DS1000 Installation Guide

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Revision History

This section lists the summary of changes corresponding to each release.

Release	Date	Change Summary
1.0.0	2/2024	New document
1.1.0	12/2024	Added Revision History

DS1000 Installation Guide

This reference document provides important legal disclaimers and notices for DS1000 products.

Disclaimer

Celestica may update product specifications or information without prior notice to enhance reliability, functionality, or design. Although the provided information is believed to be accurate, no responsibility is assumed for its use, or for any infringements of patents or third-party rights.

Preface

Document Scope

This installation guide details the design features of, and provides instructions for the DS1000 Ethernet switch.

Intended Audiences

- System architects
- Firmware engineers
- System application engineers

Document Conventions

The following table describes various types of notes used within this installation guide.

Type	Generalized Definition
ⓘ NOTE:	Provides supplemental information.
⚠ CAUTION:	Indicates a situation that if not avoided, may result in equipment damage or minor to moderate injury.
ⓟ TIP:	Indicates information that helps you make better use of your system.
⚠ WARNING:	Indicates a hazardous situation that if not avoided, could result in data loss or serious injury.
ⓘ DANGER:	Indicates a hazardous situation that if not avoided, will result in death or serious injury.

DS1000 Product Overview

This document describes the general hardware design of the DS1000 Ethernet switch.

An Open Compute Project (OCP) accepted design, the DS1000 Ethernet switch offers 48 x 10/100/1000Mbps RJ45 ports and 8 SFP+ ports within a 1U form factor.

Optimized for:

- GbE Data Center Top of Rack
- Enterprise Edge/Access
- Management Switch Use Cases

Product Specifications

Type	DS1000
Depth	370 mm
Height	43.6 mm
Width	438.5 mm
Weight	7.1Kg
Power Input (VAC)	
Power Consumption (W)	<100W
Operating Temperature (airflow front to back)	5 - 40 °C
Operating Temperature (airflow back to front)	5 - 40 °C
Operating Relative Humidity	40 - 60 %
Storage Temperature	-40 - 70 °C
Storage Relative Humidity	5 - 95 %

Networking Capabilities

ACL

The DS1000 Ethernet switch supports comprehensive ACL policies. Traffic can be classified by source/destination IP addresses, source/destination MAC addresses, IP protocols, TCP/UDP, IP precedence, time ranges and ToS. Various policies can be conducted to forward the traffic. The DS1000 Ethernet switch also supports IEEE802.1x port-based access authentication, which can be deployed with RADIUS, to ensure port level security and block illegal users.

QoS

DS1000 fully supports the DiffServ module. Users can specify a queue bandwidth on each port. WRR/SP/SWRR scheduling is also supported. DS1000 supports port security. Users can deploy trusted CoS, DSCP, IP precedence and port priority. Traffic can be classified by port, VLAN, DSCP, IP precedence and ACL table. Users can also modify packets' DSCP, COS, and IP precedence values. Users can specify different bandwidths for voice/data/video to customize different qualities of service.

MPLS Ready

DS1000 supports LDP and MPLS VPN which can be used in metropolitan area networks and wide area networks.

Features

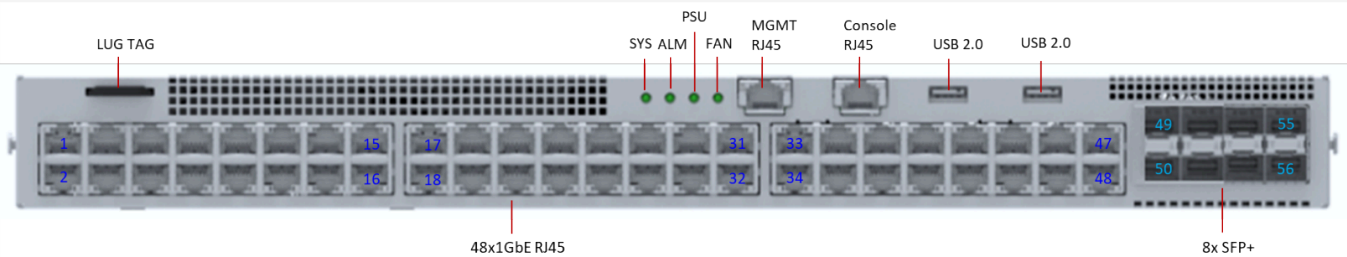
- 1U Form factor
- 48 x 10/100/1000Base-T RJ45 Copper ports, 8 x SFP+ 10Gigabit fiber ports, 1 x Console Port base on RJ45, 1 x Out of band management port base on 10/100/1000Mbps RJ45, 2 x Type A USB 2.0 port
- Intel Denverton 4-Core; 4GB ECC DDR4, configurable to 32GB; 64Gb iSLC M.2 configurable SSD
- ONIE installer to support third-party network operating systems
- Under 200W peak consumption, 1+1 redundant hot swap PSUs; 90-264VAC 47Hz/63Hz AC/DC PSU
- Excess of 150,000 hours

