NVIDIA Spectrum-2 SN3000 1U and 2U Switch Systems Hardware User Manual

NVIDIA Spectrum-2 SN3000 1U and 2U Switch Systems Hardware User Manual, SN3420, SN3700, SN3700C, SN3800

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This document is preliminary and subject to change.

Relevant for Models: SN3420, SN3700, SN3700C and SN3800

About this Manual

This manual describes the installation and basic use of NVIDIA Ethernet switches based on the NVIDIA Spectrum-2 ASIC.

Ordering Information

See Ordering Information.

Intended Audience

This manual is intended for IT managers and system administrators.

Related Documentation

Document	Description
NVIDIA Onyx (MLNX-OS) User Manual	This document contains information regarding the configuration and management of the NVIDIA Onyx® (MLNX-OS®) software. See https://www.nvidia.com/en-us/networking/ethernet-switching/onyx/.
Cumulus Linux User Guide	This document contains information regarding the configuration and management of the Cumulus® Linux® software. See https://docs.nvidia.com/networking-ethernet-software/cumulus-linux-51/.
Open Network Install Environment (ONIE) Quick Start Guide	See https://github.com/opencomputeproject/onie/wiki/Quick-Start-Guide/.
Hands-on workshops	Cumulus on-site/remote training: https://academy.nvidia.com/en/cumulus-linux-boot-camp/ NVIDIA Onyx on-site/remote training: https://academy.nvidia.com/en/course/onyx/?cm=242
On-site/remote services	For any tailor-made service, contact nbu-services-sales@nvidia.com.

Revision History

A list of the changes made to this document are provided in Document Revision History.

Ordering Information

This document is preliminary and subject to change.

The following table lists ordering information for the available systems.

Please pay attention to the airflow direction when ordering your system. For more details, see Air Flow.

SN3420 Ordering Part Numbers

System Model	Part Number	Legacy Part Number	Description
SN3420	920-9N213-00F7-0X0	MSN3420-CB2F	NVIDIA Spectrum-2 based 25GbE/100GbE 1U Open Ethernet switch with Onyx, 48 SFP28 ports and 12 QSFP28 ports, 2 power supplies (AC), x86 CPU, standard depth, P2C airflow, Rail Kit
	920-9N213-00R7-0X0	MSN3420-CB2R	NVIDIA Spectrum-2 based 25GbE/100GbE 1U Open Ethernet switch with Onyx, 48 SFP28 ports and 12 QSFP28 ports, 2 power supplies (AC), x86 CPU, C2P airflow, Short-depth, Rail Kit
	920-9N213-00F7-0C0	MSN3420-CB2FC	NVIDIA Spectrum-2 based 25GbE/100GbE 1U Open Ethernet switch with Cumulus Linux, 48 SFP28 ports and 12 QSFP28 ports, 2 power supplies (AC), x86 CPU, standard depth, P2C airflow, Rail Kit
	920-9N213-00R7-0C0	MSN3420-CB2RC	NVIDIA Spectrum-2 based 25GbE/100GbE 1U Open Ethernet switch with Cumulus Linux, 48 SFP28 ports and 12 QSFP28 ports, 2 power supplies (AC), x86 CPU, standard depth, C2P airflow, Rail Kit
	920-9N213-00F7-0N0	MSN3420-CB2FO	NVIDIA Spectrum-2 based 25GbE/100GbE 1U Open Ethernet switch with ONIE, 48 SFP28 ports and 12 QSFP28 ports, 2 power supplies (AC), x86 CPU, P2C airflow, Short-depth, Rail Kit
	920-9N213-00R7-0N0	MSN3420-CB2RO	NVIDIA Spectrum-2 based 25GbE/100GbE 1U Open Ethernet switch with ONIE, 48 SFP28 ports and 12 QSFP28 ports, 2 power supplies (AC), x86 CPU, C2P airflow, Short-depth, Rail Kit

SN3700/SN3700C Ordering Part Numbers

System Model	Part Number	Legacy Part Number	Description
SN3700C	920-9N201-00F7-0X0	MSN3700-CS2F	NVIDIA Spectrum®-2 based 100GbE 1U Open Ethernet Switch with NVIDIA Onyx, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit
	920-9N201-00R7-0X0	MSN3700-CS2R	NVIDIA Spectrum®-2 based 100GbE 1U Open Ethernet Switch with NVIDIA Onyx, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit

System Model	Part Number	Legacy Part Number	Description
	920-9N201-00F7-0C0	MSN3700-CS2FC	NVIDIA Spectrum®-2 based 100GbE 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit
	920-9N201-00R7-0C0	MSN3700-CS2RC	NVIDIA Spectrum®-2 based 100GbE 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit
	920-9N201-00F7-0N1	MSN3700-CS2FO	NVIDIA Spectrum®-2 based 100GbE 1U Open Switch with ONIE boot loader, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit
	920-9N201-00R7-0N0	MSN3700-CS2RO	NVIDIA Spectrum®-2 based 100GbE 1U Open Switch with ONIE boot loader, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit
SN3700	920-9N201-00FA-0X0	MSN3700-VS2F	NVIDIA Spectrum®-2 based 200GbE 1U Open Ethernet Switch with NVIDIA Onyx, 32 QSFP56 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit
	920-9N201-00RA-0X0	MSN3700-VS2R	NVIDIA Spectrum®-2 based 200GbE 1U Open Ethernet Switch with NVIDIA Onyx, 32 QSFP56 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit
	920-9N201-00FA-0C0	MSN3700-VS2FC	NVIDIA Spectrum®-2 based 200GbE 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP56 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit
	920-9N201-00RA-0C0	MSN3700-VS2RC	NVIDIA Spectrum®-2 based 200GbE 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP56 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit
	920-9N201-00FA-0N0	MSN3700-VS2FO	NVIDIA Spectrum®-2 based 200GbE 1U Open Ethernet Switch with ONIE boot loader, 32 QSFP56 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit
	920-9N201-00RA-0N0	MSN3700-VS2RO	NVIDIA Spectrum®-2 based 200GbE 1U Open Ethernet Switch with ONIE boot loader, 32 QSFP56 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit

SN3800 Part Numbers (EoL)

System Model	Part Number	Legacy Part Number	Description
SN3800	920-9N210-00F7-0X1	MSN3800-CS2F	NVIDIA Spectrum®-2 based 100GbE, 2U Open Ethernet Switch with NVIDIA Onyx, 64 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, P2C airflow, Rail Kit
	920-9N210-00R7-0X0	MSN3800-CS2R	NVIDIA Spectrum®-2 based 100GbE, 2U Open Ethernet Switch with NVIDIA Onyx, 64 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, C2P airflow, Rail Kit
	920-9N210-00F7-0C0	MSN3800-CS2FC	NVIDIA Spectrum®-2 based 100GbE, 2U Open Ethernet Switch with Cumulus Linux, 64 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, P2C airflow, Rail Kit
	920-9N210-00R7-0C0	MSN3800-CS2RC	NVIDIA Spectrum®-2 based 100GbE, 2U Open Ethernet Switch with Cumulus Linux, 64 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, C2P airflow, Rail Kit
	920-9N210-00F7-0N0	MSN3800-CS2FO	NVIDIA Spectrum®-2 based 100GbE 2U Open Ethernet switch with ONIE, 64 QSFP28 ports, 2 power supplies (AC), x86 CPU, Standard depth, P2C airflow, Rail Kit
	920-9N210-00R7-0N0	MSN3800-CS2RO	NVIDIA Spectrum®-2 based 100GbE 2U Open Ethernet switch with ONIE, 64 QSFP28 ports, 2 power supplies (AC), x86 CPU, Standard depth, C2P airflow, Rail Kit

Introduction

This document is preliminary and subject to change.

NVIDIA SN3000 series switches are the third generation of NVIDIA Spectrum purpose-built switches for leaf/spine and super-spine datacenter applications. Allowing maximum flexibility, SN3000 series provides port speeds spanning from 1GbE to 200GbE, and a port density that enables full rack connectivity to any server at any speed. In addition, the uplink ports allow a variety of blocking ratios to suit any application requirement. This series is ideal for building wire-speed and cloud-scale layer-2 and layer-3 networks. SN3000 platforms deliver high performance, consistent low latency along with support for advanced software defined networking features, making it the ideal choice for web scale IT, cloud, hyperconverged storage and data analytics applications.

Open Ethernet breaks the paradigm of traditional switch systems, eliminating vendor lock-in. Instead of forcing network operators to use the specific software that is provided by the switch vendor, Open Ethernet offers the flexibility to use a choice of operating systems on top of Ethernet switches, thereby re-gaining control of the network, and optimizing utilization, efficiency and overall return on investment. Open Ethernet adopts the same principles as standard open solutions for servers and storage, and applies them to the world of networking infrastructure. It encourages an ecosystem of open source, standard network solutions. These solutions can then be easily deployed into the modern data center across network equipment that eases management and ensures full interoperability. With a range of system form factors, and a rich software ecosystem, the SN3000 series allows you to pick and choose the right components for your data center.

NVIDIA SN3000 series platforms are based on the high-performance 50G PAM4 capable NVIDIA Spectrum-2 ASIC. SN3000 platforms are available in a range of configurations, each delivering high performance combined with feature-rich layer 2 and layer 3 forwarding, ideally suited for both top-of-rack leaf and fixed configuration spines. The NVIDIA SN3000 series provides full wire speed, cut through-mode latency, on-chip fully-shared 42MB packet buffering, and flexible port use in addition to advanced capabilities. Combining a wide range of innovations in the area of programmability, telemetry, and tunneling with industry leading performance, NVIDIA SN3000 series is capable of addressing today’s data center’s complex networking requirements, growth and expansion.

As data-center switching architectures increasingly adopt 100GbE, the SN3420 system offers a high performance, cost-effective way to evolve host connectivity from 10G to 25G. Equipped with 48 ports of 10/25GbE and 12 ports of up to 100GbE in a compact 1U form factor, the SN3420 is an ideal Top-of-Rack (ToR) switch platform, delivering a total throughput of up to 4.8Tb/s with a processing capacity of 3.58Bpps. The SN3420 enables the seamless use of QSFP28 connections for leaf-spine topology and future-proofing the data center.NVIDIA SN3700 200GbE spine/super-spine offers 32 ports of 200GbE in a compact 1U form factor. It enables connectivity to endpoints at different speeds and carries a throughput of 6.4Tb/ s, with a landmark 8.33Bpps processing capacity. SN3700C allows for maximum flexibility, with ports spanning from 1GbE to 100GbE and port density that enables full rack connectivity to any server at any speed. SN3700C ports are fully splittable to up to 128 x 10/25GbE ports.

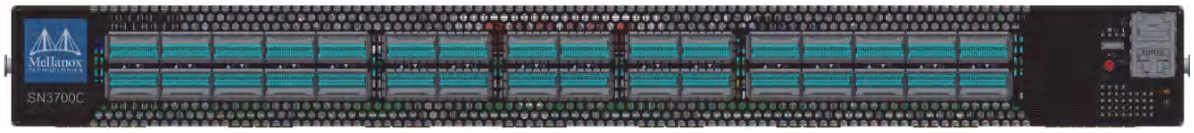
NVIDIA SN3800 is a 64-port 100GbE switch system that is ideal for spine/super-spine applications. With a landmark 8.33Bpps processing capacity and 6.4Tb/s throughput in a dense 2U form factor, SN3800 offers diverse connectivity in combinations of 10/25/40/50/100GbE. The SN3800 is well-suited to answer the challenging needs of large virtualized data centers and cloud environments.

For a full list of all available ordering options, see Ordering Information.

