
# DS4000 Installation Guide

# Table of Contents

# 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 |
| 1.2.0 | 3/2025 | Added Ground Lug Assembly (GLA) installation instructions |

# DS4000/DS4001 Installation Guide

This reference document provides important legal disclaimers and notices for the DS4000/DS4001 system.

## 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 document provides a detailed overview of the DS4000/DS4001 Ethernet switch's design features and offers guidance on its use.

## Intended Audiences

- System architects
- Firmware engineers
- System application engineers

## Document Conventions

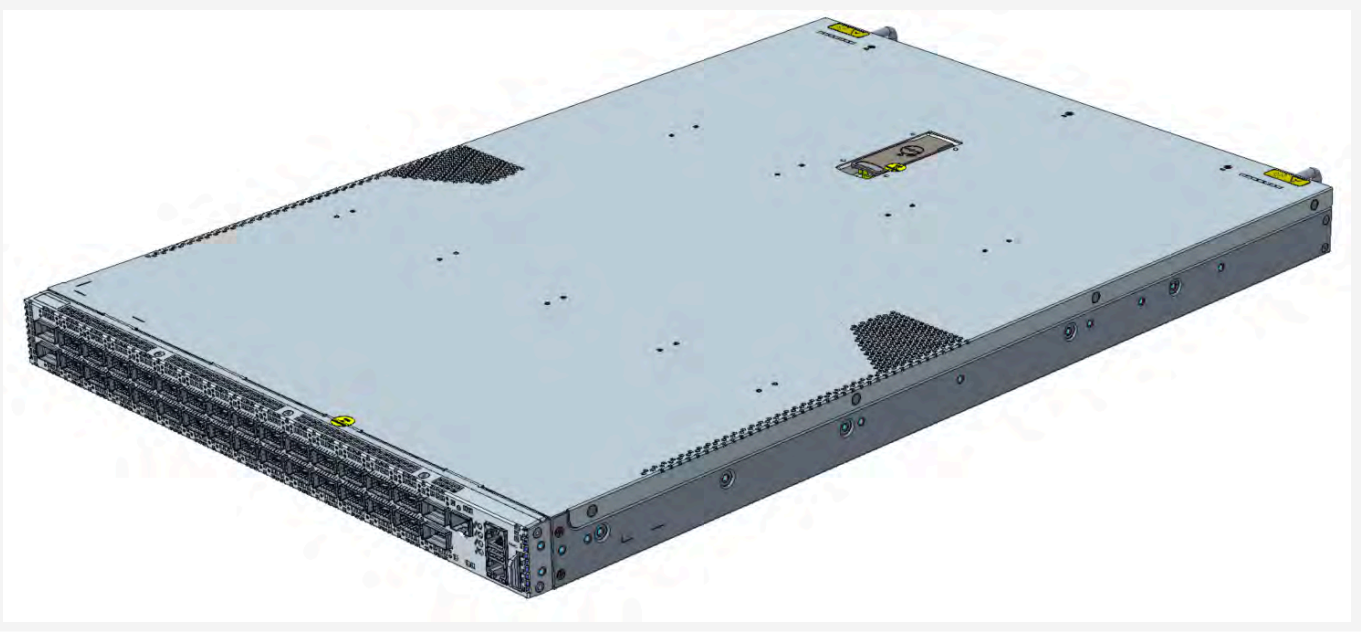
The following table describes various types of notes used within this installation guide.

| 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. |

# Product Overview

This document describes the general hardware design of the DS4000/DS4001 Ethernet switch.

The DS4000/DS4001 offers high-density and high-performance to meet new data center networking demands and data center challenges in the cloud era. The DS4000/DS4001 family is ideal for spine-and-leaf deployments in enterprise, service provider, and cloud provider environments.



## Optimized for:

- 400GbE Data Center Leaf / Spine
- Scalable Data Centers and Big Data Applications
- Cloud Computing
- Enterprise Aggregation / Core

## Product Specifications

| Type | DS4000/DS4001 |
|---|---|
| Depth | 657.5 mm |
| Height | 43.1 mm |
| Width | 438.5 mm |

| Type | DS4000/DS4001 |
| --- | --- |
| Weight | ??Kg |
| Power Input (VAC) | |
| Power Consumption (W) | |
| Operating Temperature (airflow front to back) | 5 - 40 ºC |
| Operating Temperature (airflow back to front) | 5 - 40 ºC |
| Operating Relative Humidity | 40 - 60 % |
| Storage Temperature | ?? ºC |
| Storage Relative Humidity | 5 - 95 % |

## Product Orientation

**Figure 1.** DS4000/DS4001 **(2x10GKR)**

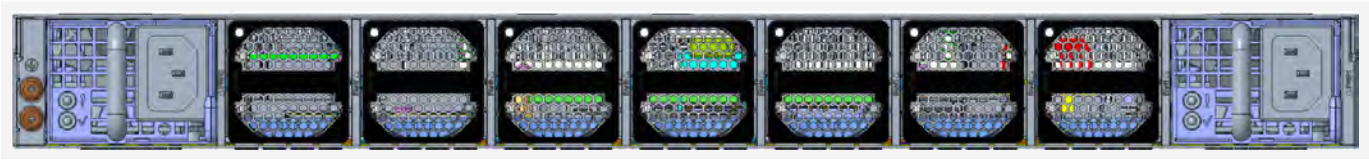
**Figure 2.** DS4000/DS4001 **(1xSFP+ and 1x10GKR)**

**Figure 3.** DS4000/DS4001 **(2xSFP+)**

ⓘ 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 4. Rear Panel View



# Status LEDs

The front panel of the DS4000/DS4001 has four status indication LEDs that are described in the following table.

Table 1.Front Panel Status LEDs

| Indicator LED | Front Panel Sign | LED State | Meaning |
|---|---|---|---|
| System | SYS | Green/Amber - Alternate blinking | Normal operation |
| | | Off | No power to system |
| Alarm | ALM | Green On | No alarm |
| | | Amber On | Critical alarm |
| | | Amber 1Hz blinking | Minor alarm |
| | | Amber 4Hz blinking | Major alarm |
| Power Supply Unit | PSU | Green On | All PSUs operating normally |
| | | Amber On | One or more PSUs absent or operating abnormally |
| | | Off | No power to system |
| Fan | FAN | Green On | All fans operating normally |
| | | Amber On | One or more fans absent or operating abnormally |
| | | Off | No power to |

| Indicator LED | Front Panel Sign | LED State | Meaning |
| --- | --- | --- | --- |
| | | | system |

The DS4000/DS4001 has additional status LEDs on the rear panel, which are described below.

Table 2.Rear Panel Status LEDs

| Indicator LED | Rear Panel Sign | LED State | Meaning |
| --- | --- | --- | --- |
| Fan module | FAN1 / FAN2 / FAN3 / FAN4 / FAN5 / FAN6 / FAN7 | Green | All fans operating normally |
| | | Amber | Fan(s) operating abnormally |
| | | Off | Fan absent |
| PSU module | P-1 / P-2 | Green | All PSUs operating normally |
| | | Red | PSU error(s) detected |
| | | Of | PSU off |

