200F-ON Series switch fan module—reverse flow

The S5224F-ON, S5232F-ON, or S5248F-ON switch fan modules:
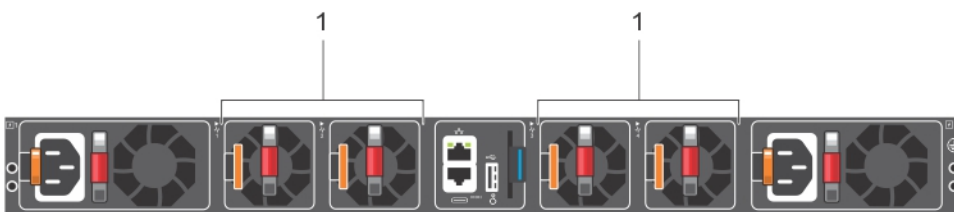
1   Fans

The S5296F-ON switch fan modules:
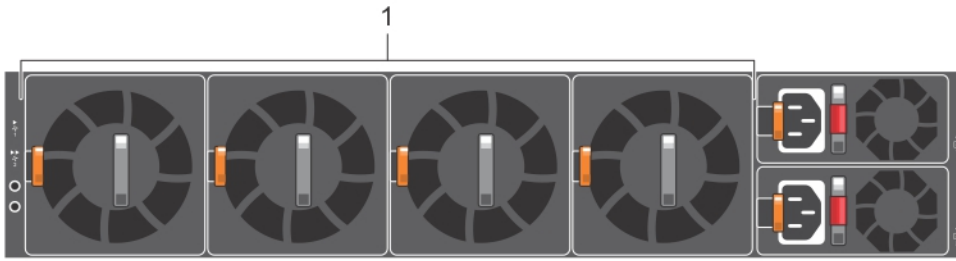
1   Fans

The S5212F-ON switch fan modules:
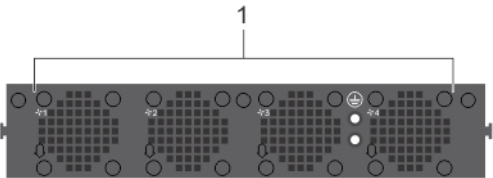
1   Fans

Fan LEDs

- Solid green—Fan function is normal.
- Flashing yellow—There is a fan fault.
- Off—Fan is off.

Fan module installation

For all switches except the S5212F-ON, the fan modules in the S5200F-ON Series switch are field replaceable. For the S5212F-ON switch, the fans are fixed. For the S5224F-ON, S5232F-ON, and S5248F-ON switches, fan module slots 1 and 2 are on the left side of the switch and fan module slots 3 and 4 are on the right side of the switch. For the S5296F-ON switch, fan module slots 1 through 4 are on the left side of the switch. For the S5212F-ON switch, the fans are across the entire switch.

⚠ CAUTION: **DO NOT mix airflow directions. All fans must use the same airflow direction—reverse or normal. If you mix the airflow direction, to avoid damage to the switch,** *you must correct the mixed airflow.*

1   Take the fan module out of the shipping box.
2   Slide the module into the bay.

     The S5224F-ON, S5232F-ON, or S5248F-ON switch fan module installation:
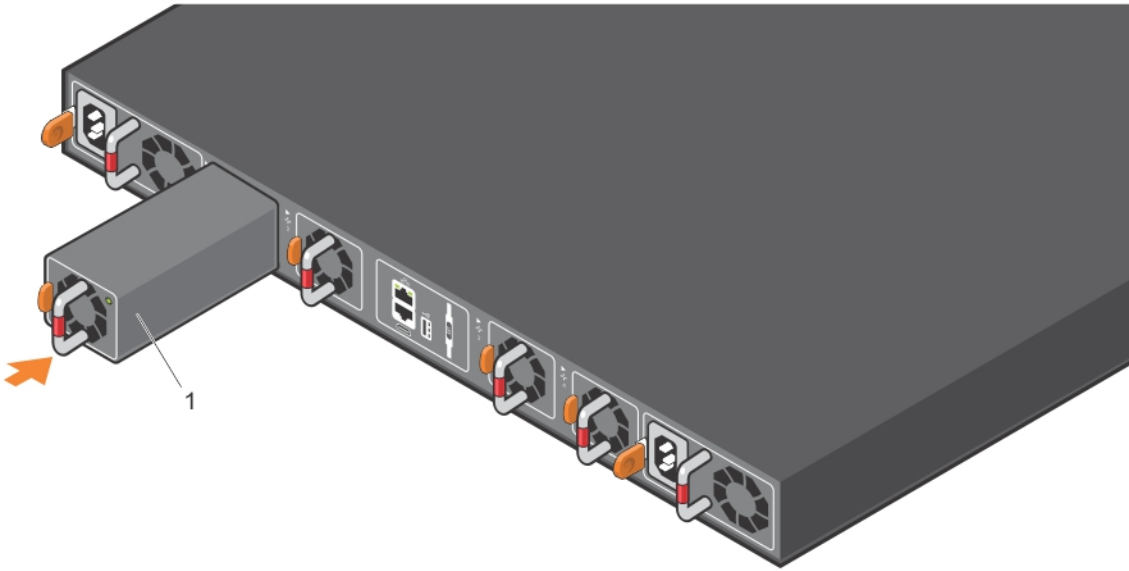
- 1—fan module