SN3420 Front View

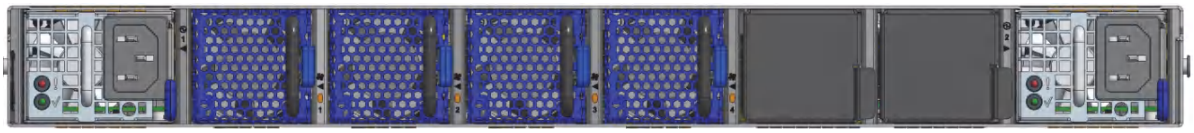
SN3420 Rear View

SN3700/SN3700C Front View

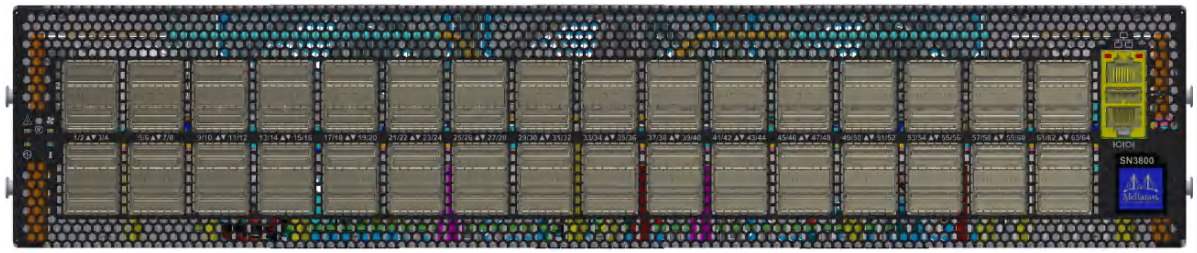


SN3700 Rear View

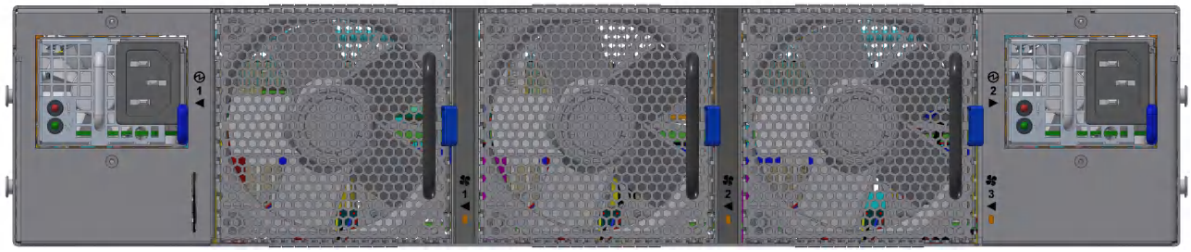
SN3700C Rear View



SN3800 Front View



SN3800 Rear View



Speed and Switching Capabilities

The table below describes maximum throughput and interface speed per system model.

System Model	Interfaces	Supported Rates	Max Throughput
SN3700C	32 x QSFP28	32 x 100GbE/40GbE 64 x 50GbE 128 x 1/10/25GbE	3.2Tb/s
SN3700	32 x QSFP56	32 x 200GbE/40GbE 64 x 100GbE 128 x 1/10/25/50GbE	6.4Tb/s
SN3800	64 x QSF28	64 x 100GbE/40GbE (for 40GbE contact NVIDIA sales) 128 x 10/25/50GbE	6.4Tb/s
SN3420	48 x SFP28 + 12 x QSFP28	48 x 10/25GbE 12 x 100GbE	4.8Tb/s

*The system can support different interfaces and speed rates using QSFP to SFP adapters or hybrid cables. For further information, see Splitter (Breakout) Cables and Adapters.

Management Interfaces, PSUs and Fans

The table below lists the various management interfaces, PSUs and fans per system model.

System Model	uUSB	MGT (Management)	Console	PSU	Fan
SN3700C	Front	Front	Front	2 units	4 units

System Model	uUSB	MGT (Management)	Console	PSU	Fan
SN3700	Front	Front	Front	2 units	6 units
SN3800	Front	Front	Front	2 units	3 units
SN3420	Front	Front	Front	2 units	5 units

Features

For a full feature list, please refer to the system's product brief. Go to http://www.mellanox.com. In the main menu, click on Products > Ethernet Switch Systems, and select the desired product family.

Certifications

The list of certifications (such as EMC, Safety and others) per system for different regions of the world is located on the NVIDIA website at http://www.mellanox.com/page/environmental_compliance.

Installation

System Installation and Initialization

Installation and initialization of the system require attention to the normal mechanical, power, and thermal precautions for rack-mounted equipment.

> ⚠ The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Take precautions to guarantee proper ventilation in order to maintain good airflow at ambient temperature.

> ⚠ Unless otherwise specified, NVIDIA products are designed to work in an environmentally controlled data center with low levels of gaseous and dust (particulate) contamination.
>
> The operation environment should meet severity level G1 as per ISA 71.04 for gaseous contamination and ISO 14644-1 class 8 for cleanliness level.

The installation procedure for the system involves the following phases:

Step	Procedure	See
1	Follow the safety warnings	Safety Warnings
2	Install a 100A DC disconnect switch	100A DC Disconnect Switch Requirement
3	Pay attention to the air flow consideration within the system and rack	Air Flow
4	Make sure that none of the package contents is missing or damaged	Package Contents
5	Mount the system into a rack enclosure	19" System Mounting Options
6	Power on the system	Initial Power On
7	Perform system bring-up	System Bring-Up
8	[Optional] FRU replacements	FRU Replacements

Safety Warnings

Prior to the installation, please review the Safety Warnings. Note that some warnings may not apply to all models.

100A DC Disconnect Switch Requirement

Before installing the switch system, make sure a DC disconnect switch is available and can be connected to the switch externally via an over-current DC circuit breaker of up to 100A.

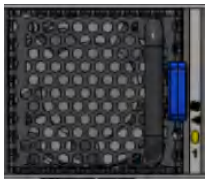
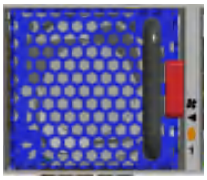
The optimal operating voltage range of the switch system is between 48VDC to 60VDC.

> ⚠ The DC disconnect switch must be provided by the customer.

Air Flow

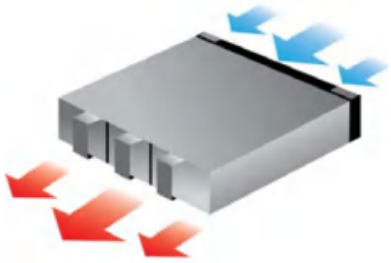
NVIDIA systems are offered with two air flow patterns:

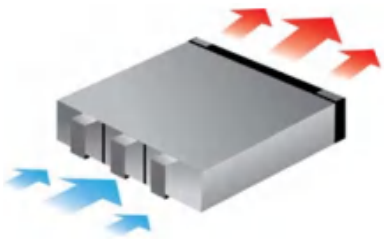
> ⚠ the images are provided for illustration purposes only. The design may slightly vary in different systems

• Power (rear) side inlet to connector side outlet - marked with blue power supplies/ fans FRUs' handles. 	• Connector (front) side inlet to power side outlet - marked with red power supplies/fans FRUs' handles. 

> ⚠ All servers and systems in the same rack should be planned with the same airflow direction.
>
> All FRU components need to have the same air flow direction. A mismatch in the air flow will affect the heat dissipation.

The table below provides an air flow color legend and respective OPN designation.

Direction	Description and OPN Designation
	Connector side inlet to power side outlet. Red latches are placed on the power inlet side. OPN designation is "-R".

Direction	Description and OPN Designation
	Power side inlet to connector side outlet. Blue latches are placed on the power inlet side. OPN designation is “-F”.

Package Contents

Before installing your new system, unpack it and check against the parts list below that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping.

The package content is as follows:

- 1 - System
- 1 - Rail kit
- 1 - Power cable for each power supply unit - Type C13-C14
- 1 - Harness: HAR000028 - Harness RS232 2M cable - DB9 to RJ-45
- 1 - Cable retainer for each power supply unit

If anything is damaged or missing, contact your sales representative at Networking-support@nvidia.com.

Mounting Options

By default, the systems are sold with fixed rail-kits. Telescopic Rail-kits are available for some systems, and should be purchased separately. For installation instructions, refer to the relevant links in the following table:

System Model	Fixed Rail-kit (Default)	Telescopic Rail-kit
SN3700/SN3700C	SN3700/SN3700C Fixed Rail Kit	SN3700/SN3700C Telescopic Rail Kit
SN3800	SN3800 Fixed Rail Kit	SN3800 Telescopic Rail Kit
SN3420	SN3420 Fixed Rail Kit	N/A

SN3700/SN3700C Fixed Rail Kit

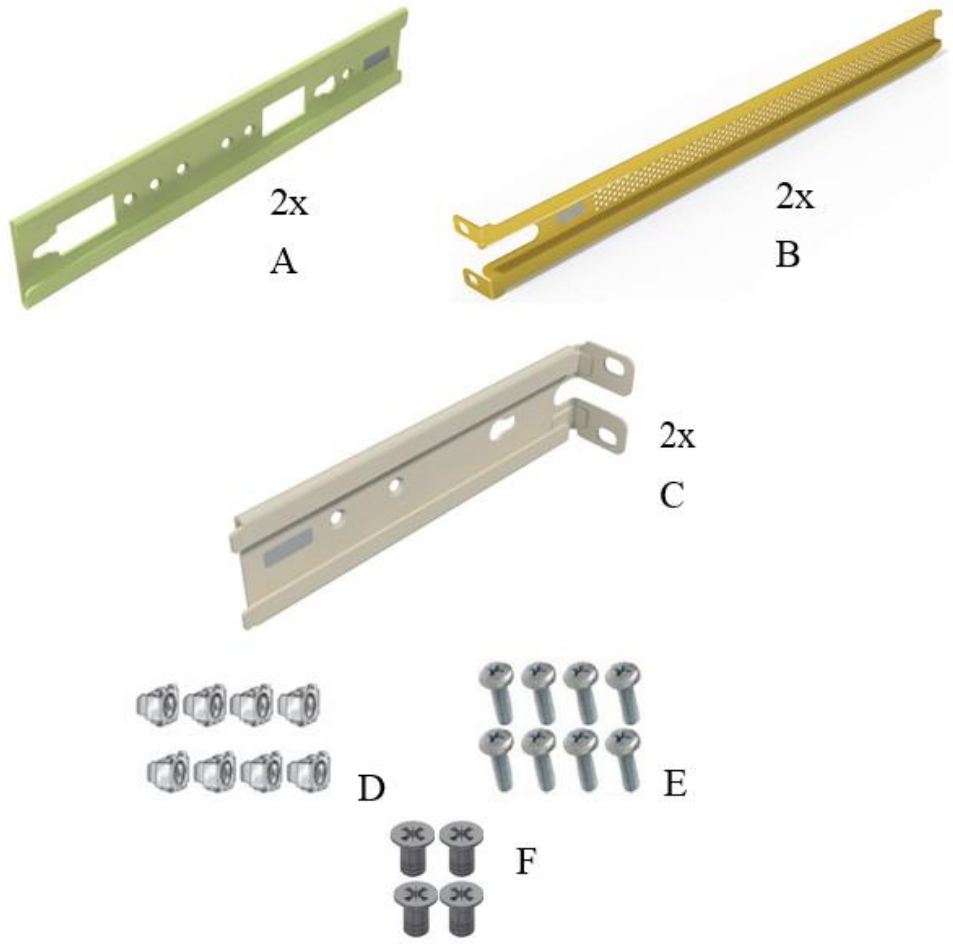
This document is preliminary and subject to change.