## Port Indicator LEDs

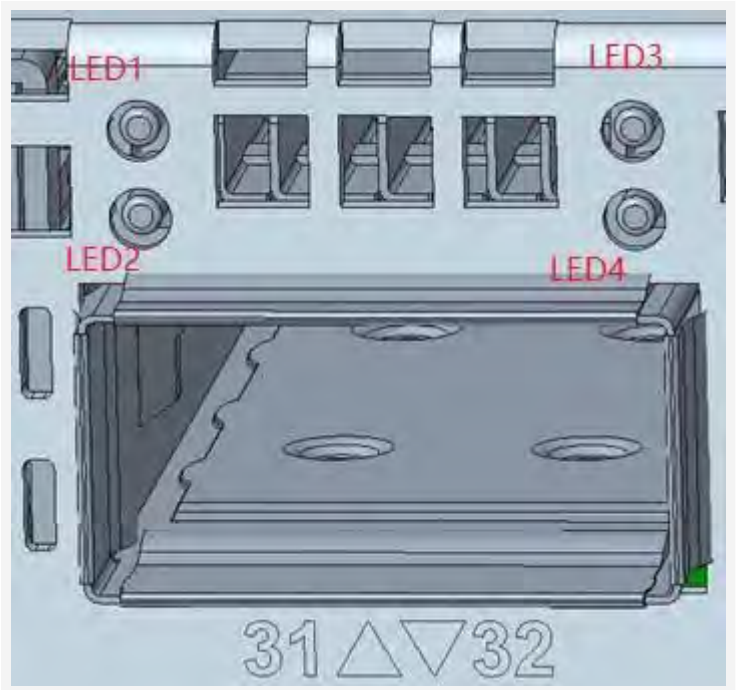
Table 3.Port Indicator Lights

| Indicator LED | LED State | Meaning |
| --- | --- | --- |
| Ethernet port active (left) | Green on | Port link active at 1000Mbps mode |
| | Amber on | Port link active in 10/ 100Mbps mode |
| | Off | Port link down |
| Ethernet port active (right) | Green blinking | Port link active with traffic |

| Indicator LED | LED State | Meaning |
|---|---|---|
| QSFP+ | Off | Port has no traffic |
| | Green on | Port link up at 10Gbps mode |
| | Green blinking | Port link activity at 10Gbps mode |
| | Amber on | Port link up at 1000Mbps mode |
| | Amber blinking | Port link active at 1000Mbps mode |
| | Off | Port link down |
| RJ45 | Green on | Port link active up 1000Mbps mode |
| | Green blinking | Port link active at 1000Mbps mode |
| | Amber on | Port link up at 10/100Mbps mode |
| | Amber blinking | Port link active in 10/ 100Mbps model |
| | Off | Port link down |

# QSFP-DD Port LED Locations

Each QSFP-DD port has four tri-color LEDs Blue/Green/Amber to enable a visual status indication for each link in a 4 breakout configuration.




After power on, all PORT LEDs will self-check (all colors blink in sequence), then turn off.

After SDK/NOS runs, each port's LEDs will function as listed in the following table:

Figure 5. Indicator LEDs of 32 QSFP-DD ports

| MODE / LED | 8X10G | 8X25G | 2X40G | 4X40G | 4X50G | 8X50G | 2X100G | 4X100G | 2X200G | 1X400G (1X200G) |
|---|---|---|---|---|---|---|---|---|---|---|
| LED1 | ■ / □ | ■ / □ | ■ | ■ | ■ | ■ / □ | ■ | ■ | ■ | ■ |
| LED2 | ■ / □ | ■ / □ | | ■ | ■ | ■ / □ | | ■ | | |
| LED3 | ■ / □ | ■ / □ | ■ | ■ | ■ | ■ / □ | ■ | ■ | ■ | |
| LED4 | ■ / □ | ■ / □ | | ■ | ■ | ■ / □ | | ■ | | |

# Port Descriptions

DS4000/DS4001 provides 32 x 400GbE QSFP-DD. Port types are described as follows:

| Port Mode | Spec |
|---|---|
| RJ-45 port | ▪ 10/100/1000Mbps auto negotiation<br>▪ MDI/MDI-X cable mode auto negotiation |
| SFP+ port | ▪ 10GbE |
| Serial Console port | ▪ supporting at a minimum 9600 and 115200 baud rates, eight data bits, one stop bit and no parity |
| USB port | ▪ USB2.0 host type A interface |
| QSFP-DD | ▪ 10BASECR/SR/LR/ER,25BASE-CR/SR/LR/ER, 40BASE-CR4/SR4/LR4/ER4,100BASECR4/SR4/LR4/ER4/DR1/PSM4/CWDM4<br>▪ 400BASE-CR4/SR4/FR4/DR4/LR8. |

# QSFP-DD Port Power Outputs

DS4000/DS4001 QSFP-DD ports support different power outputs:

**Front to Back (F2B)** 28x15W+4x20W (Port 1,2,31,32, marked **bold**)

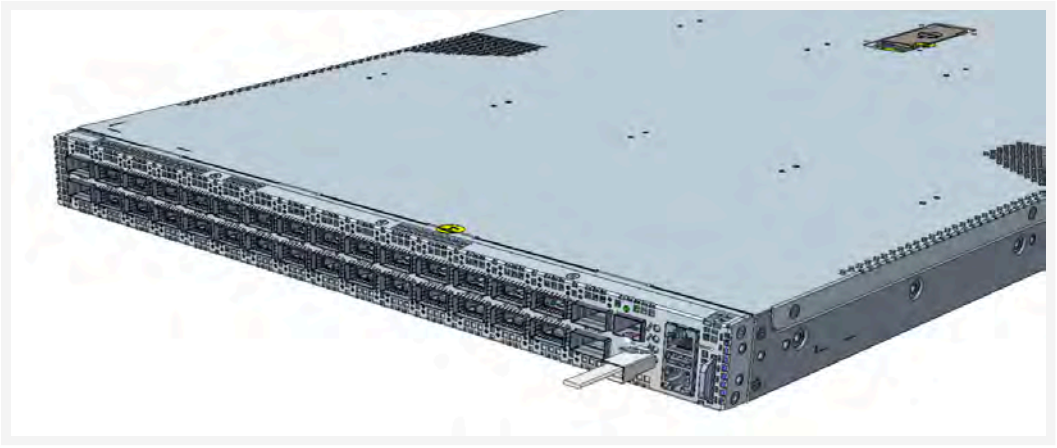
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | **31** |
| **2** | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | **32** |

**Back to Front (B2F)** 24x5W+8x12W (Port 25~32, marked **bold**)

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | **25** | **27** | **29** | **31** |
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | **26** | **28** | **30** | **32** |

# Connecting a Console

DS4000/DS4001 provides a serial console port.



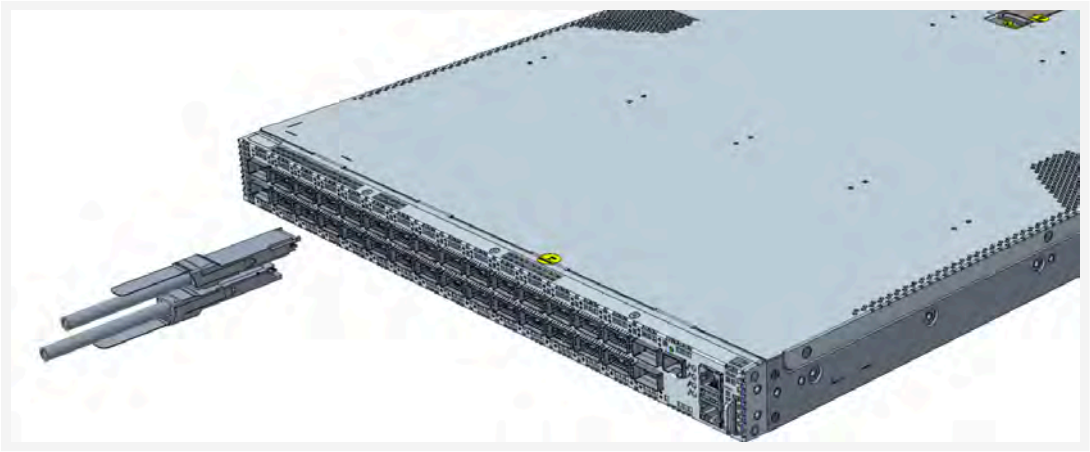
The connection procedure is listed below:

1. Find the console cable provided in the accessory kit. Attach the console cable end to console port of the switch.
2. Connect the other side of the console cable to a character terminal (PC).
3. Power on the switch and the character terminal. Configure the switch through the character terminal.

> ⓘ NOTE:
>
> Default serial terminal settings:
>
> - Baud rate:115200
> - Data bits: 8
> - Stop bits: 1
> - Parity: None
> - Flow control: XON/XOFF

# QSFP-DD-Transceiver Installation

DS4000/DS4001 provides 32 QSFP-DD ports.