The S5296F-ON switch fan module installation:
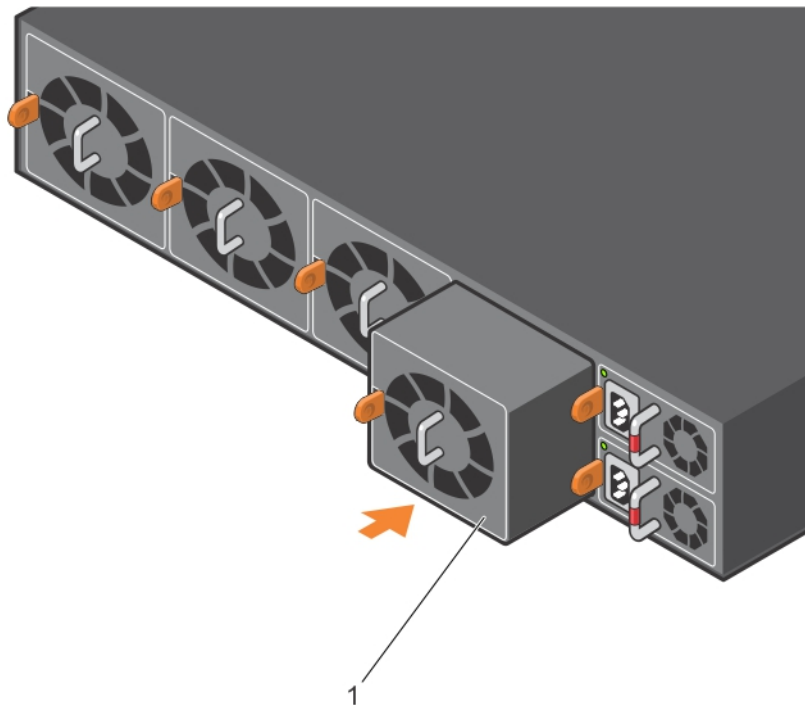
- 1--fan module

Fan module replacement

To request a hardware replacement, see Dell EMC support.

⚠ **CAUTION: Complete the following steps within one minute or the switch temperature could rise above safe thresholds and the switch could shut down:**

1   Take the replacement fan module out of the shipping box.
2   Slide the installed fan module out of the bay.
3   Slide the replacement module into the bay.

Management ports

The S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch provides three ports for management and one USB flash drive mount for file transfers.

> (i) **NOTE: The output examples in this section are for reference only. Your output may vary.**

Topics:

- RJ45 console port access
- MicroUSB-B console port access
- USB storage mount
- Before you install an OS
- Check your switch
- ONIE service discovery

RJ45 console port access

For the S5224F-ON, S5232F-ON, and S5248F-ON switches, the management ports are on the PSU-side of the switch. For the S5212F-ON and S5296F-ON switches, the management ports are on the I/O-side of the switch.