Table 1.Network Standards, Protocols, and Interfaces

DS1000	Supported Technologies
Standards	802.1d/w/s, 802.1Q, 802.1p, 802.3ad, 802.3x, GVRP, DHCP and SNTP
Protocols	IGMP, DVMRP and PIMRIPv1/2, OSPF and IPv6
Interfaces	1x console port, 1x management port, 2x Type A USB 2.0 ports

Product Orientation

Figure 1. DS1000 Front Panel View



ⓘ NOTE: The USB port supports data transmission only. It does not supply power.

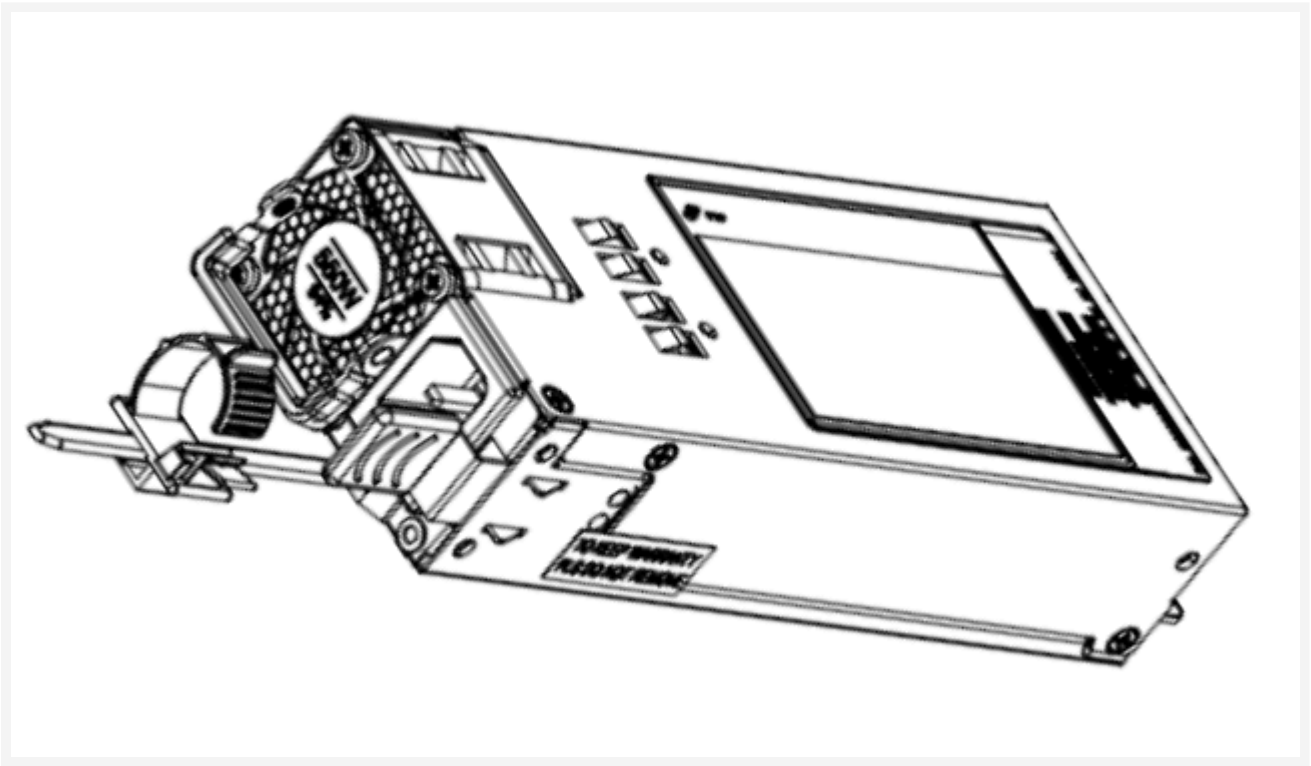
ⓘ NOTE: The user can perform local and telnet configuration through this port. The console port supports asynchronous mode, 8 data bits, 1 stop bit, no parity bit. The default baud rate is 115200 bps.