The procedure for installing the QSFP-DD transceiver is shown below:

1. Step 1: Put on a ESD wrist strap (or antistatic gloves)
2. Step 2: Insert the QSFP-DD transceiver to the guide rail inside the QSFP-DD port. Do not put the QSFP-DD transceiver up-side-down.
3. Step 3: Push the QSFP-DD transceiver along the guide rail gently until you feel the transceiver snap into place at the bottom of the QSFP-DD port.

> ⓘ NOTE:

Note: the QSFP-DD transceiver is hot swappable.

Caution!

Do not stare directly at the 2 fiber bore in the QSFP transceiver when the switch is in operation, otherwise the laser may hurt your eyes.

Attention !

Ne regardez pas directement les 2 orifices de la fibre de l'émetteur-récepteur QSFP lorsque le commutateur est en fonctionnement, au risque de vous blesser les yeux avec le laser.

# DAC Cable Connection

1. Connect the DAC cable to QSFP-DD transceiver in the DS4000/DS4001 Ethernet switch.
2. With the system powered on, an illuminated link indicator light is means the component is working. If the light is not illuminated check the connection.

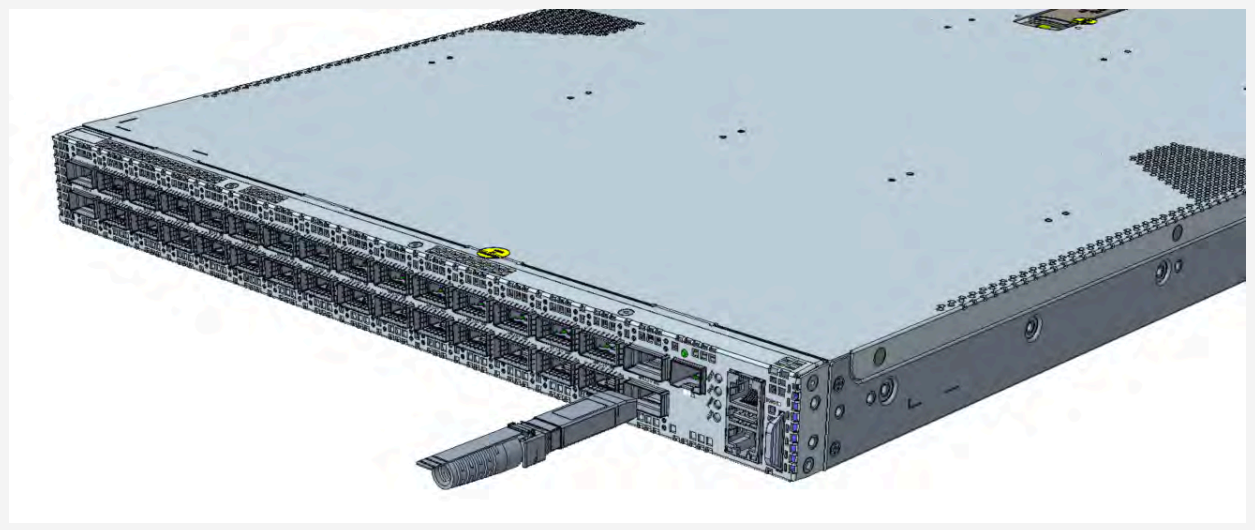
# SFP+ Transceiver Installation

## Context

DS4000/DS4001 offers configurations using 0/1/2 SFP+ ports.

## Procedure

1. Put on a ESD wrist strap (or antistatic gloves)



2. Insert the SFP+ transceiver to the guide rail inside the SFP+ port. Do not put the SFP+ transceiver up-side-down.
3. Push the SFP+ transceiver along the guide rail gently until you feel the transceiver snap into place at the bottom of the SFP+ port.

> ⚠ WARNING: Do not stare directly into cable (fiber bore) when system is powered on. Eye damage may occur.

# Copper Cable Connection

## Context

Connect the copper cables as shown below:

## Procedure

1. Insert one end of the Ethernet cable to the RJ-45 Ethernet port in the switch copper port.
2. Insert the other end of the Ethernet cable to the RJ-45 Ethernet port of other system.
3. Check all status indicators for the corresponding ports; a lighted LED indicates that the link is established, otherwise the link is not ready and the cable should be examined.

# Fiber Cable Connection

## Context

Fiber cables should be connected as below:

## Procedure

1. Remove the protective plug from the QSFP-DD fiber transceiver bore; Remove the protective cap from one end of the fiber cable. Keep the fiber end clean and neat.
2. Attach one end of the fiber cable to the QSFP-DD transceiver, and attach the other end to the transceiver of the corresponding devices.

   > ⚠ CAUTION: Please verify the symbol above the port prior to connecting. Connecting to a wrong port might damage the system.

3.

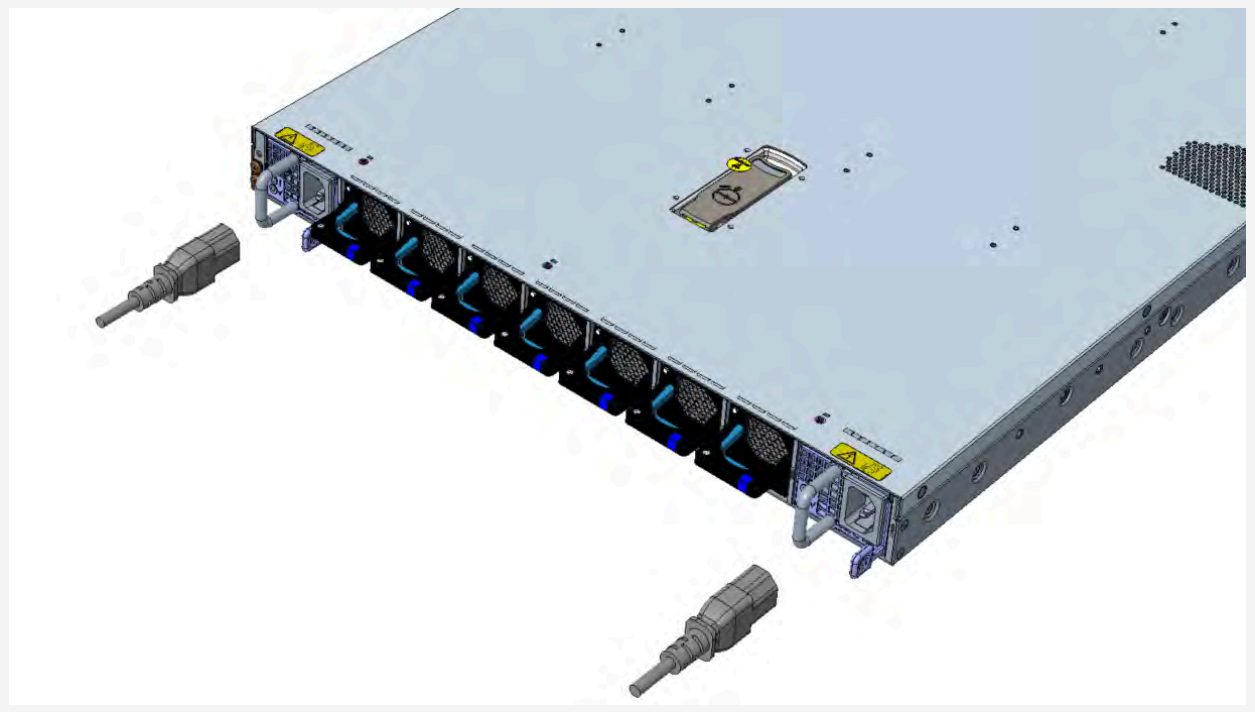
# AC Power Connection

## Context

DS4000/DS4001 uses 220VAC power supply by default. Please read the power input specifications for the detailed information.

## Procedure

1. Insert one end of the power cable provided in the accessory kit into power source socket, and the other end to the power socket (with overload and leakage protection).