The S5224F-ON, S5232F-ON, or S5248F-ON switch management ports:
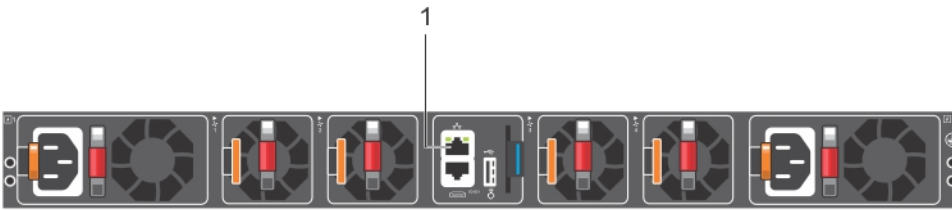
1	Out-of-band management port (top); RJ45 console port (bottom)

The S5296F-ON switch management ports:

1	Out-of-band management port (top); RJ45 console port (bottom)

The S5212F-ON AC switch management ports:

1	Out-of-band management port (top); RS-232 console port (bottom)

The S5212F-ON DC switch management ports:

1	Out-of-band management port (top); RJ45 console port (bottom)

ⓘ **NOTE: When connecting the RJ45 console to the patch panel or terminal server using Cat5e or Cat6 Ethernet cables, the maximum cable length is 100m. However, if the Ethernet cable is disconnected from the patch panel or terminal server but connected to the RJ45 console, the maximum cable length is 6m. If the cable is longer than 6m when disconnected from the panel or server, your switch may not boot.**

ⓘ **NOTE: Ensure that any equipment that is attached to the serial port can support the required 115200 baud rate.**

ⓘ **NOTE: If the serial port on your computer cannot accept a female DB-9 connector, use a DB-9 to USB adaptor.**

1   Install the provided RJ45 connector-side of the provided cable into the switch console port.
2   Install the DB-9 female-side of the provided copper cable into the serial port on your computer.

    Or install the DB-9 cable into other data terminal equipment (DTE) server hardware.
3   Use the following settings to make the serial port connection:
    - 115200 baud rate
    - No parity
    - Eight data bits
    - One stop bit
    - No flow control

MicroUSB-B console port access

The MicroUSB-B console port is on the I/O side of the switch.

ⓘ **NOTE: The S5200-ON Series switches use the Silicon Labs CP2102 USB-B chip. To find the correct USB-B universal asynchronous receiver-transmitter (UART) driver, see https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers.**

When you connect the microUSB-B port, it becomes the primary connection and, while connected, all messages are sent to the microUSB-B port.

(i) **NOTE:** Before starting this procedure, be sure that you have a terminal emulation program already installed on your PC. Install the appropriate drivers to support the microUSB-B port. To download Dell EMC drivers, see **www.dell.com/support**. If your computer requires non-Dell EMC drivers, contact Dell EMC Technical Support for assistance.

1 Power on the PC.

2 Connect the USB-A end of cable into an available USB port on the PC.

3 Connect the microUSB-B end of cable into the microUSB-B console port on the switch.

4 Power on the switch.

5 Install the necessary USB device drivers.

To download Dell EMC drivers, see www.dell.com/support. If your computer requires non-Dell EMC drivers, contact Dell EMC Technical Support for assistance.

6 Open your terminal software emulation program to access the switch.

7 Confirm that the terminal settings on your terminal software emulation program are as follows:

- 115200 baud rate
- No parity
- 8 data bits
- 1 stop bit
- No flow control

USB storage mount

USB storage does not automatically mount. USB storage supports the FAT file system. To use USB storage, first mount the device using the following steps:

1 Start up the switch.

2 Press **Enter** on the **ONIE rescue mode** menu option from the ONIE Grub boot loader.

3 Create a mount directory for the USB storage.

```
ONIE:/ # mkdir /mnt/usb
```

4 View the fixed disks using the `fdisk` command.

```
ONIE:/mnt # fdisk -l
```

For internal storage:

```
Disk /dev/sda: 15.8 GB, 15829303296 bytes
255 heads, 63 sectors/track, 1924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device Boot      Start         End      Blocks   Id System
/dev/sda1               1        1925    15458303+  ee EFI GPT
```

For USB storage:

```
Disk /dev/sdb: 30.9 GB, 30942946304 bytes
64 heads, 32 sectors/track, 29509 cylinders
Units = cylinders of 2048 * 512 = 1048576 bytes

   Device Boot      Start         End      Blocks   Id System
```

5 Mount the device `/dev/sdb` to the `/mnt/usb` directory.

```
ONIE:/ # mount -t vfat /dev/sdb /mnt/usb
```

> (i) **NOTE:** If the `/mnt/usb` directory is missing, the following message displays: `mount: mounting /dev/sdb on /mnt/usb failed: No such file or directory.`

> (i) **NOTE:** If the USB device is not seen, the following message displays: `mount: mounting /dev/sdb on /mnt/usb failed: No such device or address.`

Before you install an OS

After powering on the S5200F-ON Series switch, it goes through a power-on self-test (POST).