Kit Part Number	Legacy Part Number	Rack Size and Rack Depth Range
930-9NRKT-00JN-000	MTEF-KIT-J	600-800 mm

The following parts are included in the fixed rail kit (see figure below):

- 2x Rack mount rails (A)
- 2x Rack mount blades (B)
- 2x Rack mount ears (C)
- 8x M6 Standard cage nuts (D)
- 8x M6 Standard pan-head Phillips screws (E)
- 4x Flat Head Phillips 100 DEG 6-32X1/4" ST.ST PATCH 360 (F)

Rack Rail Kit Parts



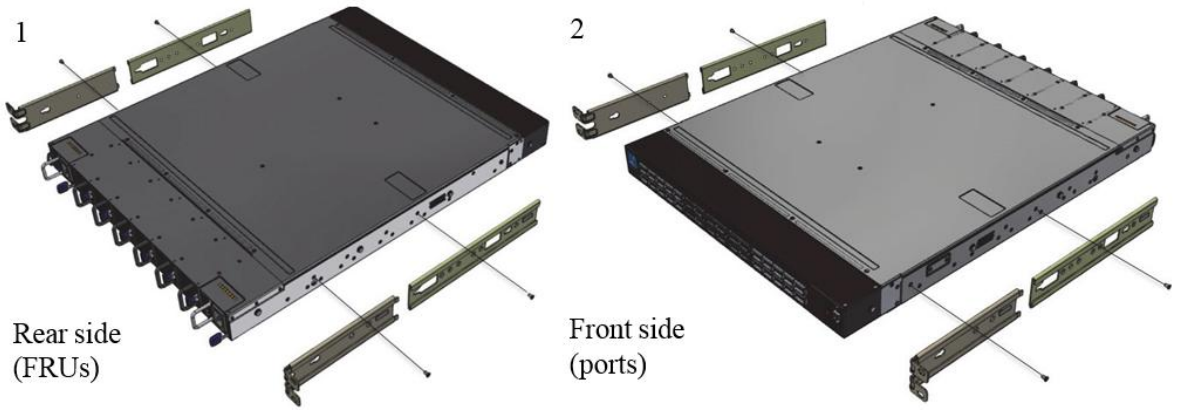
Prerequisites:

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

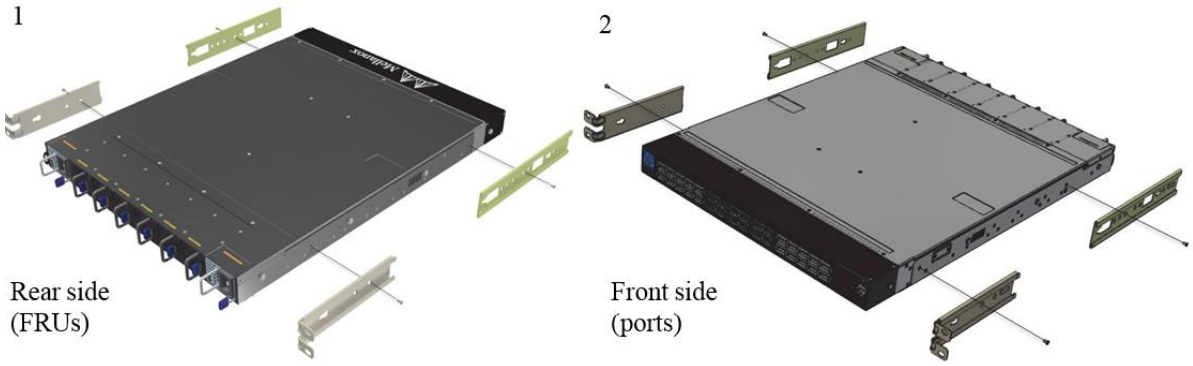
While planning how to place the system, consider the two installation options shown in the figures below, and review the following points:

- Make sure the system air flow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.
- Note that the part of the system to which you choose to attach the rails (the front panel direction, as demonstrated in Option 1 or the FRUs direction, as demonstrated in Option 2) will determine the system's adjustable side. The system's part to which the brackets are attached will be adjacent to the cabinet.
- The FRU side is extractable. Mounting the rack brackets inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

Short Racks (430-580 mm) Installation Options



Standard Racks (580-800 mm) Installation Options



In short racks, the system's ventilation openings should be framed by the designated windows in the rails, as shown below.

Short Racks (430-580 mm) Installation - Side View

Front side (ports):

Rear side (FRUs):

Standard Racks (580-800 mm) Installation - Side View

Front side (ports):

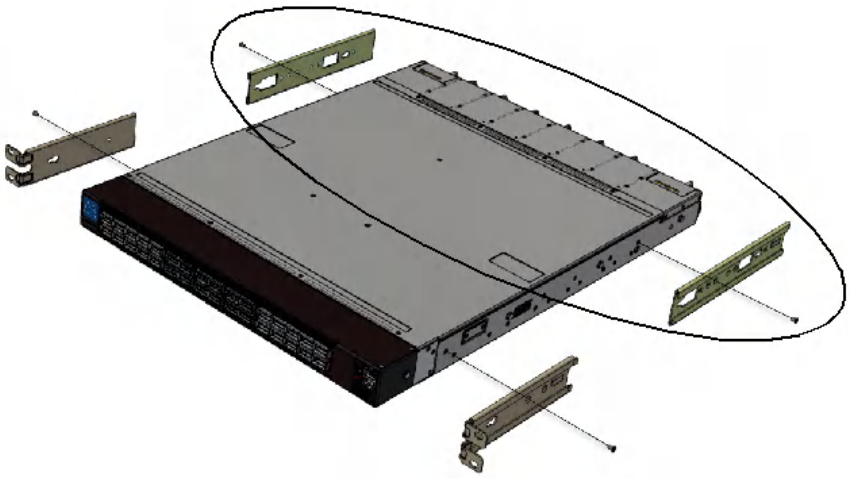
Rear side (FRUs):

To mount the system into the rack:

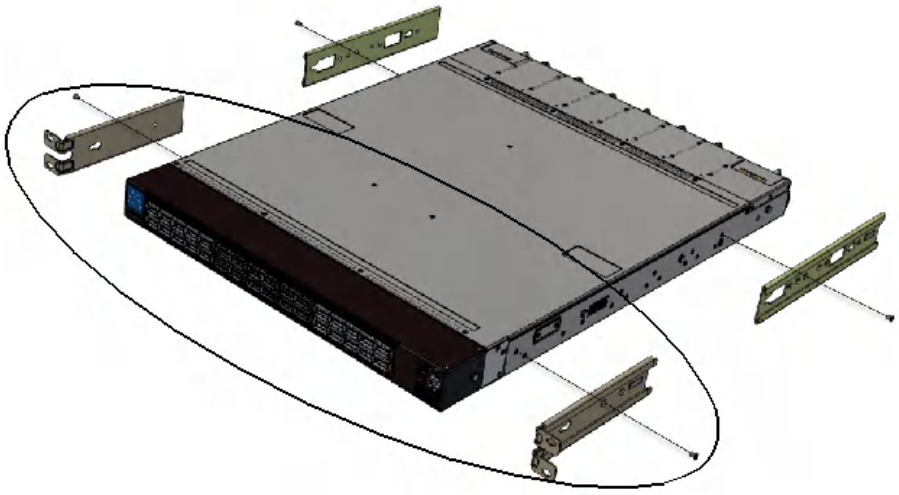
> At least two people are required to safely mount the system in the rack.

> The following steps include illustrations that show front side (ports) installation, yet all instructions apply to all installation options.

1. Attach the left and right rack mount rails (A) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs.
2. Secure the chassis in the rails by screwing 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.
   Attaching the Rails to the Chassis



3. Attach the left and right rack mount ears (C) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs. Secure the system in the brackets by screwing the remaining 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.
   Attaching the Brackets to the Chassis

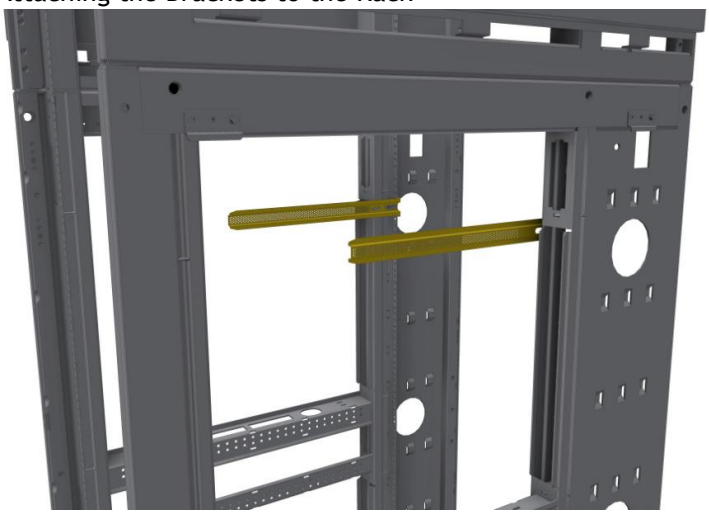


4. Install 8 cage nuts (D) in the desired 1U slots of the rack: 4 cage nuts in the non-extractable side and 4 cage nuts in the extractable side.
   Installing the Cage Nuts

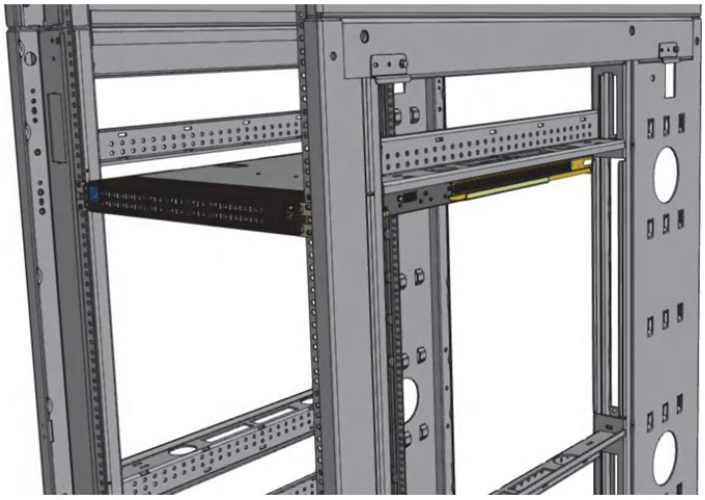
> ⚠ While each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bottom holes only.

While your installation partner is supporting the system's weight, perform the following steps:

5. Attach the two rack mount blades (B) to the back side (FRU side) of the rack by inserting four M6 screws (E) in the designated cage nuts. Do not tighten the screws yet.
   Attaching the Brackets to the Rack



6. Slide the switch with the rails (A) and ears (C) installed on it into the left and right rails (B) on the rack. Use four M6 screws (E) to fix the rack mount ears (C) to the rack. Do not tighten the screws yet.
   Sliding the Blades in the Rails



7. When fully inserted, fix the switch by tightening the 8 screws (E) inserted in Step 5 and Step 6 with a torque of 4.5±0.5.

Removing the System from the Rack

To remove a unit from the rack:

1. Turn off the system and disconnect it from peripherals and from the electrical outlet.
   While your installation partner is supporting the system's weight:
2. Loosen the screws attaching the rack mount ears (C) to the rack. Do not remove them yet.
3. Loosen the screws attaching the rack mount blades (B) to the rack, and pull the blades towards you, while your partner is holding the system.

4. Extract the loosened screws from Step 2 and dismount the system from the rack.
5. Remove the rails and brackets from the chassis by unscrewing 4 screws.

SN3700/SN3700C Telescopic Rail Kit

> This document is preliminary and subject to change.

> The telescopic rail kit is not included in the system's package, and can be purchased separately.

There are two installation kit options:

- Standard depth systems should be mounted using the standard rail kit.
- Short depth systems can be mounted using either of the rail kits.