Figure 2. Rear Panel View

Power Supply Unit (PSU)

There are two PSUs in the DS1000 Ethernet switch supporting two airflow options: Front-to-Back (F2B) and Back-to-Front (B2F). Each PSU's maximum output power is 550W with an output voltage of 12VDC +/- 5%. Each PSU includes a fan and a handle at the back of the power supply to support hot plug pull-out and insertion.

Figure 3. PSU



Safety Precautions

Read this section before beginning any procedure. For your safety and the proper maintenance and operation of the DS1000, please follow these precautions when setting up this device.

- Follow all cautions and instructions marked on the equipment.
- Ensure the voltage and frequency of your power source match the voltage and frequency noted on the system's electrical rating label.
- Never insert any objects through openings in the chassis. Dangerous voltages, and/or moving parts may be present. Conductive external objects could produce a short circuit that could damage the system or cause electric shock, resulting in serious personal injury.
- In order to not exceed operational temperature guidelines, do not block or cover the openings of your system. Never place a product near a radiator or heat register. Failure to follow these guidelines may cause overheating and affect the reliability of the device.
- Do not drop the product or subject it to physical shock.
- Keep liquids away from the system.
- When shipping the product, pack it inside the original or equivalent packaging and ship on a pallet.
- Celestica does not assume any responsibility for problems caused by unauthorized repairs or replacement.
- Keep flammable items away from the product.
- Inspect and maintain the site and the system regularly. Failure to do so may reduce the lifespan of this system and possibly void the warranty.

⚠ CAUTION:

The Celestica DS1000 does not produce or have any laser-related functions. If you connect and install a device that supports laser functions such as an optical transceiver, we recommend that you choose a product certified to the relevant standards as shown below.

- EN 60825-1, 1st Edition
- EN 60825-1 Safety of Laser Products — Part 1: Equipment Classification Requirements and Users' Guide
- EN 60825-2 Safety of Laser Products — Part 2: Safety of Optical Fiber Communication Systems
- FDA Regulation 21CFR 1040.10 and 1040.11

Power

Depending on the type of power system your device has, the following symbols may be used.

On - Connects power to the system. This can be AC or DC power depending on product and model.

Off - Disconnects power to the system.

Standby - The power switch is in standby mode (low power).

⚠ CAUTION: Please check the input to ensure proper grounding of the power supply unit (PSU) before powering on the system.

⚠ CAUTION: Improper power supply system grounding, extreme fluctuation of the input source, and transients (spikes) can result in data errors, or even hardware damage.

⚠ CAUTION: The product may be equipped with multiple power supplies. To remove all hazardous voltages, disconnect all power cords.

⚠ CAUTION: This device is designed to work with power systems having a grounded neutral or a grounded return for direct current (DC) powered products. To reduce the risk of electric shock, do not plug the chassis into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

⚠ CAUTION: The system may have more than one power supply cable. To reduce the risk of electrical shock, a trained service technician must disconnect all power supply cables before servicing the system.

ⓘ NOTE:

This symbol  is used when multiple power supplies are installed in a system. This warning label is typically found on the back of the device near the PSU.

Power Connection

Installation of this equipment must comply with local and regional electrical regulations governing the installation of information technology equipment by licensed electricians. For electrical power ratings on options, refer to the power rating label or the user documentation supplied with that option.