POST runs every time the switch is initialized and checks the hardware components to determine if the switch is fully operational before booting. After POST, the switch uses the Grub bootloader.

To select an entry, use the up and down arrow keys. Press **Enter** to select an OS or enter `e` to edit the commands before booting. Enter `c` for a command line. The selected entry runs automatically in the operating system.

Grub bootloader example

```
GNU GRUB   version 2.02~beta2+e4a1fe391

 +------------------------------------------------+
 |*ONIE: Install OS                               |
 | ONIE: Rescue                                   |
 | ONIE: Uninstall OS                             |
 | ONIE: Update ONIE                              |
 | ONIE: Embed ONIE                               |
 | EDA-DIAG                                       |
 |                                                |
 +------------------------------------------------+
```

Your switch comes with ONIE installed.

ⓘ **NOTE:** To access ONIE, use the RJ45 or MicroUSB console port.

ONIE example

```
ONIE: Install OS
    For downloading and installing an OS from a URL
    Starts ONIE with ONIE Discovery Service
    (factory default boot)
ONIE: Rescue
    Starts ONIE without ONIE Discovery Service
    Useful for running Diagnostics manually
ONIE: Uninstall OS
    Restore to factory defaults erases any installed OS
ONIE: Update ONIE
    For downloading and updating ONIE from a URL
ONIE: Embed ONIE
    For downloading and updating ONIE from a URL and erases any installed OS
```

During the initial setup, the switch boots to ONIE Install. ONIE Install boots with ONIE Discovery to the console, `ONIE:`.

ⓘ **NOTE:** For more information, see the *Open Networking Hardware Diagnostic Guide* at **www.dell.com/support**.

ⓘ **NOTE:** After you have securely installed and powered on the S5200F-ON Series switch, to configure your switch, see your third-party ONIE-compatible OS or the Dell EMC OS documentation.

Check your switch

To confirm that ONIE is working properly, use the `onie-sysinfo` command. Run the `onie-sysinfo` command at the ONIE prompt.

```
ONIE:/ # onie-sysinfo x86_64-dell_<platform>_c25
```

ONIE:/ # onie-sysinfo –c (Machine arch)

```
x86_64
ONIE:/ # onie-sysinfo –v (ONIE Version programmed)
3.23.1.0
ONIE:/ #
ONIE:/ # uname -a
Linux onie 3.2.35-onie+ #1 SMP Tue Dec 9 17:08:16 PST 2014 x86_64 GNU/Linux ONIE:/ #
ONIE:/ # lspci
00:00.0 Class 0600: 8086:1f0c
00:01.0 Class 0604: 8086:1f10
00:02.0 Class 0604: 8086:1f11
00:03.0 Class 0604: 8086:1f12
00:0e.0 Class 0600: 8086:1f14
00:0f.0 Class 0806: 8086:1f16
00:13.0 Class 0880: 8086:1f15
00:14.0 Class 0200: 8086:1f41
00:14.1 Class 0200: 8086:1f41
00:14.2 Class 0200: 8086:1f41
00:16.0 Class 0c03: 8086:1f2c
6:1f22 lass 0106: 8086:1f32
00:1f.0 Class 0601: 8086:1f38
00:1f.3 Class 0c05: 8086:1f3c
01:00.0 Class 0200: 14e4:b960  (NPU PCI detection)
01:00.1
ONIE:/ #
```

ONIE service discovery

ONIE attempts to locate the installer through several discovery methods.

To download and run an installer, the ONIE Service Discovery feature follows these steps in order and uses the first successful method found:

1   Search locally attached storage devices for one of the ONIE default installer filenames—for example, `onie self update` from the USB.
2   Discover TFTP-based image from the DHCP server.
3   Query to the IPv6 link-local neighbors using HTTP for an installer.