Kit Part Number	Legacy Kit Part Number	Rack Size and Rack Depth Range
930-9BRKT-00JJ-000	MTEF-KIT-F	600-800 mm

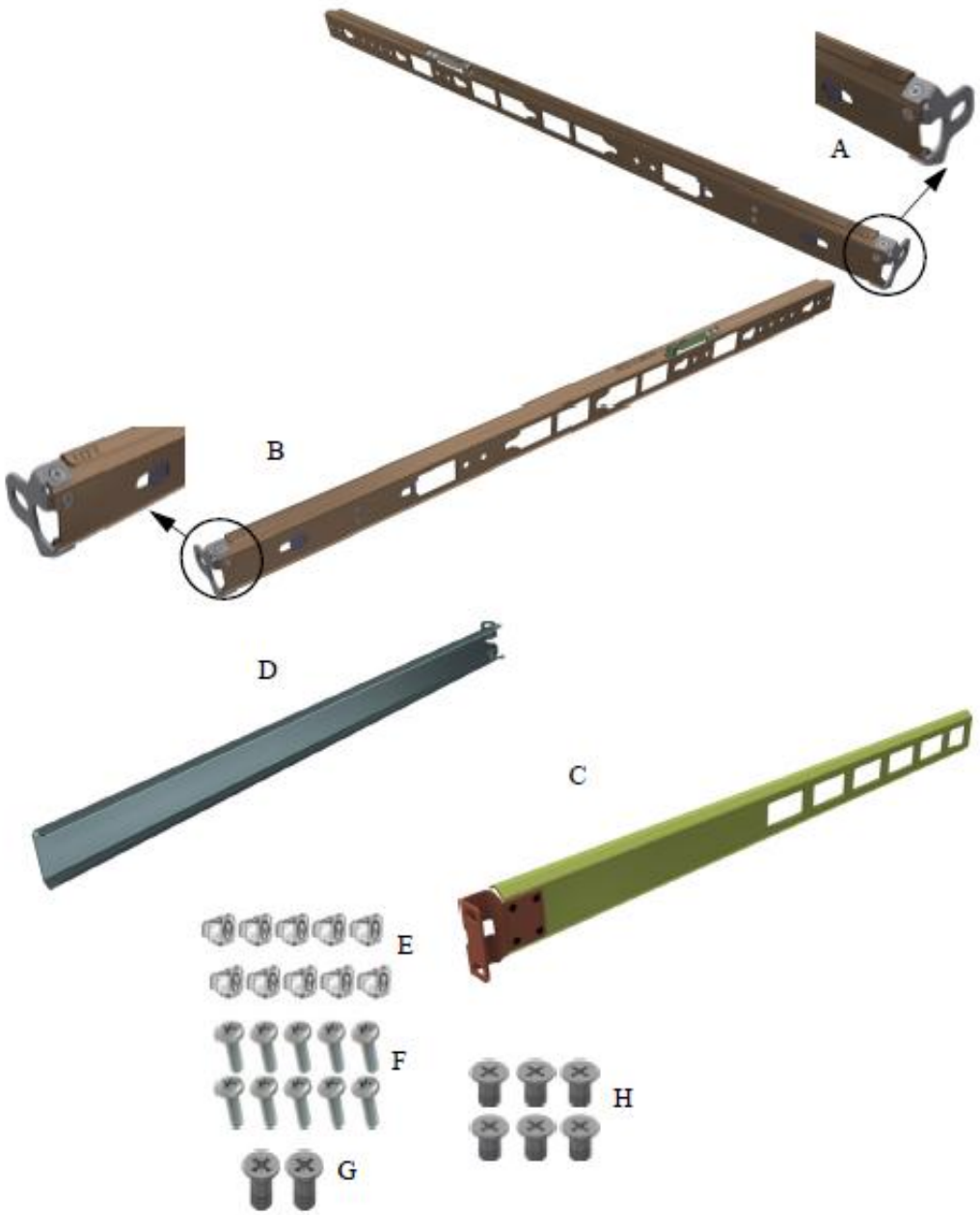
The following parts are included in the rail kit package (see figure below):

- 1x Right side slider (A)
- 1x Left side slider (B)
- 2x Rear rail (C)
- 2x Front rail (D)
- 10x M6 Standard cage nuts[1] [2] (E)
- 10x M6 Standard pan-head Phillips screws[1] (F)
- 2x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screw with around patch (G)
- 6x Flat head 100 DEG Phillips 4-40X3/16" ST.ST patch screws (H)

[1] Other threads are available by special order: M5, 10-32, 12-24

[2] G-type cage-nut is available by special order.

Rack Rail Kit Parts

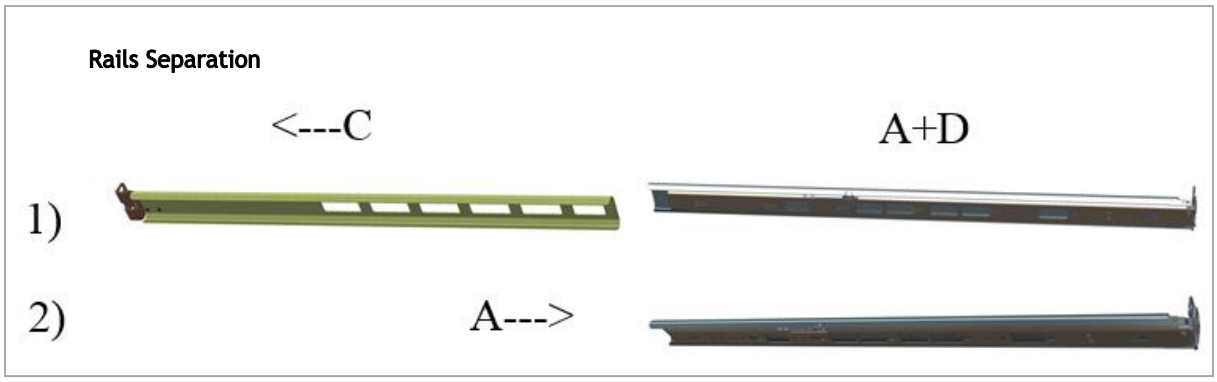


Prerequisites

> ⚠ The rails must be separated prior to the installation procedure.

To separate the rails:

1. Separate rail C from sliders A/B + D.
2. Extend the rail assembly by pulling the extension outwards (D).



Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, review the following points:

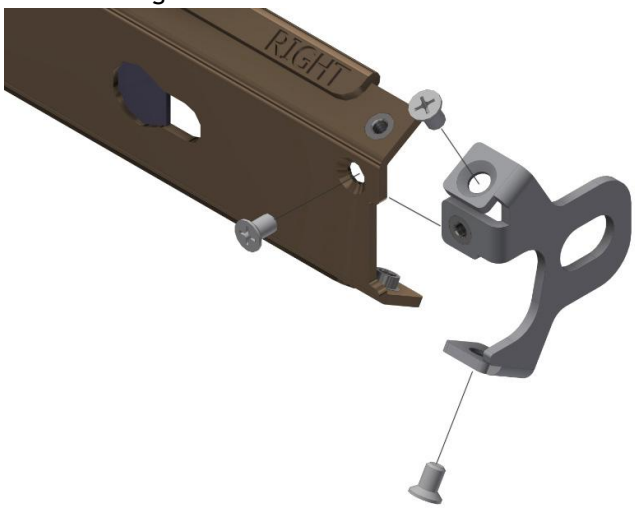
- Make sure the system airflow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.
- In case there are cables that cannot bend within the rack or in case more space is needed for cable bending radius, it is possible to recess the connector side or the FRU side by 3.15" (8cm) by optional placement of the system's rails.
- The FRU side is extractable. Mounting the sliding rail inverted to the system will allow you to slide the FRU side of the system, in and out.

To mount the system into the rack:

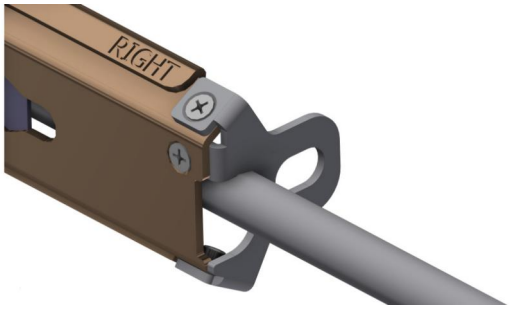
1. Install 10 cage nuts (E) into the desired 1U slot of the rack: 4 cage nuts in the non-extractable side and 6 cage nuts in the extractable side.
   Installing the Cage Nuts

2. Mount both of the outer rails (C+D) into the rack (as illustrated below), and use 8 standard pan-head screws (F) to fix them to the rack. Do not tighten the screws yet.
   Mounting the Outer Rails into the Rack

3. If cable accommodation is required, disassemble any of the inner rails from the brackets attached to them, by removing and scraping the connecting screws.
   Disassembling the Inner Rails for Cable Accommodation

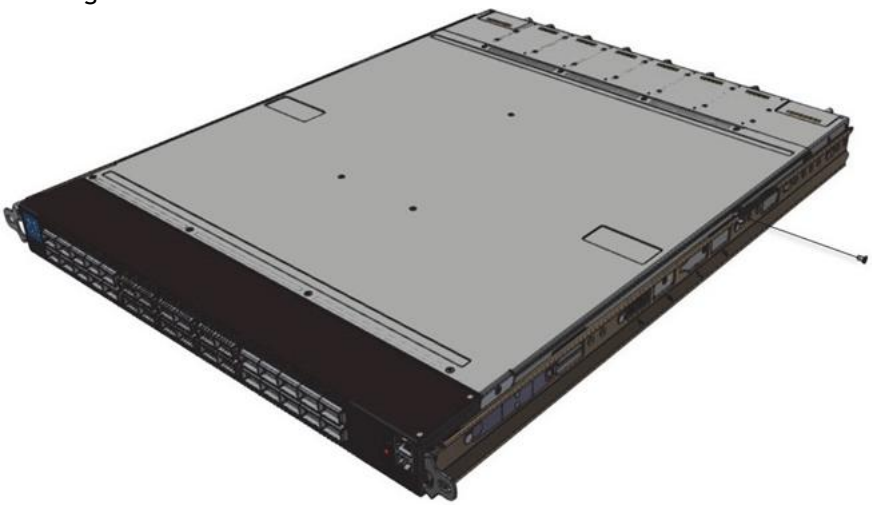


4. Route the power cable through either of the inner rails, and reassemble the brackets by screwing the 3 screws (per rail) provided with the rail-kit (H) with a torque of 0.7±0.05Nm.
   Cable Accommodation

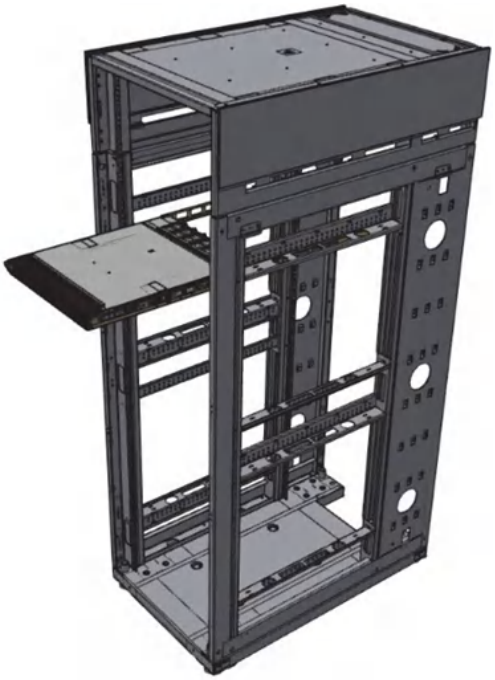


5. Secure the chassis in the inner rails screwing the 2 flat head Phillips screws (G) in the designated points with a torque of 1.5±0.2 Nm.