⚠ CAUTION: Do not use the power cord provided with your equipment with any other products. Only use the power cord(s) provided with the product to power it. Do not use household extension cords with your product.

ⓘ NOTE: To disconnect power, remove all power cords from unit.

ATTENTION: DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION

POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

WARNUNG: Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.

当心：如要切断电源，请将全部电源线都从机器上拔掉。

當心：如要切斷電源，請將全部電源線都從機器上拔掉

Environmental Requirements

Please read and familiarize yourself with the following requirements.

- The switch must be installed in a clean, dust-free environment. Otherwise, the device may be damaged by electrostatic adherence.
- Maintain the temperature @airflow front to back within 5 - 40 °C, and humidity within 40 - 60 %.
- The device must work in the range of AC power input: .
- The device must be installed in a dry and cool place. Leave sufficient spacing around the device for good air circulation.
- The device must be well grounded in order to avoid electrostatic discharge (ESD) damage and physical human injury.
- Avoid direct sunlight and keep the chassis away from heat and strong electromagnetic interference sources.

Dust and Particles

Dust is harmful to the operation of the DS1000.

Dust may lead to electrostatic adherence, especially under low relative humidity, resulting in poor contact of metal connectors or contacts. Electrostatic adherence may result in reduced product lifespan and increased chance of communication failures. The recommended value for dust content and particle diameter in the site is shown below.

Table 2.Environmental Requirements: Dust

Max Diameter (μm)	0.5	1	3	5
Max Density (particles/m³)	1.4×10^5	7×10^5	2.4×10^5	1.3×10^5

Airborne salt, acid and sulfide are also harmful to the device. Such harmful gases will aggravate metal corrosion and the aging of some parts. The site should avoid harmful gases, such as SO2, H2S, NO2, NH3 and Cl2, etc. The table below details the threshold values.

Table 3.Environmental Requirements: Particles

Gas	Average (mg/m³)	Max (mg/m³)
SO_2	0.2	1.5
H_2S	0.006	0.03
NO_2	0.04	0.15
NH_3	0.05	0.15
Cl_2	0.01	0.3

Temperature and Humidity

Although DS1000 is designed to use multiple internal fans, the site should still maintain appropriate temperature and humidity. High-humidity conditions may cause increased electrical resistance and degradation of mechanical properties and corrosion of internal components. Extreme low relative humidity may cause the insulation spacer to contract, making the fastening screw insecure. Furthermore, in dry environments, static electricity is liable to be produced and cause harm to internal circuits. Temperature extremes may cause reduced reliability and premature aging of insulation materials, thus reducing the working lifespan of the Ethernet switch.

Table 4.Environmental Requirements: Temperature and Humidity

Temperature (airflow front to back):		Relative Humidity	
Long-term condition	Short-term condition	Long-term condition	Short-term condition
5 - 40 °C	5 - 45 °C	40 - 60 %	5 - 90 %

Temperature (airflow back to front):		Relative Humidity	
Long-term condition	Short-term condition	Long-term condition	Short-term condition
5 - 40 °C	5 - 45 °C	40 - 60 %	5 - 90 %

ⓘ NOTE: A sample of ambient temperature and humidity should be taken at 1.5m above the floor and 0.4m in front of the rack, with no protective panel covering the front and rear of the rack. Short term working conditions refer to a maximum of 48 hours of continued operation and an annual cumulative total of less than 15 days. Adverse operation conditions refer to the ambient temperature and relative humidity value that may occur during an air-conditioning system failure, and normal operation conditions should be recovered within 5 hours.

Environmental Requirements Tables

Table 5.Operating Environment Specifications

Temperature and Temperature Gradient		
Operating Reliability Requirement	Ambient	0 to 40° C
	Max Temperature Gradient	20° C per hour
Non-Operating Reliability Requirement	Ambient Non-Operating	-40 to 65 ° C

Regulatory Information

FCC (US)

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.

> ⓘ NOTE: 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 designed 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, and if it is not installed and used in accordance with the instruction manual, 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 the user will be required to correct the interference at his/her own expense.