ONIE `ifconfig eth0` command examples

If none of the ONIE Service Discovery methods are successful, you can disable this using the `onie-discovery-stop` command.

You can install an operating system manually from HTTP, FTP, or TFTP using the `onie-nos-install <URL>` command.

> (i) | NOTE: If you have a recovery USB plugged into your switch, you must remove it before using the `onie-nos-install` command.

The ONIE Install environment uses DHCP to assign an IP address to the management interface—eth0. If that fails, it uses the default IP address 192.168.3.10/255.255.255.0.

To display the IP address, use the `ifconfig eth0` command, as shown.

ONIE:/ # ifconfig eth0
```
eth0 Link encap:Ethernet HWaddr 90:B1:1C:F4:9C:76
 inet addr:10.11.53.33 Bcast:10.255.255.255 Mask:255.0.0.0
 inet6 addr: fe80::92b1:1cff:fef4:9c76/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:18 errors:0 dropped:0 overruns:0 frame:0
 TX packets:24 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000
 RX bytes:1152 (1.1 KiB) TX bytes:6864 (6.7 KiB)
 Interrupt:21 Memory:ff300000-ff320000
```

To assign an IP address to the management interface, eth0, and verify network connectivity, use the `ifconfig eth0 <ip address>` command, as shown.

ONIE:/ # ifconfig eth0 10.11.53.33/16 UP

```
Verify the network connection with ping.
```
ONIE:/ # ping 10.11.8.12
```
PING 10.11.8.12 (10.11.8.12): 56 data bytes
64 bytes from 10.11.8.12: seq=0 ttl=62 time=1.357 ms
64 bytes from 10.11.8.12: seq=1 ttl=62 time=0.577 ms
^C
```

Specifications

This section lists the S5200F-ON Series (S5232F-ON, S5248F-ON, S5296F-ON, S5224F-ON, and S5212F-ON) switch specifications.

⚠ **CAUTION: Operate the product at an ambient temperature not higher than 45ºC (113ºF).**

⚠ **CAUTION: Lithium battery Caution: There is a danger of explosion if the battery is incorrectly replaced. Replace only with same or equivalent type of battery. Dispose of the batteries according to the manufacturer's instructions.**

ⓘ **NOTE: For RoHS information, see Restricted Material Compliance.**

Topics:

- Chassis physical design
- IEEE standards
- Agency compliance
- USA Federal Communications Commission statement
- European Union EMC directive conformance statement
- Japan VCCI compliance for class A equipment
- Korean certification of compliance
- Safety standards and compliance agency certifications
- Electromagnetic compatibility
- Product recycling and disposal

Chassis physical design

Table 7. Chassis physical design

Parameter	Specifications
Height	S5232F-ON: 1.72 inches (43.6 mm)
	S5248F-ON: 1.72 inches (43.6 mm)
	S5296F-ON: 3.42 inches (87 mm)
	S5224F-ON: 1.72 inches (43.6 mm)
	S5212F-ON: 1.72 inches (43.6 mm)
Width	S5232F-ON: 17.1 inches (434 mm)
	S5248F-ON: 17.1 inches (434 mm)
	S5296F-ON: 16.6 inches (422 mm)
	S5224F-ON: 17.1 inches (434 mm)
	S5212F-ON: 7.87 inches (199.8 mm)

Parameter	Specifications
Depth	S5232F-ON: 18.1 inches (460 mm)
	S5248F-ON: 18.1 inches (460 mm)
	S5296F-ON: 20.1 inches (511 mm)
	S5224F-ON: 18.1 inches (460 mm)
	S5212F-ON: 16 inches (406.4 mm)
Chassis weight with factory-installed components	S5232F-ON: 21.6 lbs (9.8 kg)—PSUs and fans
	S5248F-ON: 21.4 lbs (9.7 kg)—PSUs and fans
	S5296F-ON: 33.3 lbs (15.1 kg)—PSUs and fans
	S5224F-ON: 21.4 lbs (9.7 kg)—PSUs and fans
	S5212F-ON: 10.05 lbs (4.5 kg)—PSUs and fans
Rack clearance required	Front: 5 inches (12.7 cm)
	Back: 5 inches (12.7 cm)