Securing the Chassis in the Inner Rails



6. Slide the switch into the rack by carefully pushing the inner rails into the outer rails installed on the rack.
   Sliding the Switch into the Rack



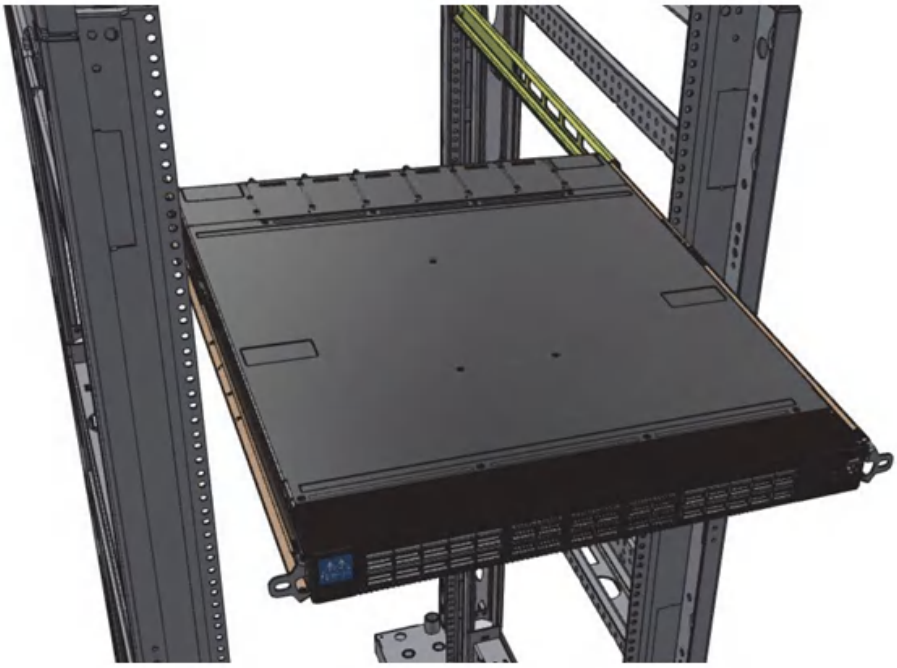
7. When fully inserted, fix the switch by closing the remaining 2 screws in the middle and tightening the 8 screws inserted in Step 2 with a torque of 4.5±0.5 Nm.

Removing the System from the Rack

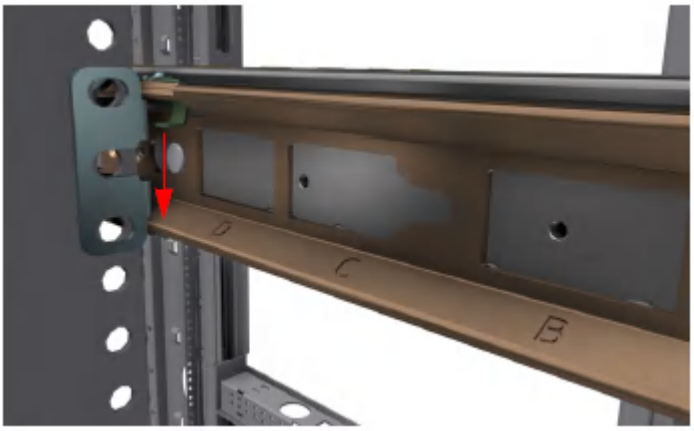
To remove a unit from the rack:

1. Turn off the system and disconnect it from peripherals and from the electrical outlet.
2. Unscrew the two M6 screws securing the front of the inner rails' ears to the outer rails and to the rack.

3. Pull the unit out until braking is felt. For safety purposes, the locking mechanism will not allow a complete removal of the unit at this stage.
   Pulling the Unit Outwards



4. Press on the locking spring (appears in red in the figure below) on both sides simultaneously, and continue pulling the unit towards you until it is fully removed.
   Locking Mechanism



SN3800 Fixed Rail Kit

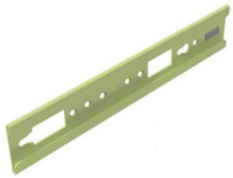
> This document is preliminary and subject to change.

Kit Part Number	Legacy Kit Part Number	Rack Size and Rack Depth Range
930-9BRKT-00JF-000	MTEF-KIT-C	430-800 mm

The following parts are included in the fixed rail kit (see figure below):

- 2x Rack mount rails (A)
- 2x Rack mount blades (B)
- 2x Rack mount ears (C)
- 8x M6 Standard cage nuts (D)
- 8x M6 Standard pan-head Phillips screws (E)
- 4x Flat Head Phillips 100 DEG 6-32X1/4" ST.ST PATCH 360 (F)

Rack Rail Kit Parts

Ax2	Bx2	Cx2
		
Dx8	**Ex8**	**Fx4**
		

Prerequisites:

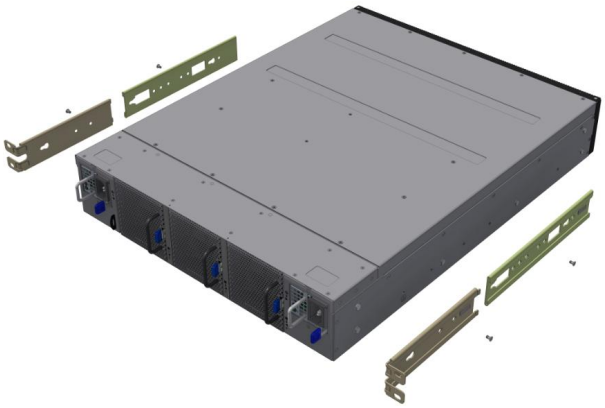
Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, consider the two installation options shown in the figures below, and review the following points:

- Make sure the system air flow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.
- Note that the part of the system to which you choose to attach the rails (the front panel direction, as demonstrated in Option 1 or the FRUs direction, as demonstrated in Option 2) will determine the system's adjustable side. The system's part to which the brackets are attached will be adjacent to the cabinet.
- The FRU side is extractable. Mounting the rack brackets inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

Short Racks (430-580 mm) Installation Options

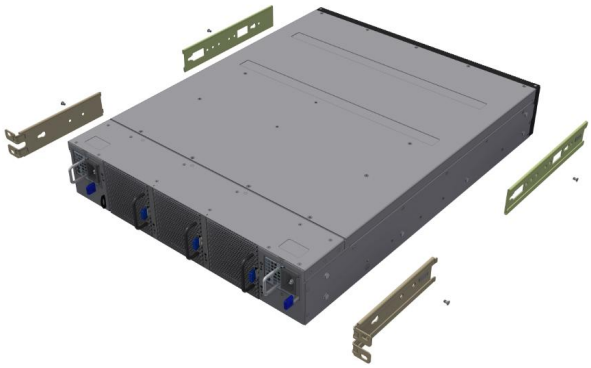
1. Rear side (FRUs)



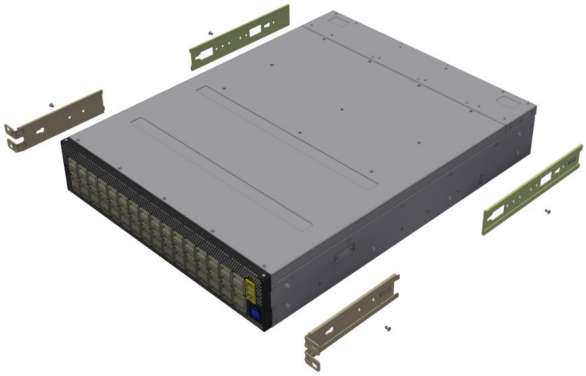
2. Front side (ports)

Standard Racks (580-800 mm) Installation Options

1. Rear side (FRUs)



2. Front side (ports)



Short Racks (430-580 mm) Installation - Side View

Front side (ports):

Rear side (FRUs):

Standard Racks (580-800 mm) Installation - Side View

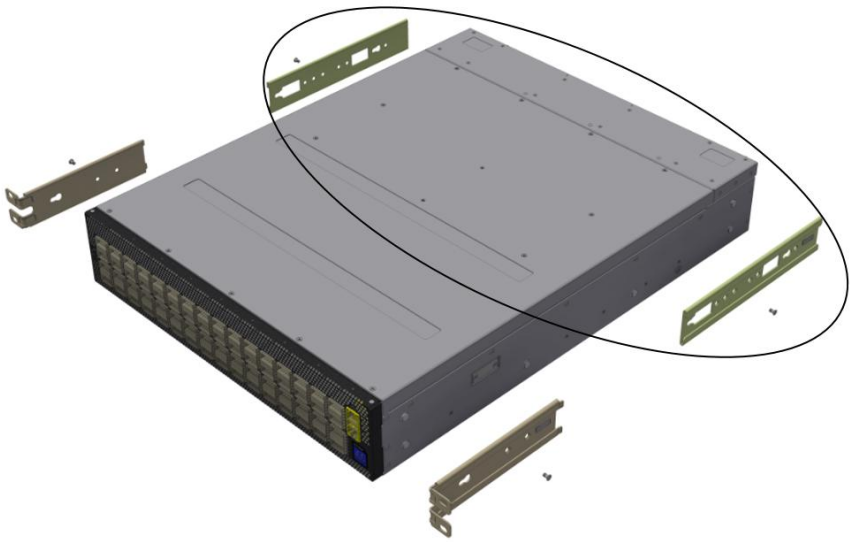
Front side (ports):

Rear side (FRUs):

To mount the system into the rack:

> ⚠ The following steps include illustrations that show front side (ports) installation, yet all instructions apply to all installation options.

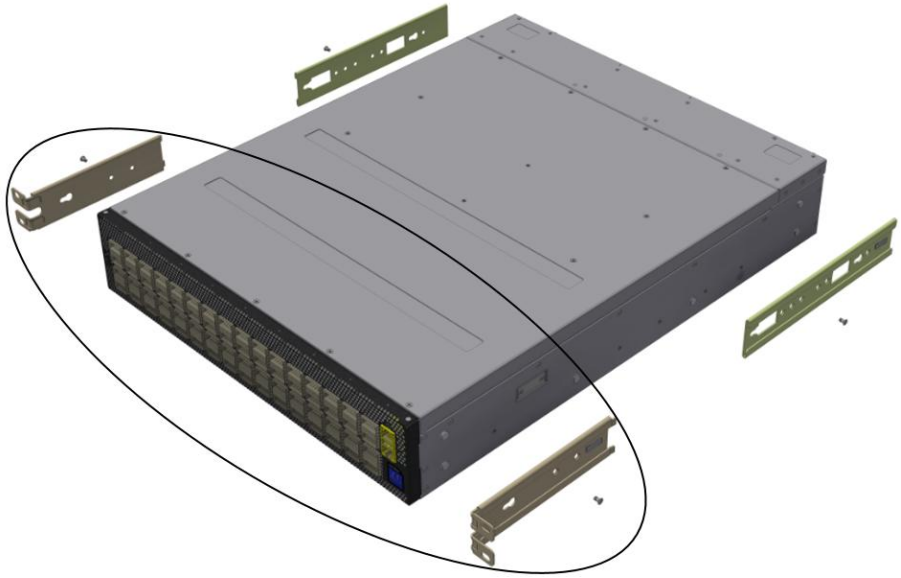
1. Attach the left and right rack mount rails (A) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs.
2. Secure the chassis in the rails by screwing 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.
   Attaching the Rails to the Chassis



3. Attach the left and right rack mount ears (C) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs. Secure the system in the

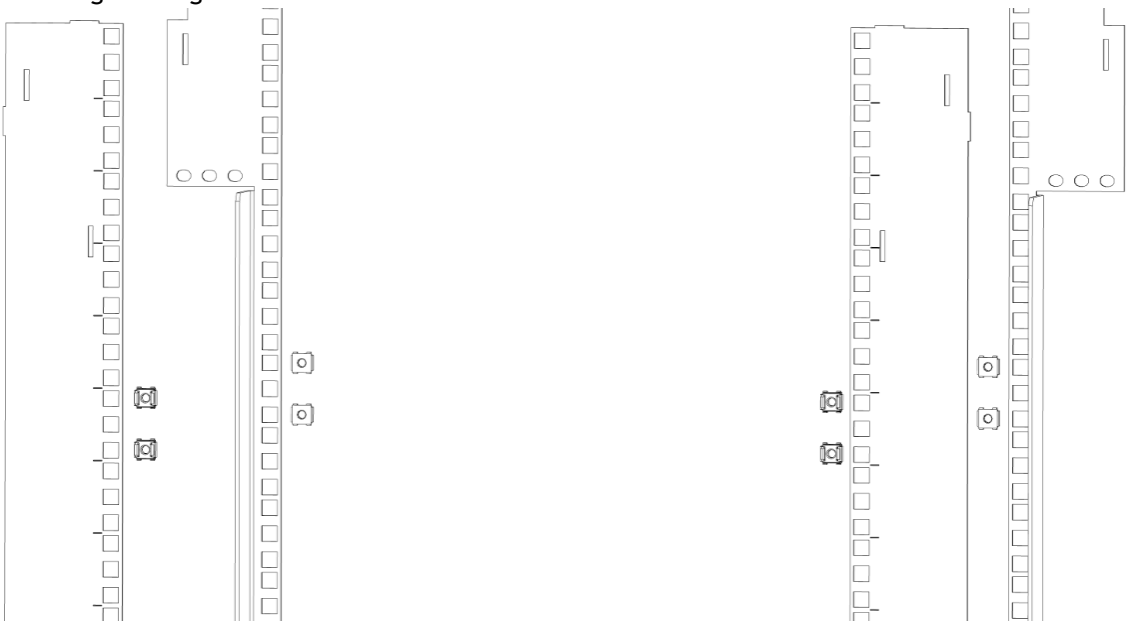
brackets by screwing the remaining 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.