2. Check the power status indicator on the front panel. The corresponding PWR indicator should light. DS4000/DS4001 is self-adjustable to the input voltage. As soon as the input voltage is in the range printed on the switch surface, the switch can operate correctly.
3. When the Ethernet switch is powered on, it executes the self-test procedure and starts.

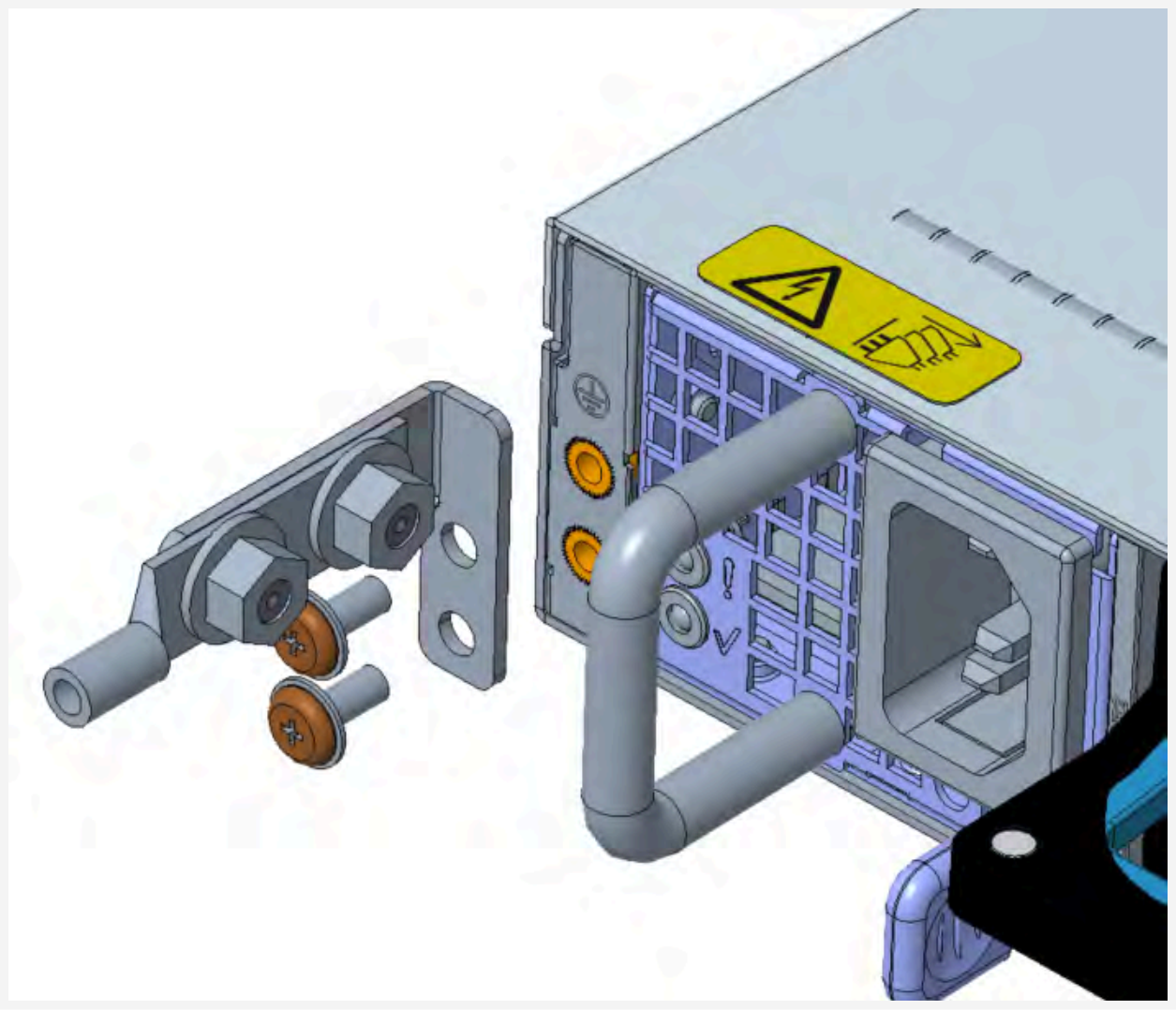
# Grounding

## Context

Proper grounding is essential to the safety and performance of the DS4000/DS4001.

## Procedure

1. Connect one end of the grounding cable to the grounding bracket on the back panel.
2. Attached grounding bracket to designated location on the chassis using the provided hardware.



3. Connect the other end of the cable to the rack's ground wire.

> ⚠ CAUTION: Proper grounding is essential to the safety and performance of this system. To avoid potential system or other damage, always ensure the chassis is properly grounded before connecting to power.

# Safety Precautions

Read this section before beginning any procedure. For your safety and the proper maintenance and operation of the DS4000/DS4001, 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 DS4000/DS4001 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

# Chassis Installation

DS4000/DS4001 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 DS4000/ DS4001 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.

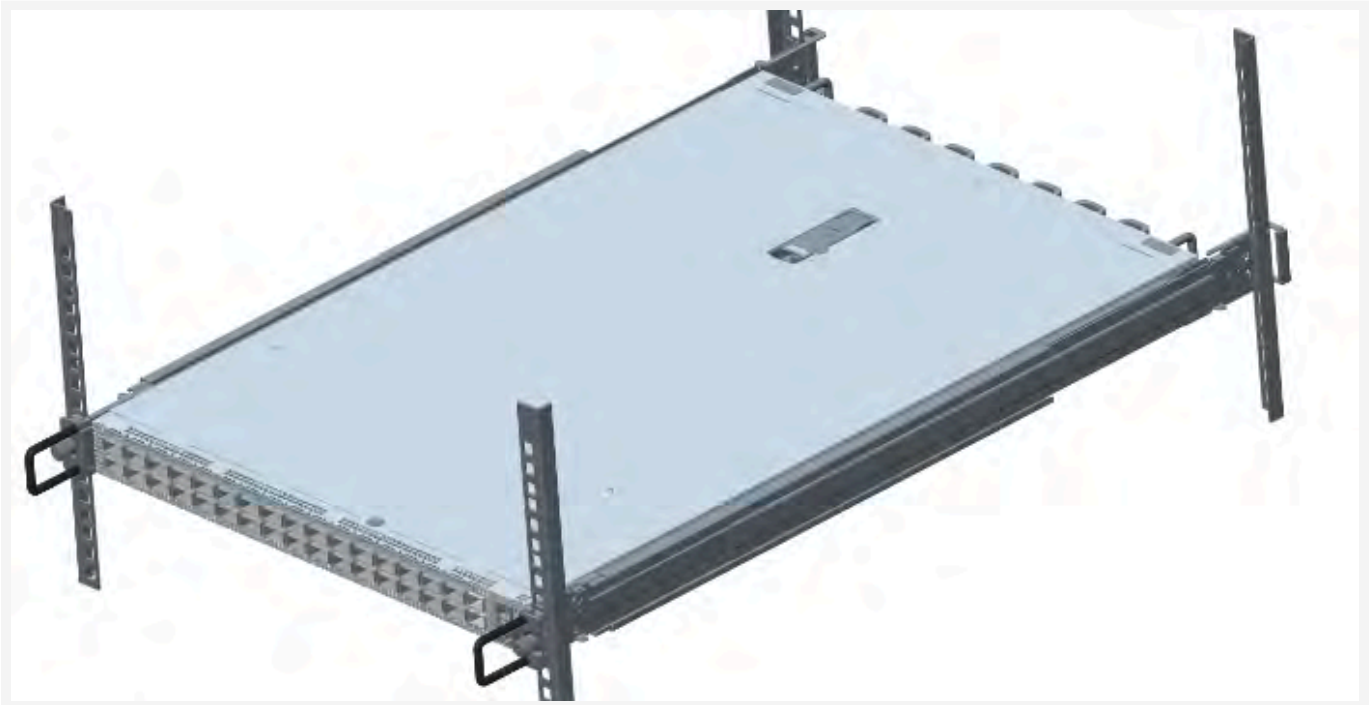
⚠ CAUTION: To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.