Table 8. Environmental parameters

Parameter	Specifications
Operating temperature	0° to 45°C (32°F to 113°F) continuously
	(i) **NOTE: Reduce maximum temperature by 1°C/125 meters (1°F/228 feet) above 950 meters (3,117 feet).**
Operating humidity	5% to 85% (RH), non-condensing
Storage temperature	−40° to 70°C (−40° to 158°F)
Storage humidity	5% to 90%, non-condensing
Maximum thermal output	S5232F-ON: 635W = 2167 BTU/Hr
	S5248F-ON: 647W = 2208 BTU/Hr
	S5296F-ON: 893W = 3047 BTU/Hr
	S5224F-ON: 455W = 1552 BTU/Hr
	S5212F-ON: 304W = 1037 BTU/Hr
Maximum operational altitude	10,000 feet (3,048 meters)
Maximum non-operational altitude	39,370 feet (12,000 meters)
Shock	Dell EMC Spec SV0115

Table 9. AC power requirements

Parameter	Specifications
Power supply	S5232F-ON: 100–240 VAC 50/60 Hz

Parameter	Specifications
	S5248F-ON: 100–240 VAC 50/60 Hz
	S5296F-ON: 100–240 VAC 50/60 Hz
	S5224F-ON: 100-240 VAC 50/60 Hz
	S5212F-ON: 100-240 VAC 50/60 Hz
Maximum current draw per system	S5232F-ON: 5.8A@110VAC and 2.4A@220VAC
	S5248F-ON: 5.8A@110VAC and 2.4A@220VAC
	S5296F-ON: 8.2A@110VAC and 4.1A@220VAC
	S5224F-ON: 4.2A@110VAC and 2.1A@220VAC
	S5212F-ON: 2.8A@110VAC and 1.4A@220VAC
Maximum power consumption	S5232F-ON: 635W maximum
	S5248F-ON: 647W maximum
	S5296F-ON: 893W maximum
	S5224F-ON: 455W maximum
	S5212F-ON: 304W maximum
Typical power consumption	S5232F-ON: 490W typical
	S5248F-ON: 420W typical
	S5296F-ON: 607W typical
	S5224F-ON: 280W typical
	S5212F-ON: 208W typical

Table 10. DC power requirements

Parameter	Specifications
Minimum and maximum input voltage range	−40VDC minimum
Maximum current at full load with fan	S5232F-ON: 15.9A @40VDC
	S5248F-ON: 16.2A @40VDC
	S5296F-ON: 22.3A @40VDC
	S5224F-ON: 11.4A@40VDC
	S5212F-ON: 7.6A@40VDC

IEEE standards

The S5200F-ON Series switch complies with the following IEEE standards.

- 802.1ab (LLDP)

- 802.1ax (Layer 2)
- 802.1d, 802.1w, 802.1s, 802.1x (Mgmt/Security), 802.3x (Layer 2)
- 802.3 (1000BASE-KX)
- 802.3ba (40GbE and 100GbE ports)

Agency compliance

The S5200F-ON Series switch is designed to comply with the following safety and agency requirements:

India

This product conforms to the relevant *Essential Requirements of Telecommunication Engineering Centre (TEC)* regulations.

USA Federal Communications Commission 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 EMC 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.

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.

Figure 2. Canadian Department of Communication Statement

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 EMC 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 EMC option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 32/ CISPR34 and EN55032 / EN55034. 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, you may be required to take adequate measures.**

European Community Contact

Dell EMC, EMEA - Central

Dahlienweg 19

66265 Heusweiler

Germany

Tel: +49 172 6802630

Email: EMEA Central Sales

Japan VCCI compliance for class A equipment

Class A information statement for VCCI 32 -1:2016

この装置は、クラスA機器です。この装置を住宅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
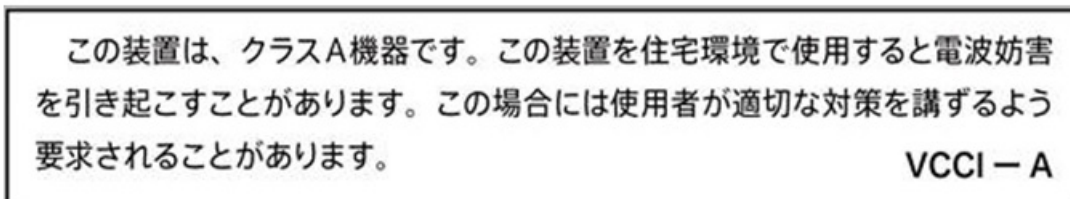要求されることがあります。   VCCI－A