Attaching the Brackets to the Chassis



4. Install 8 cage nuts (D) in the desired 1U slots of the rack: 4 cage nuts in the non-extractable side and 4 cage nuts in the extractable side.

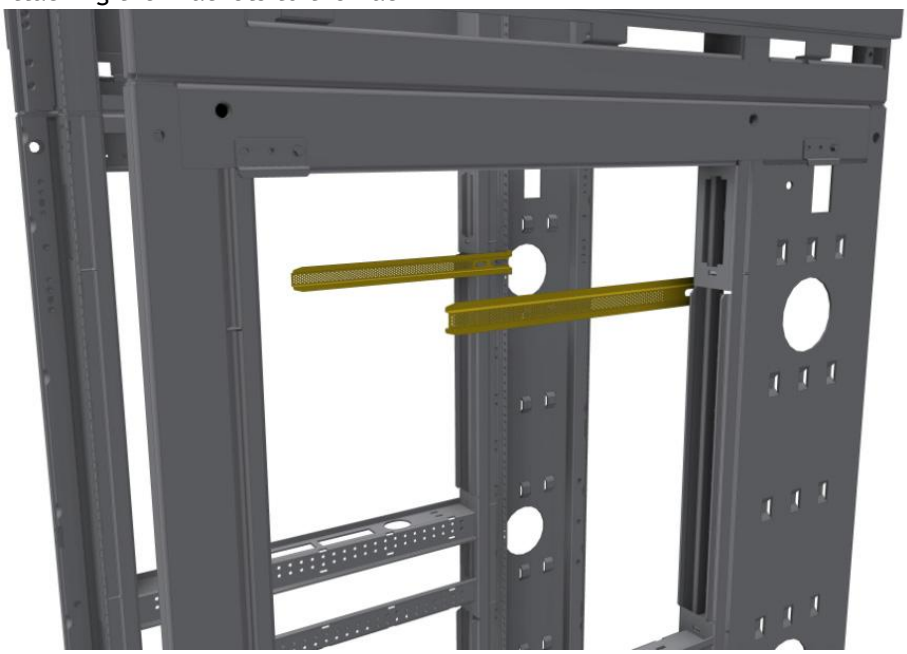
   Installing the Cage Nuts



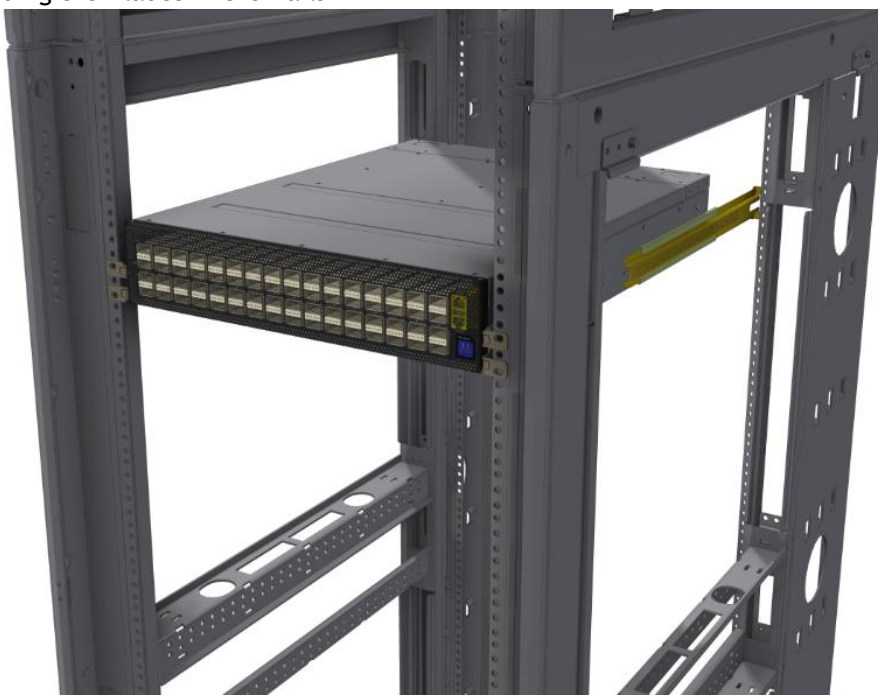
> ⚠ While each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bottom holes only.

While your installation partner is supporting the system's weight, perform the following steps:

5. Attach the two rack mount blades (B) to the back side (FRU side) of the rack by inserting four M6 screws (E) in the designated cage nuts. Do not tighten the screws yet.
   Attaching the Brackets to the Rack



6. Slide the switch with the rails (A) and ears (C) installed on it into the left and right rails (B) on the rack. Use four M6 screws (E) to fix the rack mount ears (C) to the rack. Do not tighten the screws yet.
   Sliding the Blades in the Rails



> At least two people are required to safely mount the system in the rack.

7. When fully inserted, fix the switch by tightening the 8 screws (E) inserted in Step 5 and Step 6 with a torque of 4.5±0.5.

Removing the System from the Rack

To remove a unit from the rack:

1. Turn off the system and disconnect it from peripherals and from the electrical outlet. While your installation partner is supporting the system's weight:
2. Loosen the screws attaching the rack mount ears (C) to the rack. Do not remove them yet.
3. Loosen the screws attaching the rack mount blades (B) to the rack, and pull the blades towards you, while your partner is holding the system.
4. Extract the loosened screws from Step 2 and dismount the system from the rack.
5. Remove the rails and brackets from the chassis by unscrewing 4 screws.

SN3800 Telescopic Rail Kit

This document is preliminary and subject to change.

The telescopic rail kit is not included in the system's package, and can be purchased separately.

There are two installation kit options:

- Standard depth systems should be mounted using the standard rail kit.
- Short depth systems can be mounted using either of the rail kits.

Kit Part Number	Legacy Kit OPN	Rack Size and Rack Depth Range
930-9BRKT-00JJ-000	MTEF-KIT-F	600-800 mm

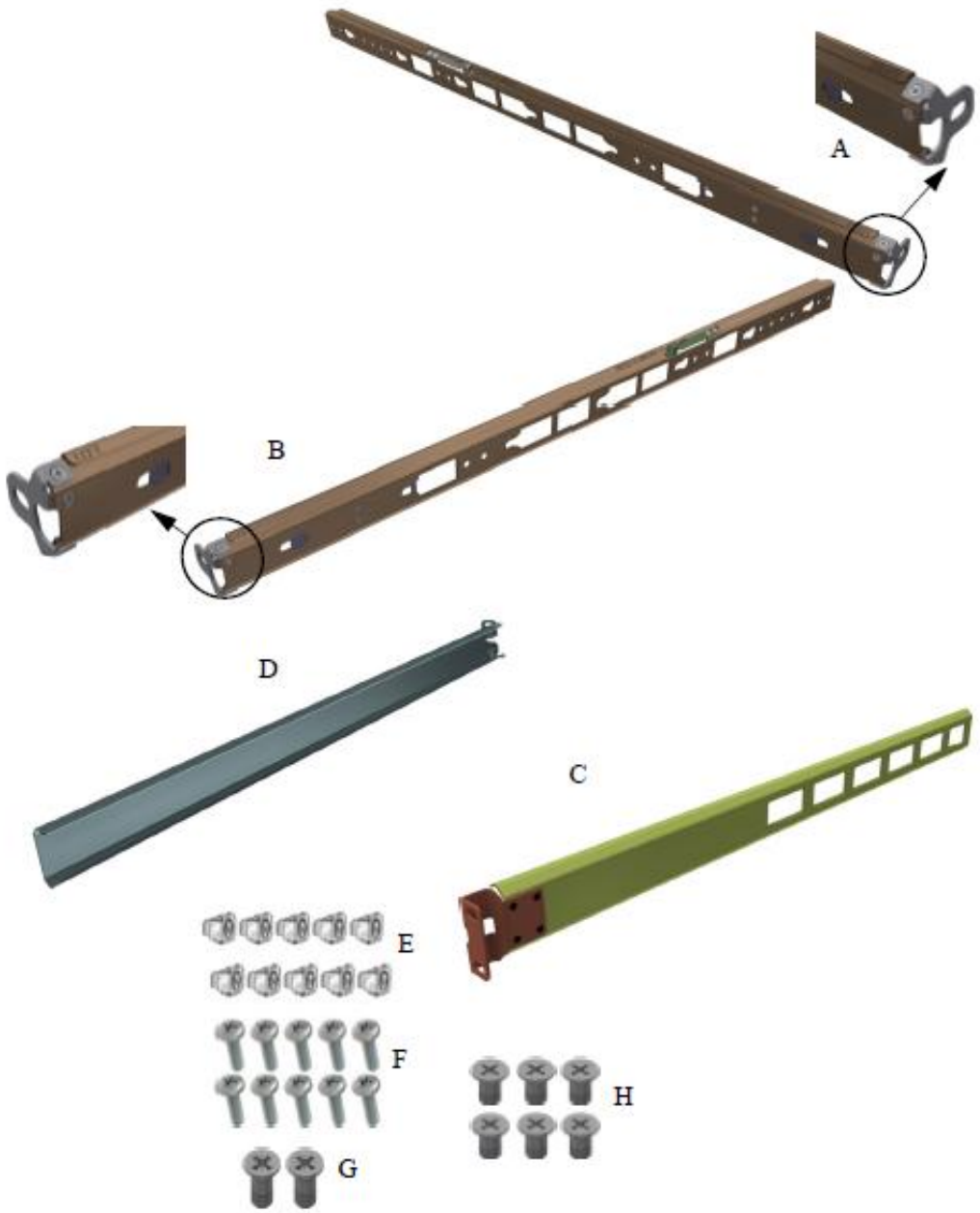
The following parts are included in the rail kit package (see figure below):

- 1x Right side slider (A)
- 1x Left side slider (B)
- 2x Rear rail (C)
- 2x Front rail (D)
- 10x M6 Standard cage nuts[1] [2] (E)
- 10x M6 Standard pan-head Phillips screws[1] (F)
- 2x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screw with around patch (G)
- 6x Flat head 100 DEG Phillips 4-40X3/16" ST.ST patch screws (H)

[1] Other threads are available by special order: M5, 10-32, 12-24

[2] G-type cage-nut is available by special order.

Rack Rail Kit Parts

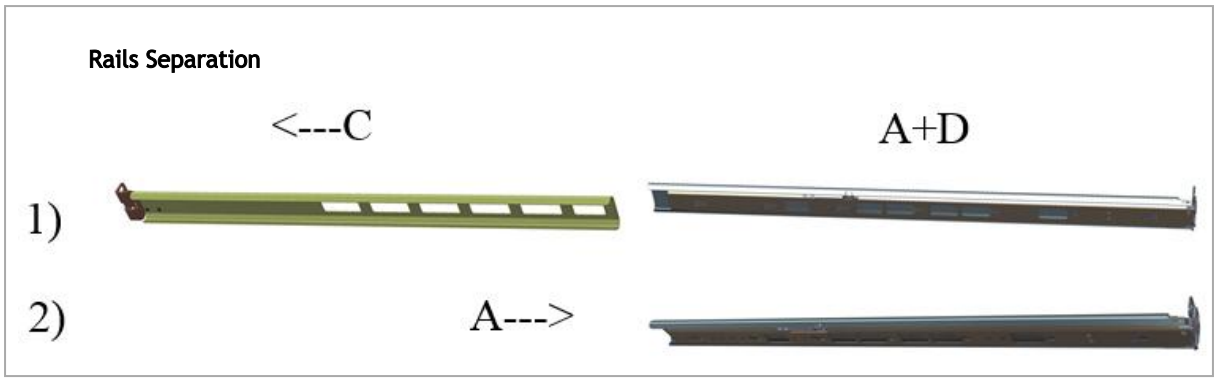


Prerequisites

> ⚠ The rails must be separated prior to the installation procedure.