> ⓘ NOTE: Any modifications made to this device that are not approved by Celestica may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 (Canada)

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

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

CE (European Community)

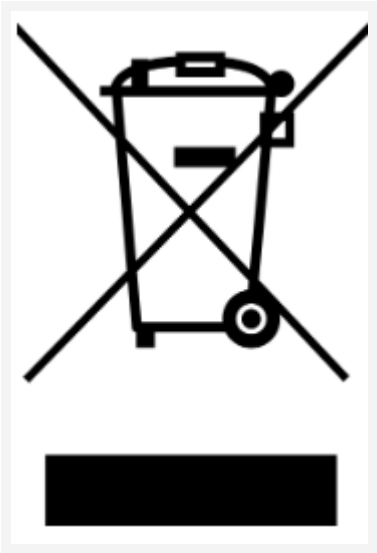
This product conforms to the following European Directive(s) and Standard(s): Application of Council Directive: 2014/35/EU, 2014/30/EU, 2011/65/EU.

Standards to which Conformity is declared: EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60950-1.

This is a Class A product.

In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Waste Electrical and Electronic Equipment (WEEE)



In accordance with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), the presence of the above symbol on the product or on its packaging indicates that this item must not be disposed of in the normal unsorted municipal waste stream. Instead, it is the user's responsibility to dispose of this product by returning it to a collection point designated for the recycling of electrical and electronic equipment waste. Separate collection of this waste helps to optimize the recovery and recycling of any reclaimable materials and also reduces the impact on human health and the environment.

For more information concerning the correct disposal of this product, please contact your local authority or the retailer where this product was purchased.

VCCI (Japan)

This is a 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 interference may occur, in which case, the user may be required to take corrective actions.

Chassis Installation

DS1000 is designed to be installed in a standard 19" square hole, four post rack. The bracket kit is only for 19 inch (483mm) wide, standard square hole racks, with a depth ranging from 22 inches ~ 33.5 inches (558mm ~ 850mm) as measured from rack post to rack post. This chapter covers the tools and procedures necessary to correctly and safely install the DS1000 Ethernet switch. Before beginning, create a clean, stable, and level work surface.

> ⓘ NOTE: The power distribution unit (PDU) location in the rack should avoid interference with the cable management accessory (CMA) and potential removal of field replaceable units (FRUs) from the rear of the chassis. A wider rack enclosure width is recommended along with suitable PDU and power cord plug orientation.

> ⚠ CAUTION: Use two or more people to mount chassis into rack.

Installation Tools

Gathering the following tools before starting the chassis installation is recommended.

- Phillips Head (PH#1 and PH#2) slotted screwdrivers
- Standard flat blade screwdriver
- Anti-static wrist strap
- Anti-static overalls
- Protective gloves

Rail Kit Assembly

There are several considerations to keep in mind when installing a rail kit in a server rack. Following these recommendations will ensure a successful installation.

> ### Elevated Operating Ambient Temperature
> If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room temperature. Therefore, consideration should be given to installing the equipment in an environment where the chassis does not exceed the maximum ambient temperature (Tma) specified.

Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Open Rack Mounting

Care should be taken to prevent the rack frame from obstructing the ventilation openings. Be sure to check the chassis positioning after installation to avoid overheating.

Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring.

Reliable Grounding

Reliable grounding (earthing) of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).

ⓘ NOTE: Rack mounted equipment must not be used as a shelf or work space. Do not add weight to rack mounted equipment.

For safety, a rack should should always be loaded from the bottom up. That is, install the equipment that will be mounted in the lowest part of the rack first, then the next higher systems, etc.