If a standard 19" rack is not available, DS4000/DS4001 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

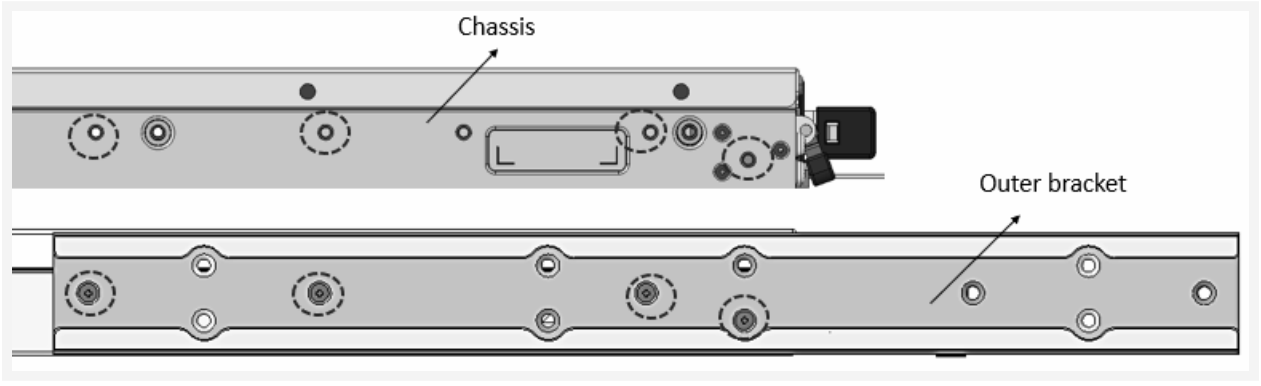
## Context

ⓘ 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 6. Secure Bracket to Chassis

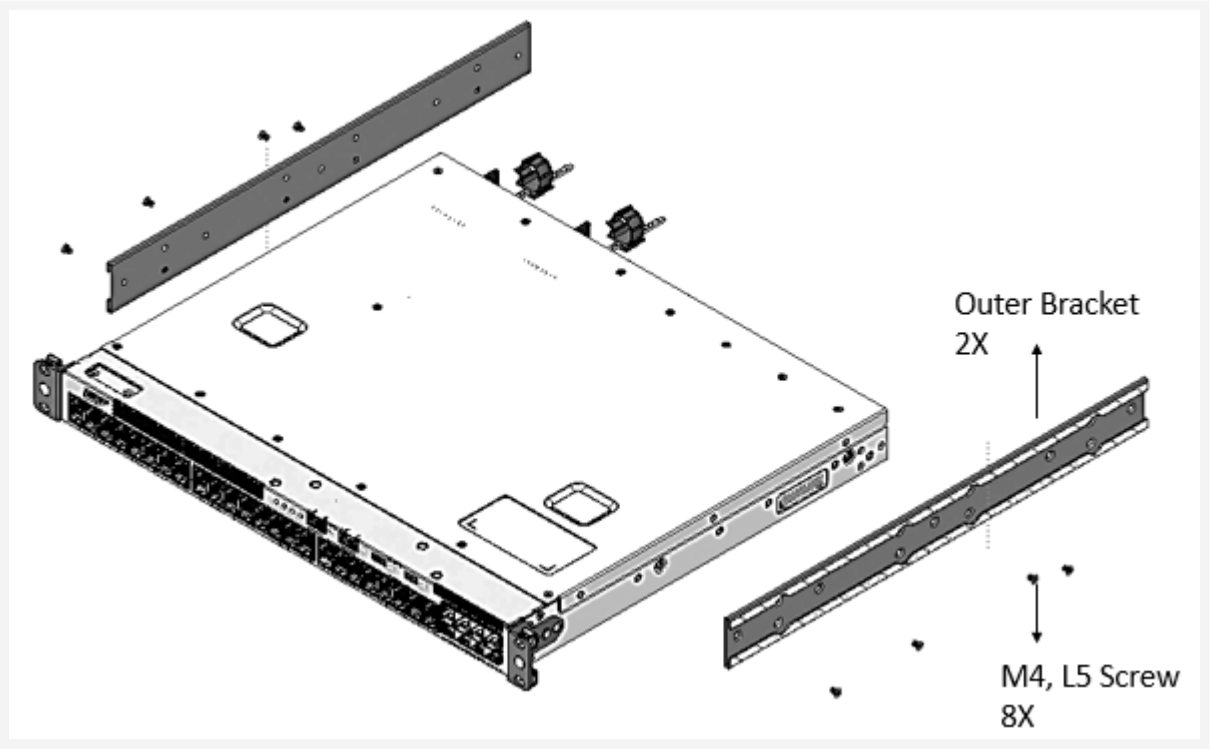
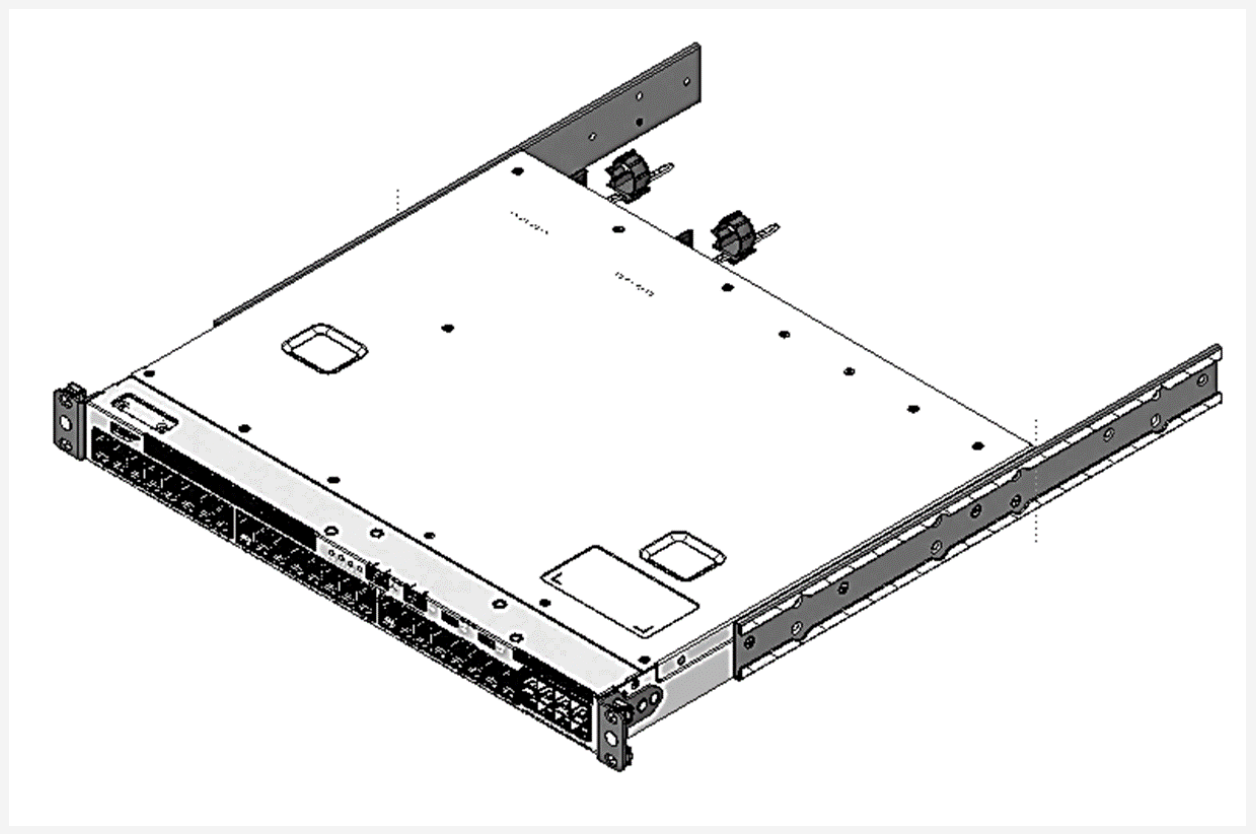



Figure 7. Inner Rail Bracket Installed to Chassis



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.