To separate the rails:

1. Separate rail C from sliders A/B + D.
2. Extend the rail assembly by pulling the extension outwards (D).



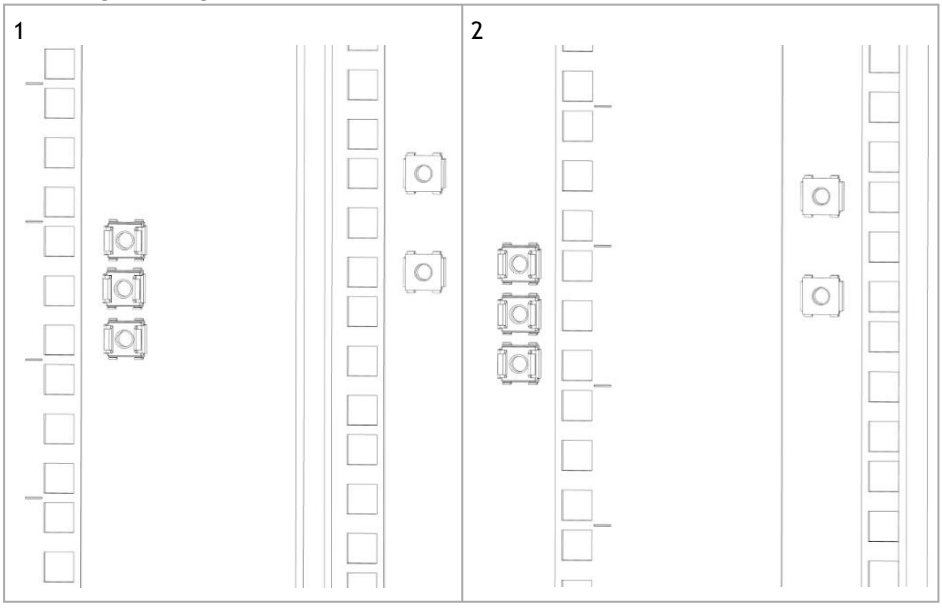
Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, review the following points:

- Make sure the system airflow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.
- In case there are cables that cannot bend within the rack or in case more space is needed for cable bending radius, it is possible to recess the connector side or the FRU side by 3.15" (8cm) by optional placement of the system's rails.
- The FRU side is extractable. Mounting the sliding rail inverted to the system will allow you to slide the FRU side of the system, in and out.

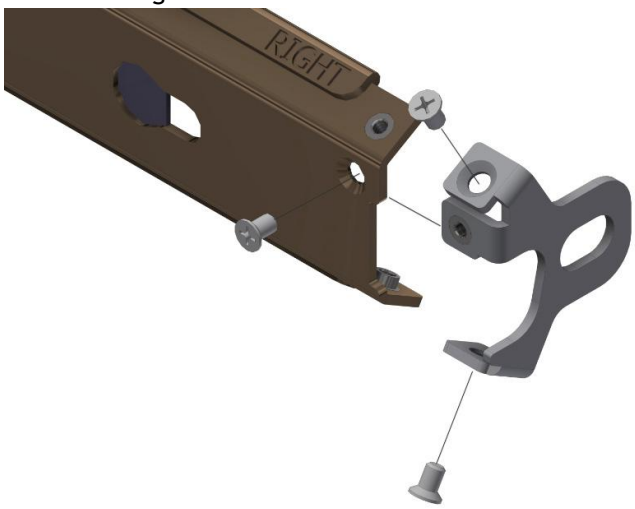
To mount the system into the rack:

1. Install 10 cage nuts (E) into the desired 1U slot of the rack: 4 cage nuts in the non-extractable side and 6 cage nuts in the extractable side.
   Installing the Cage Nuts

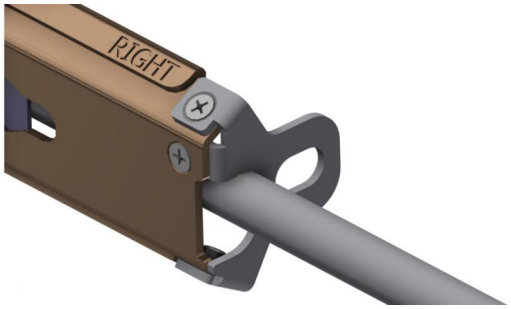


2. Mount both of the outer rails (C+D) into the rack (as illustrated below), and use 8 standard pan-head screws (F) to fix them to the rack. Do not tighten the screws yet.
   Mounting the Outer Rails into the Rack

3. If cable accommodation is required, disassemble any of the inner rails from the brackets attached to them, by removing and scraping the connecting screws.
   Disassembling the Inner Rails for Cable Accommodation



4. Route the power cable through either of the inner rails, and reassemble the brackets by screwing the 3 screws (per rail) provided with the rail-kit (H) with a torque of 0.7±0.05Nm.
   Cable Accommodation



5. Secure the chassis in the inner rails screwing the 2 flat head Phillips screws (G) in the designated points with a torque of 1.5±0.2 Nm.

Securing the Chassis in the Inner Rails

6. Slide the switch into the rack by carefully pushing the inner rails into the outer rails installed on the rack.
   Sliding the Switch into the Rack

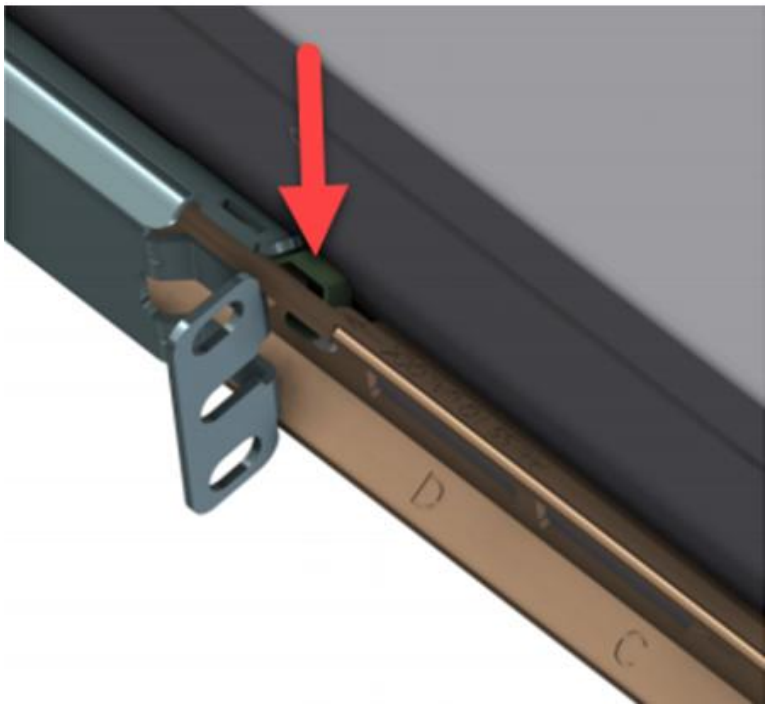
7. When fully inserted, fix the switch by closing the remaining 2 screws in the middle and tightening the 8 screws inserted in Step 2 with a torque of 4.5±0.5 Nm.

Removing the System from the Rack

To remove a unit from the rack:

1. Turn off the system and disconnect it from peripherals and from the electrical outlet.
2. Unscrew the two M6 screws securing the front of the inner rails' ears to the outer rails and to the rack.
3. Pull the unit out until braking is felt. For safety purposes, the locking mechanism will not allow a complete removal of the unit at this stage.
   Pulling the Unit Outwards
   
4. Press on the locking spring (appears in red in the figure below) on both sides simultaneously, and continue pulling the unit towards you until it is fully removed.

Locking Mechanism



Cable Installation

Power Cable and Cable Retainer

In some switch models, the product's package includes cable retainers. It is highly recommended to use them in order to secure the power cables in place.

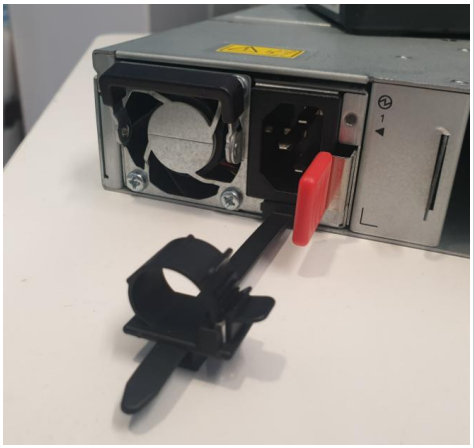
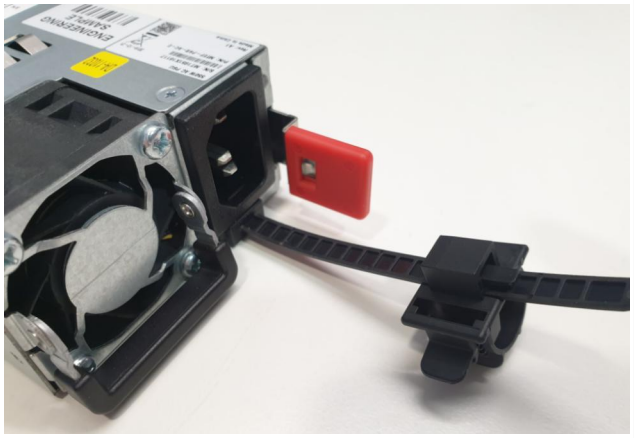
When installing retainers for the PSUs of the SN3420 switch systems, please adhere to the following instructions:

1. Verify the integrity of the retainer assembly, as demonstrated in the below table:- The snaps' push-pins must have visible edges with no broken or torn parts.
   - The shoulders' pins should be in-tact and must not be bent inwards.

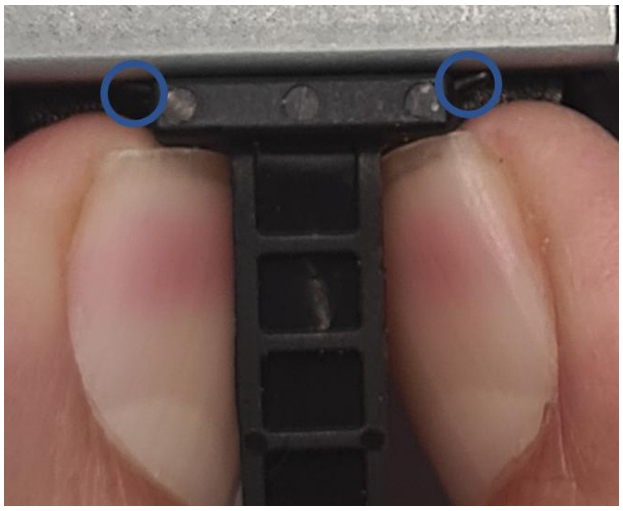
Proper Condition	Improper Condition
	

2. It is advised to place the PSU on a flat, stable surface. While you secure the PSU in place, use two thumbs to insert the retainer's two snaps into the designated holes located near the AC inlet. Make sure that the retainer's plastic loop is facing upwards, as demonstrated in the below table.

> ⚠ For demonstration purposes, the images in this document show C2P (Connector-to-Power) airflow PSUs with red latches, yet the instructions apply to P2C (Power-to-Connector) PSUs with blue latches as well.

Correct Insertion	Incorrect Insertion
	

3. Push the retainer until the shoulders' pins (in blue circles below) are open and aligned with the PSU front panel, as shown in the following table:

Fully Mated Retainer	
	

4. Make sure that the retainer is fully locked in place by gently attempting to pull it outwards.
5. Open the plastic loop and route the AC cord through it. Locate the loop over the AC cord, as shown in the following table, and fasten it tightly.