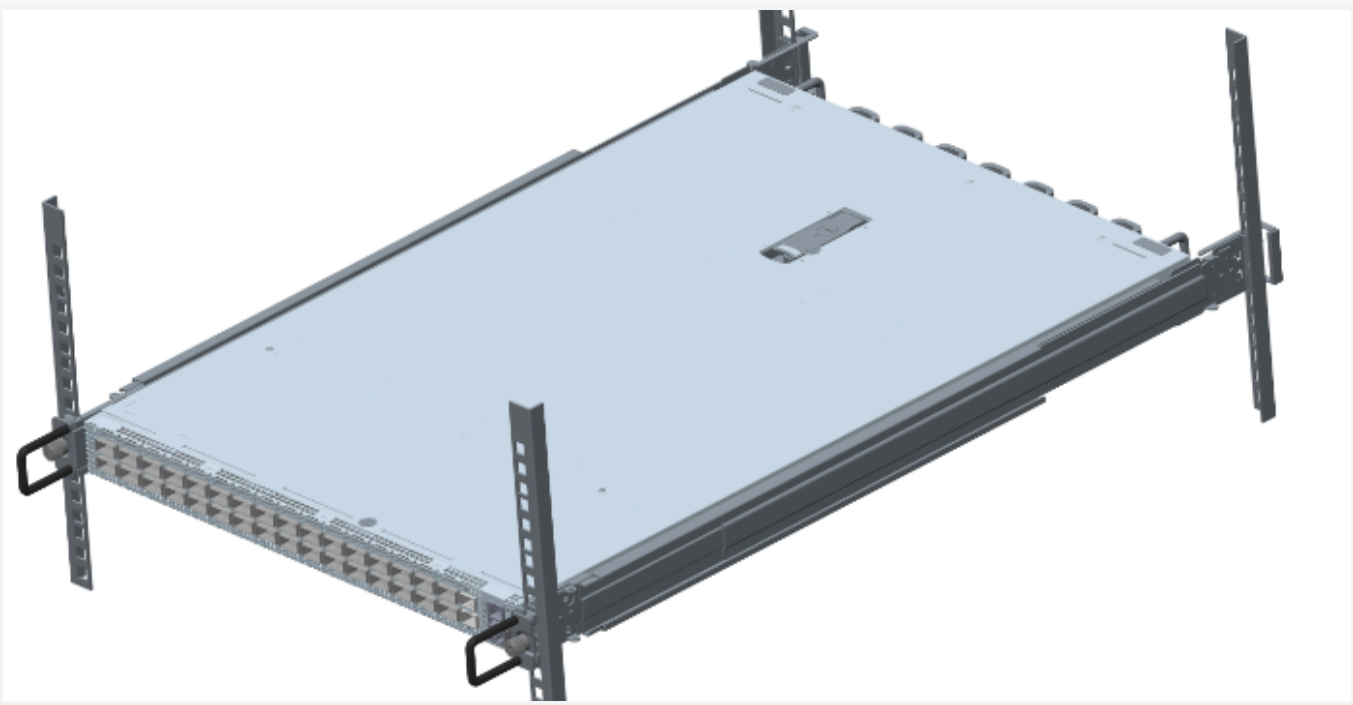
⚠ CAUTION: To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.

If a standard 19" rack is not available, DS1000 can be placed on a clean, stable, and level surface. Leave a clearance of 100mm (~4 inches) around the chassis for ventilation. Do not place anything on top of the chassis.

Installing the Chassis

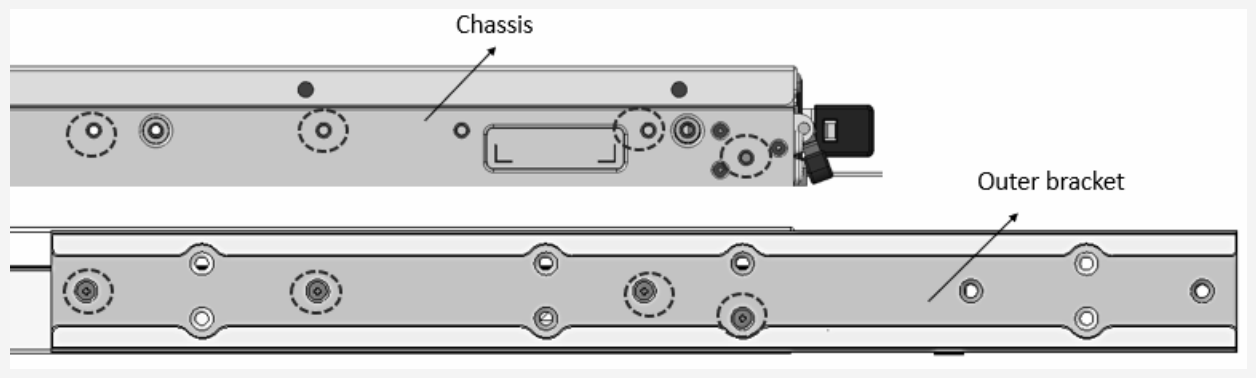
Context

> ⓘ NOTE: The following illustrations may display a different product. However, the installation process is similar to other Celestica rack-mountable networking products.