# Ground Lug Installation

## Context

The ground lug assembly (GLA) is used to safely and effectively ground the DS4000/DS4001's chassis to the rack in which it is installed. This is an important task in the overall installation process of the Ethernet switch.

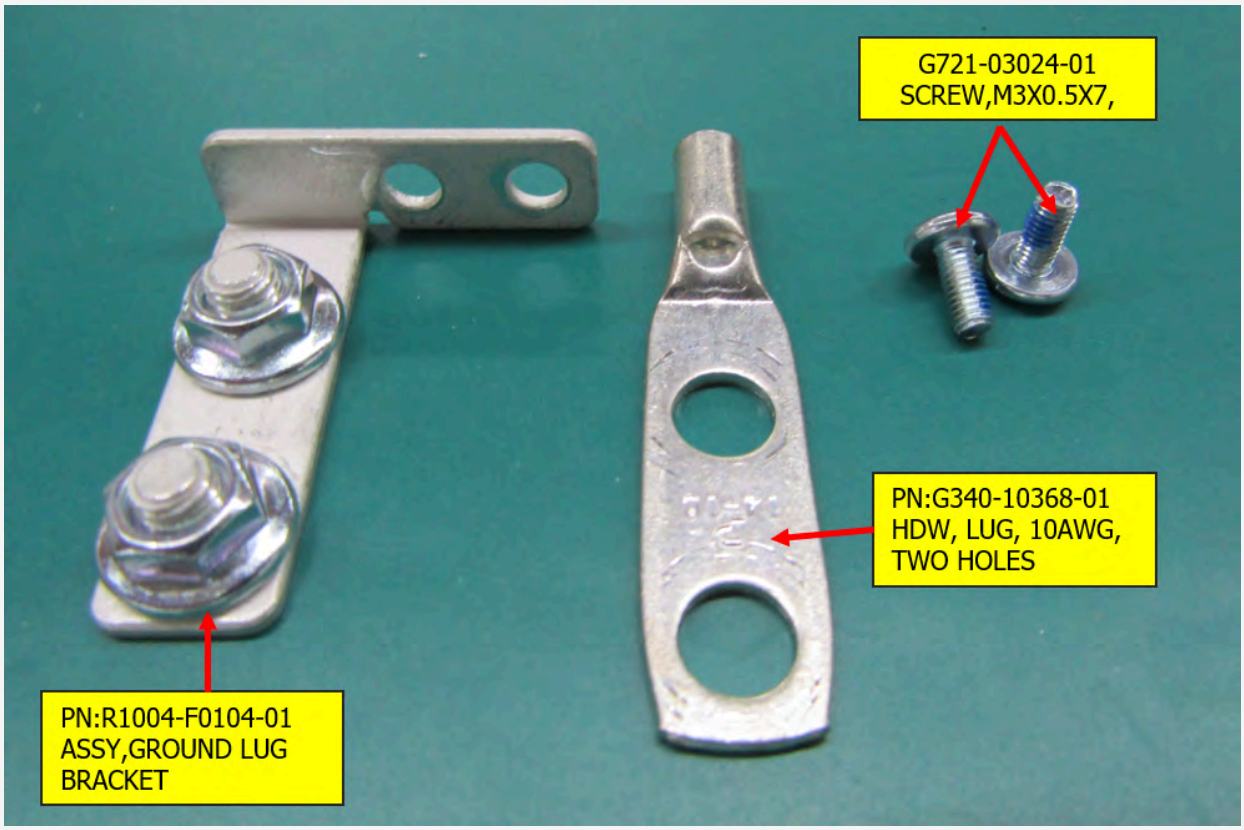
> ⓘ NOTE: The GLA is not applicable to the AC SKUs of the enclosure.

To install GLA, proceed with the following steps:

## Procedure

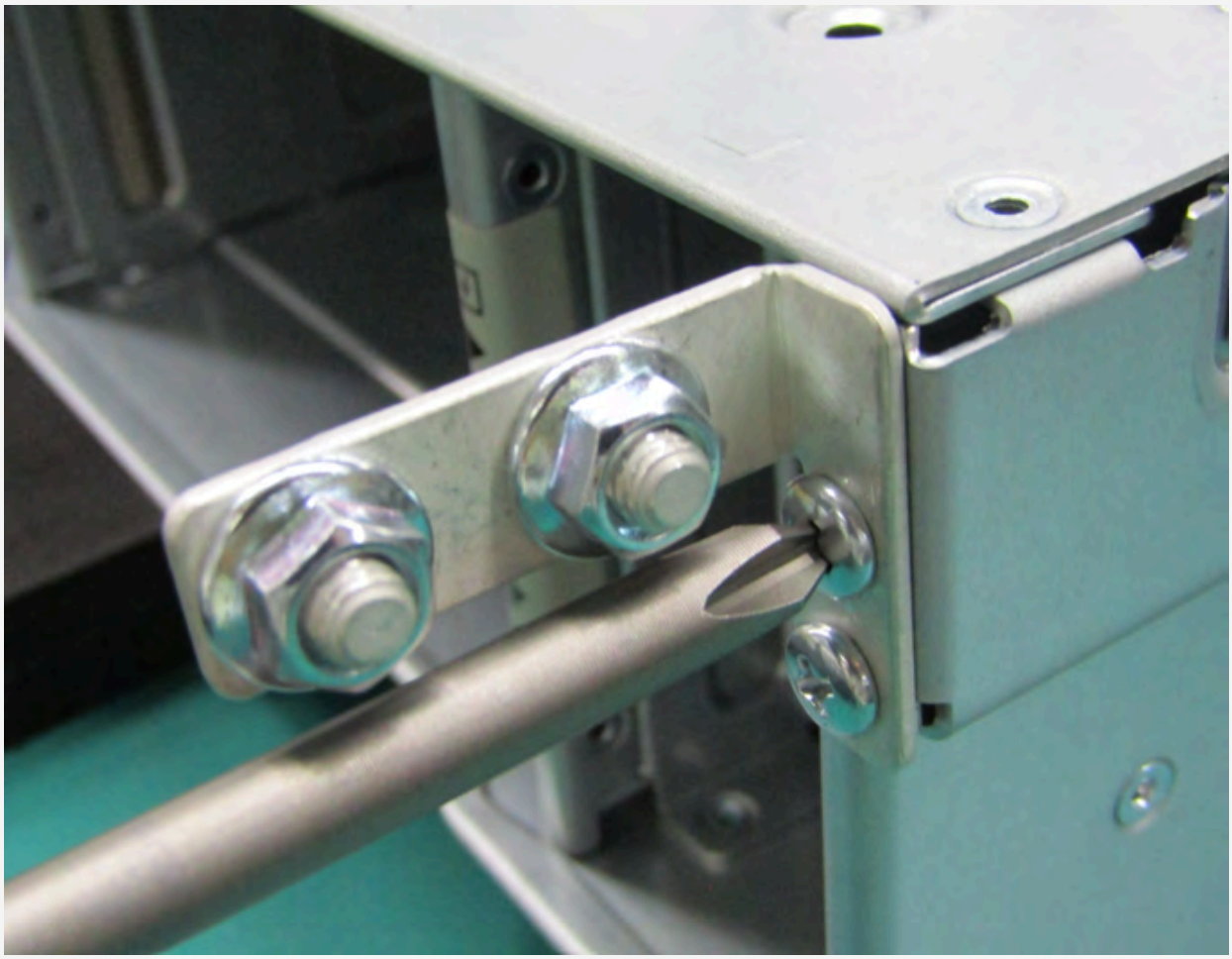
1. Gather a #2 Philips-head screwdriver, an eight millimeter hex socket, and an inch-pound torque wrench.