Figure 3. Japan: VCCI compliance for class A equipment

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: **Use the AC power cords with Dell EMC equipment only. Do not use Dell EMC AC power cords with any unauthorized hardware.**
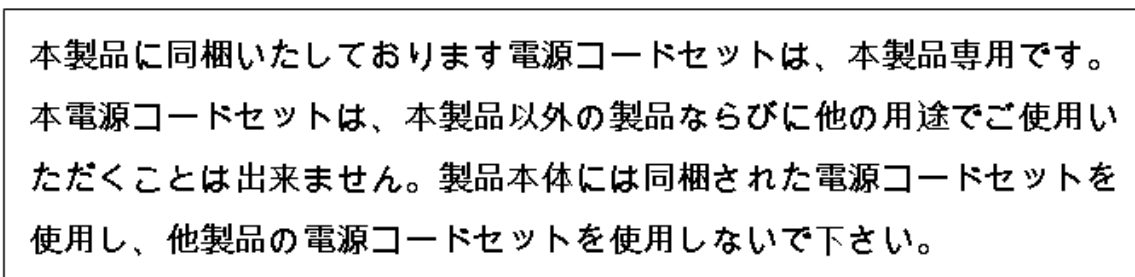
本製品に同梱いたしております電源コードセットは、本製品専用です。
本電源コードセットは、本製品以外の製品ならびに他の用途でご使用い
ただくことは出来ません。製品本体には同梱された電源コードセットを
使用し、他製品の電源コードセットを使用しないで下さい。

Figure 4. Japan: warning label

Korean certification of compliance

A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Figure 5. Korean certification of compliance

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

Figure 6. Korean package label

Safety standards and compliance agency certifications

- CUS UL 60950-1, 2nd Edition
    - Meets or exceeds Hi Pot and Ground Continuity testing per UL 60950-1.
- CSA 60950-1-03, 2nd Edition
- EN 60950-1, 2nd 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
- IEC 60950-1, 2nd Ed, including all National Deviations and Group Differences
- IEC 62368-1

Electromagnetic compatibility

Emissions

- International: CISPR32: Class A
- Australia/New Zealand: AS/NZS CISPR 32: Class A
- Canada: ICES-003, Issue-4, Class A
- Europe: EN55032: CISPR 32: Class A
- International: CISPR 32: Class A
- EN55032
- Japan: VCCI V-3/2011.04, Class A
- Korea: KN32, Class A
- Taiwan: CNS13438, Class A
- USA: FCC CFR47 Part 15, Subpart B, Class A

Immunity

- EN 300 386 v2.1.1 (2016-07) EMC for Network Equipment
- EN 55024 + A1 + A2
- 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
- EN 61000-6-1
- EN 61000-4-11 Voltage Dips/Interruptions

Product recycling and disposal

You must recycle or discard this switch according to applicable local and national regulations. Dell EMC encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Dell EMC 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 EMC 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 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.

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

For information on Dell EMC product recycling offerings, see the WEEE Recycling instructions on Support. For more information, contact the Dell EMC Technical Assistance Center.

Dell EMC support

The Dell EMC support site provides documents and tools to help you effectively use Dell EMC equipment and mitigate network outages. Through the support site you can obtain technical information, access software upgrades and patches, download available management software, and manage your open cases. The Dell EMC support site provides integrated, secure access to these services.

To access the Dell EMC support site, go to www.dell.com/support/. To display information in your language, scroll down to the bottom of the web page and select your country from the drop-down menu.

- To obtain product-specific information, enter the 7-character service tag, known as a luggage tag, or 11-digit express service code of your switch and click **Submit**.

  To view the chassis service tag or express service code, pull out the tag or enter the `show chassis` command from the CLI.

- To receive additional kinds of technical support, click **Contact Us**, then click **Technical Support**.

To access product documentation and resources that might be helpful to install, configure, and troubleshoot the specific Dell EMC Networking switch, see the Dell EMC Networking Hardware Platforms and OS9 Info Hub.

To search for drivers and downloads, go to www.dell.com/drivers/.

To participate in Dell EMC community blogs and forums, go to www.dell.com/community.