Procedure

1. Attach the two outer brackets with M4 screws provided in the accessory kit.
2. Align outer bracket with chassis holes (chassis left is same as right).



3. Lock outer bracket with M4 screw (PH#2 slotted screwdriver)

Figure 4. Secure Bracket to Chassis

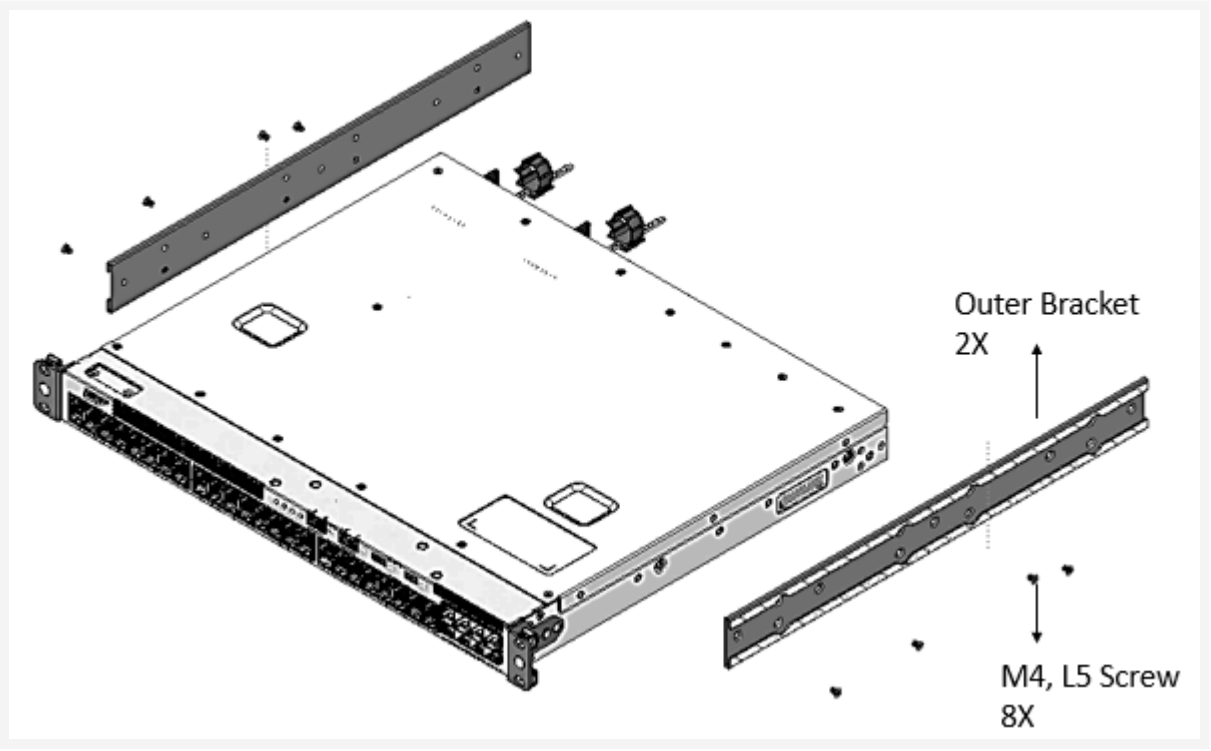
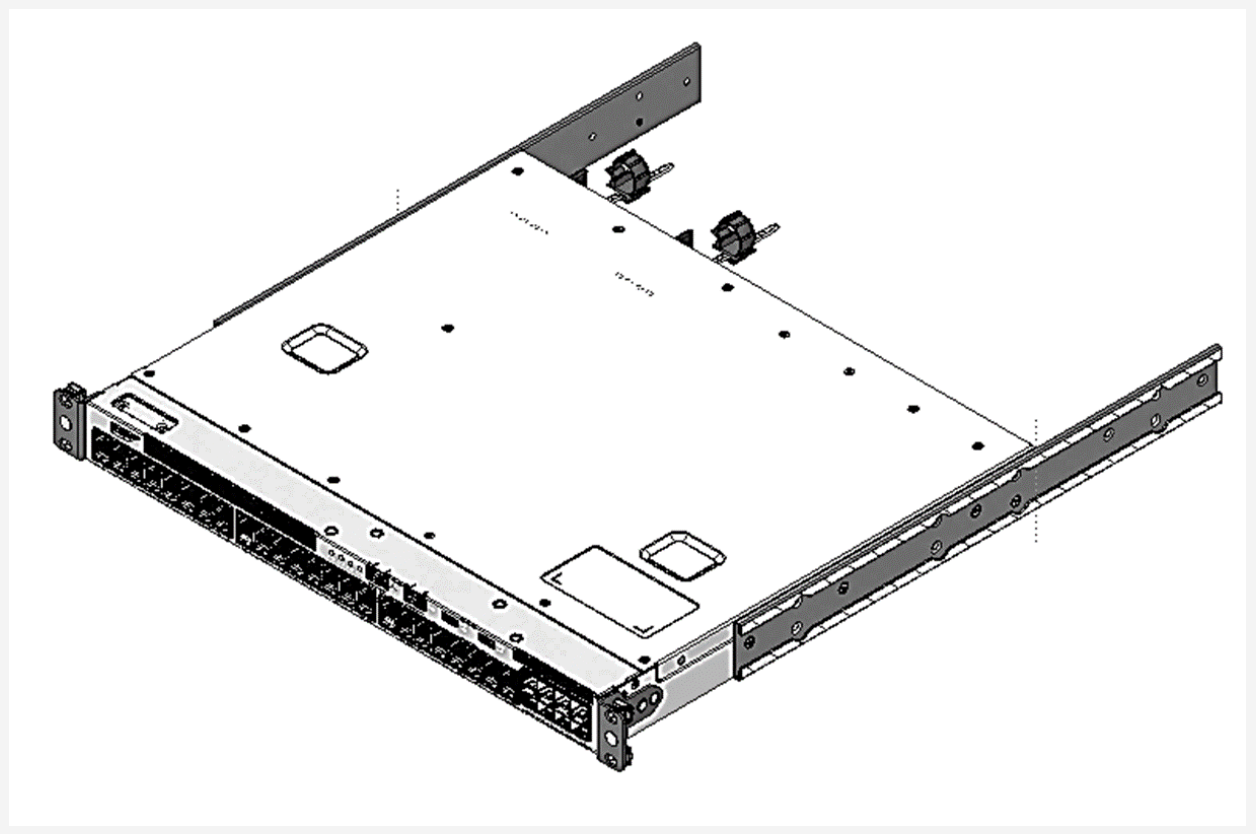


Figure 5. Inner Rail Bracket Installed to Chassis



4 Push the chassis with the outer bracket locked in step 1 above from the front side by one person, and push the inner bracket into the outer brackets (sleeve) slot on the chassis

from the rear side by another person at the same time, until guide pin (detail 1) and inner bracket guide pin (detail 3) fit in rack square holes. Then, lock them with M6 screws (PH#3 slotted screwdriver).

5. Press chassis and inner bracket until M6 screws fully lock.
6. Save enough space around the switch for good air circulation.

Contact Information

Celestica operates a customer service portal.

- Self-support resources (knowledge base, FAQ, common fixes, new firmware) are available.
- Our support teams are connected to the support portal and can receive notifications for requests.
- The portal also tracks and collects customer inputs for further improvements to our products and services.

Customers can register and request support (as well as search information in the knowledge base) at: https://customersupport.celestica.com/csm
In case there are any questions or issues using the customer portal visit: https://www.celestica.com/contact-us. For immediate questions, please feel free to call your responsible account manager.