2 Verify the part numbers as listed within image.

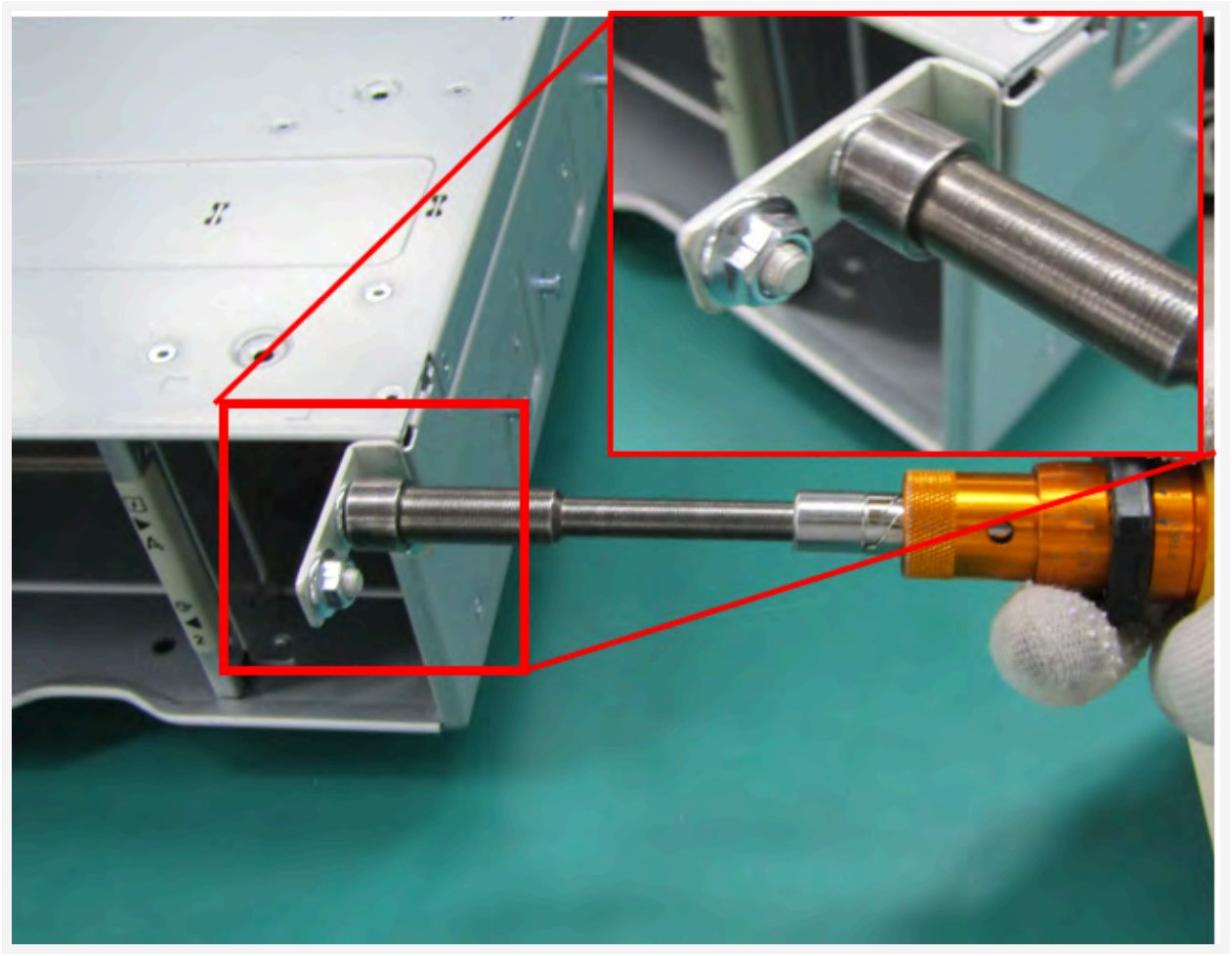



⚠ CAUTION: The image shows the ground lug assembly and the grounding wire terminal. The terminal must have a #10 AWG wire (not shown) crimped within it. The other end of the grounding wire must be securely attached to an unpainted metal surface on the rack. Failure to do so may result in system damage or failure and possible physical injury.

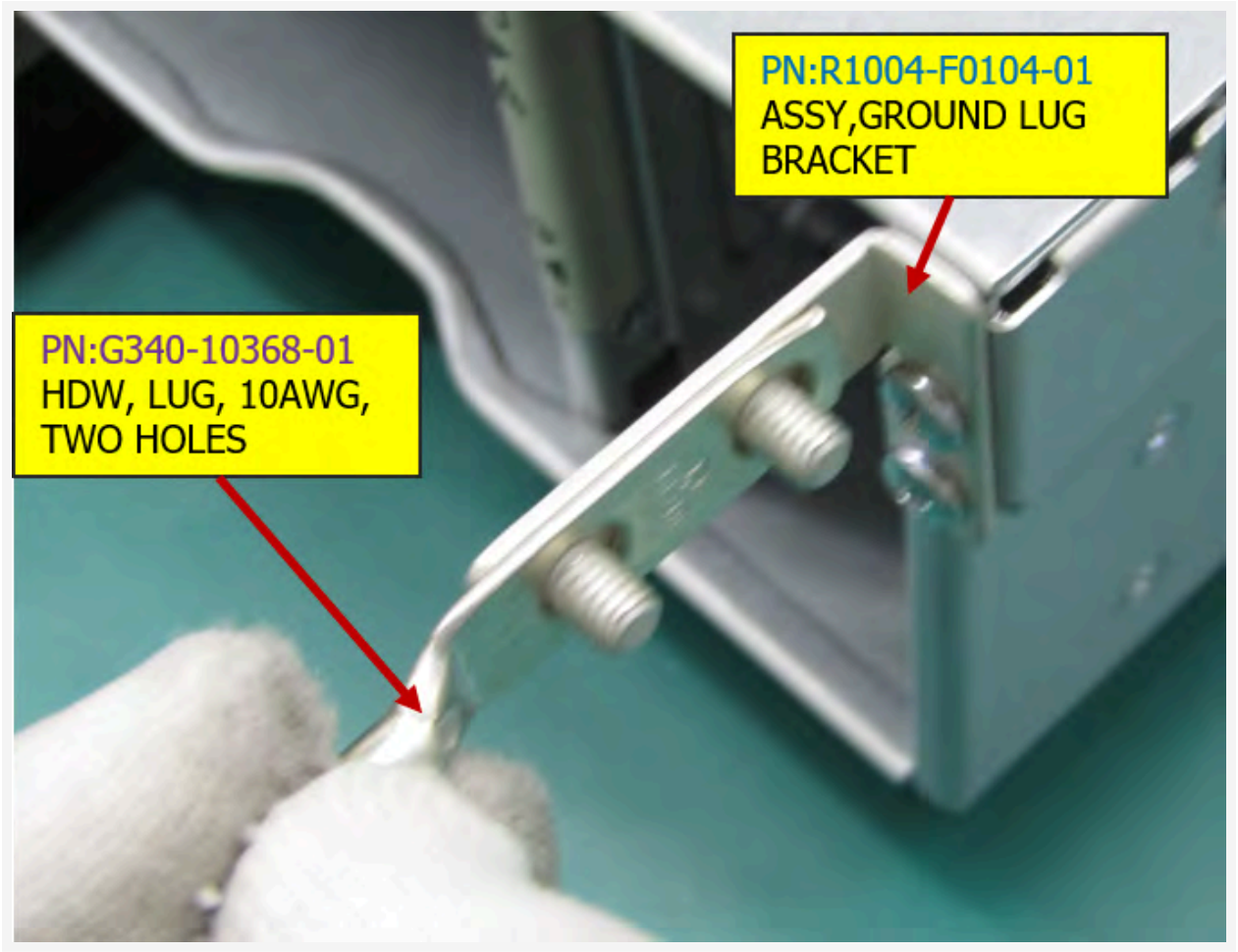
3 Tighten both screws to 4.5 inch/pounds (+/- 0.5 in/lb).



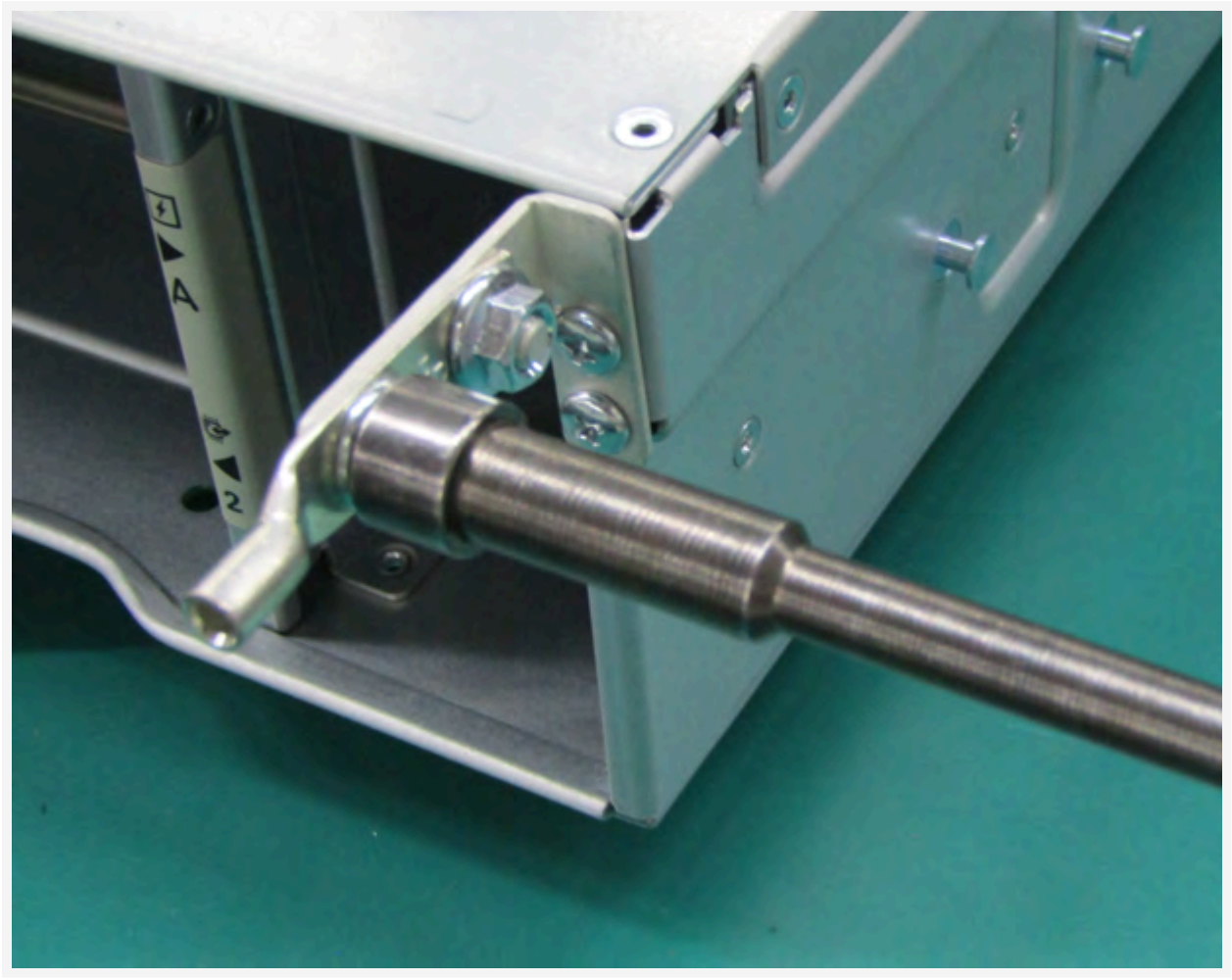
4 Remove both nuts and washers from grounding bracket.



5 Attach the grounding wire terminal and reinstall the washers and nuts.

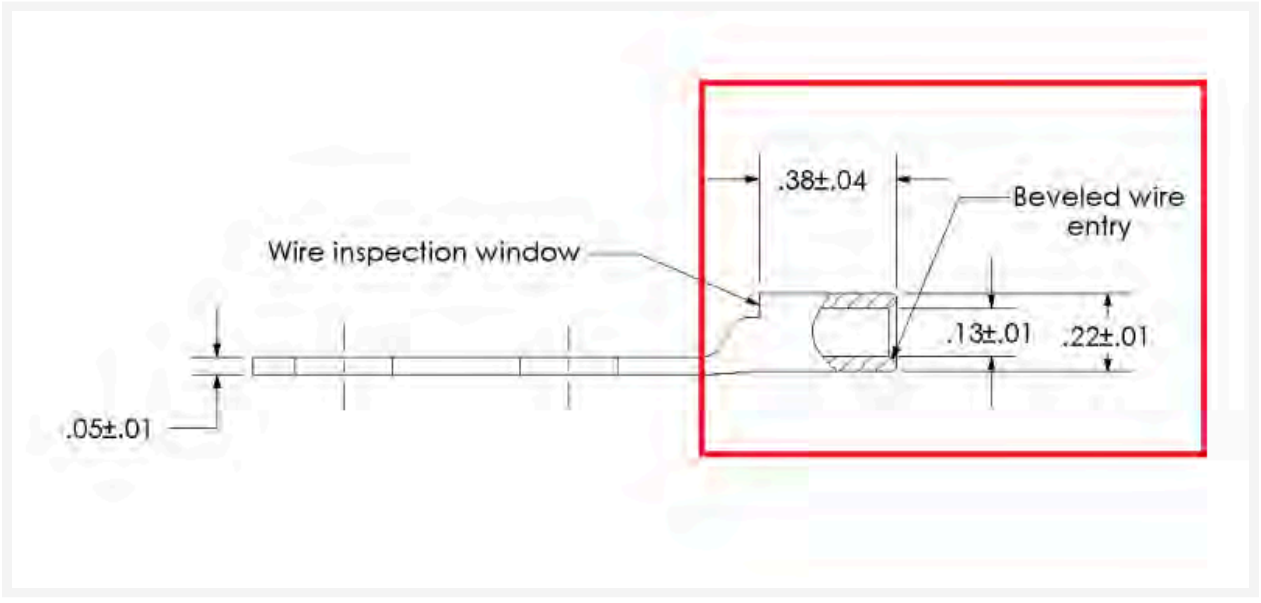



6 Tighten both nuts to 4.5 inch/pounds (+/- 0.5 in/lb).




7 The GLA installation process is complete.

8 When crimping the 10AWG cable to the lug, remove 0.38" of shielding to expose the metal wire. Slide it into the lug and ensure metal-to-metal contact before crimping.




⚠ CAUTION: The terminal must have a #10 AWG wire (not shown) crimped within it. The other end of the grounding wire must be securely attached to an unpainted metal surface on the rack. Failure to do so may result in system damage or failure and possible physical injury.

# 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)

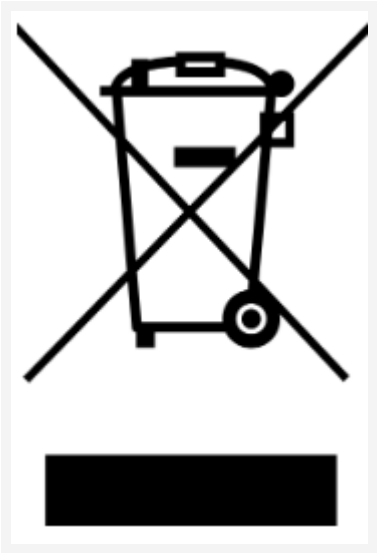
This product conforms to the following European Directive(s) and Standard(s): Application of Council Directive: 2014/35/EU, 2014/30/EU, 2011/65/EU.

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.

# 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.