Proper Loop Placement	Improper Loop Placement
	

Each cable retainer can be used once only. Once the retainer has been fully inserted and the shoulders' pins have been adjusted, the retainer cannot be used again, and should be discarded if pulled out.

Port Cables

All cables can be inserted or removed with the unit powered on.

To insert a cable, press the connector into the port receptacle until the connector is firmly seated. The LED indicator, corresponding to each data port, will light when the physical connection is established. When a logical connection is made, the relevant port LED will turn on.

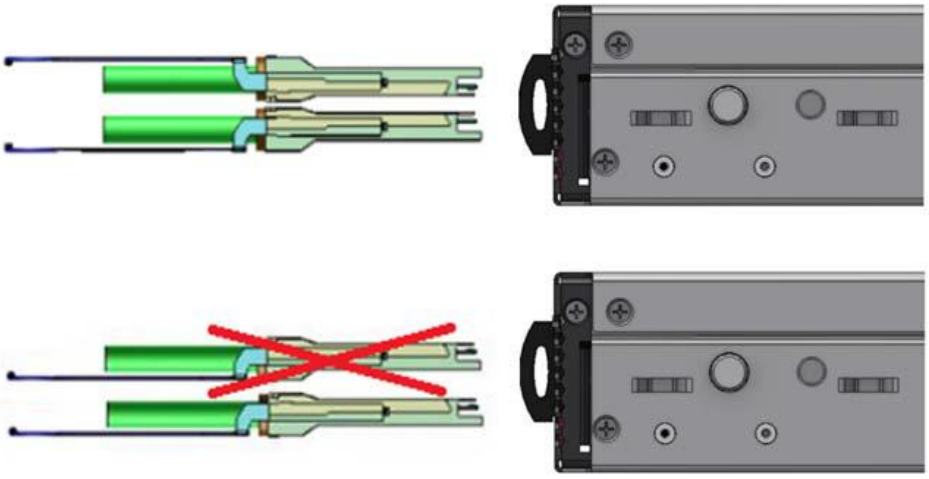
To remove a cable, disengage the locks and slowly pull the connector away from the port receptacle. The LED indicator for that port will turn off when the cable is unseated.

For full cabling guidelines, please refer to the NVIDIA Cable Management Guidelines and FAQ.

For more information about port LEDs, refer to Port LEDs.

> Do not force the cable into the cage with more than 40 newtons / 9.0 pounds / 4kg force. Greater insertion force may cause damage to the cable or to the cage.

QSFP Cable Orientation



Splitter (Breakout) Cables and Adapters

The 200GbE ports in the SN3700 systems can be split to two 100GbE ports, or to four (or less) 50GbE ports, using a NVIDIA splitter cable.
The 100GbE ports in the SN3700C systems can be split to two 50GbE ports, or to four (or less) 25GbE ports, using a NVIDIA splitter cable.

The 100GbE ports in the SN3800 systems can be split to two 50GbE ports, or to four (or less) 25GbE ports, using a NVIDIA splitter cable. Splitting a 100GbE QSFP28 port to 4 separate 25GbE ports (using a splitter cable) disables (unmaps) the 100GbE port above or below it. See "SN3800 Splitting Options" below.

The 100GbE ports in the SN3420 systems can be split to four (or less) 50GbE ports, using a NVIDIA splitter cable.

Using Splitter (Breakout) Cables with NVIDIA Onyx (MLNX-OS)

When using this feature, you should log into the NVIDIA Onyx (MLNX-OS) CLI and configure the individual ports to be ‘split-2’ or ‘split-4’. For further information on NVIDIA’s cable, visit http://www.mellanox.com/page/interconnect_overview.

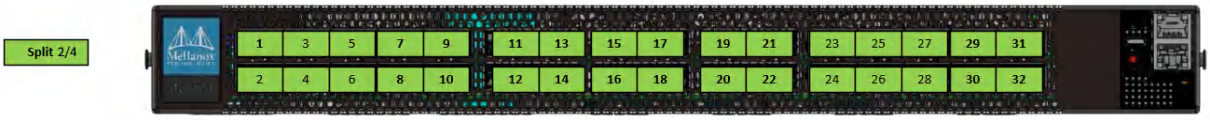
Using Splitter (Breakout) Cables with Cumulus Linux

If you are using 4x10G direct attach copper cables or active optical cables, edit the `/etc/cumulus/ports.conf` to enable support for these cables, then restart the switchd service using the `sudo systemctl restart switchd` command. For more details, see Layer 1 and Switch Port Attributes in the Cumulus Linux User Guide.

Examples of Splitter (Breakout or Fanout) Cables

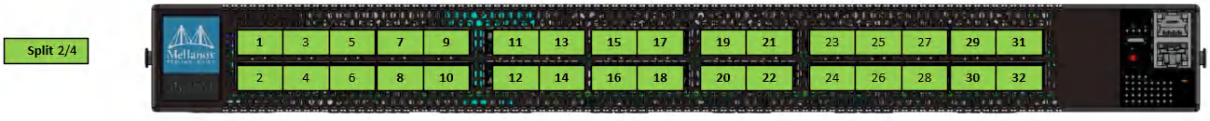
SN3700 Splitting Options

All ports can be split to either 2 QSFP56 ports or 4 SFP56 ports. None of the ports are blocked.



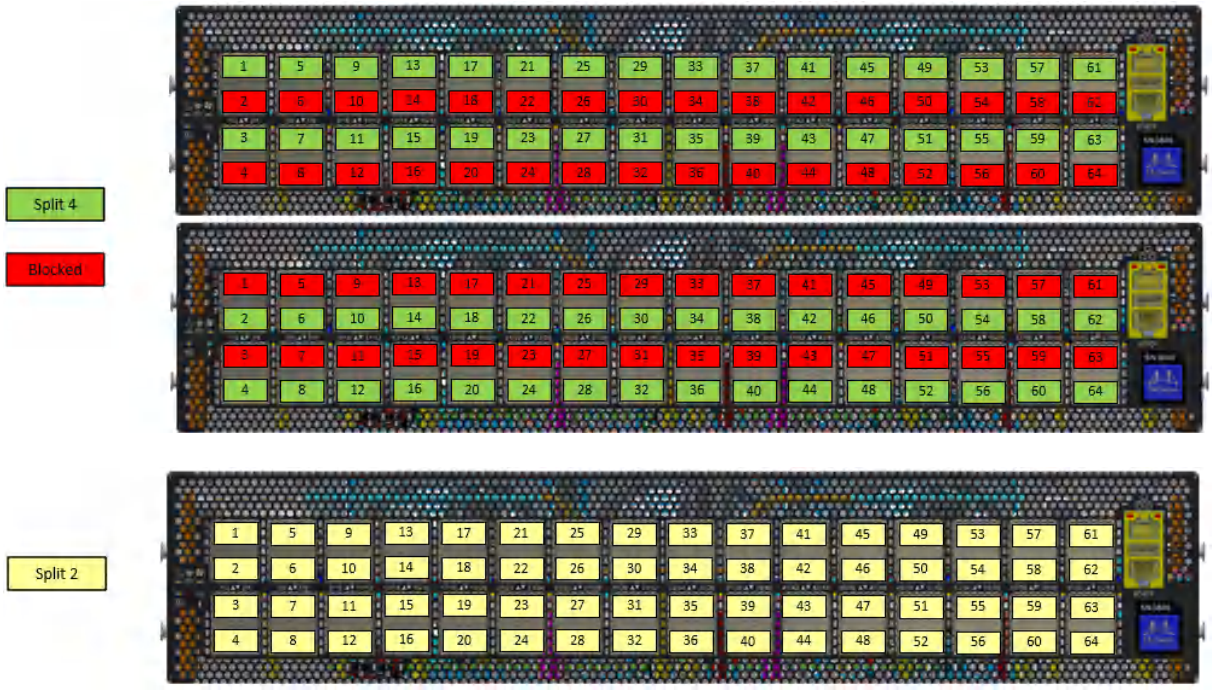
SN3700C Splitting Options

All ports can be split to either 2 QSFP28 ports or 4 SFP28 ports. None of the ports are blocked.



SN3800 Splitting Options

All ports can be split to either 2 SFP28 ports (yellow) or 4 SFP28 ports (green). Splitting a port to 4 interfaces will block the adjacent port.



SN3420 Splitting Options

Ports 49-60 can be split to either two QSFP28 ports or four SFP28 ports. None of the ports are blocked.

Initial Power On

Each system's input voltage is specified in the Specifications chapter.

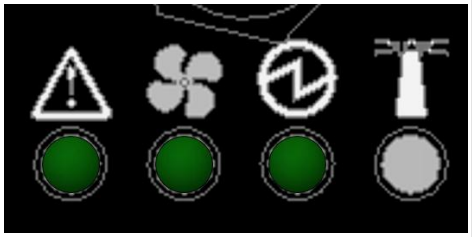
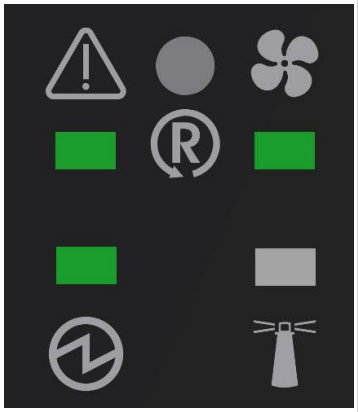
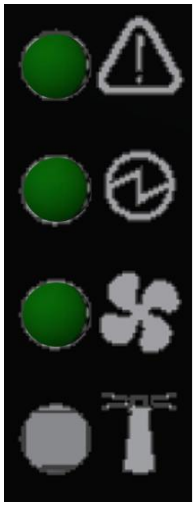
The power cords should be standard 3-wire AC power cords including a safety ground and rated for 15A or higher.

> The system platform will automatically power on when AC power is applied. There is no power system. Check all boards, power supplies, and fan tray modules for proper insertion before plugging in a power cable.

1. Plug in the first power cable.
2. Plug in the second power cable.
3. Wait for the System Status LED to turn green.

It may take up to five minutes to turn on the system. If the System Status LED shows amber after five minutes, unplug the system and call your NVIDIA representative for assistance.

4. Check the System Status LEDs and confirm that all of the LEDs show status lights consistent with normal operation as shown in the figure below. For more information, refer to "LEDs".

SN3700/SN3700C	SN3800	SN3420
		

After inserting a power cable and confirming the green System Status LED light is on, make sure that the Fan Status LED shows green.
If the Fan Status LED is not green, unplug the power connection and check that the fan module is inserted properly and that the mating connector of the fan unit is free of any dirt and/or obstacles. If no obstacles were found and the problem persists, call your NVIDIA representative for assistance.

Two Power Inlets - Electric Caution Notifications:

- Risk of electric shock and energy hazard. The two power supply units are independent. Disconnect all power supplies to ensure a powered down state inside of the switch platform.
- ACHTUNG Gafahr des elektrischen Schocks. Entferrnen des Netzsteckers elnes Netzteils spannungsfrei. Um alle Einhieten spannungsfrei zu machen sind die Netzstecker aller Netzteile zu entfernen.
- ATTENTION Risque de choc et de danger e'lectriques. Le de'branchment d'une seule alimentation stabilise'e ne de'branch uniquement qu'un module "Alimentation Stabilise'e". Pour isoler completement le module en cause, Il faut de'brancher toutes les alimentations stabilise'es.

System Bring-Up

For bring-up of a switch system with NVIDIA Onyx (MLNX-OS) operating system installed, see Configuring Network Attributes Using NVIDIA Onyx (MLNX-OS).

For bring-up of a switch system with Cumulus Linux operating system installed, see Configuring Network Attributes Using Cumulus Linux.

Configuring Network Attributes Using NVIDIA Onyx (MLNX-OS)

The procedures described in this chapter assume that you have already installed and powered on the system according to the instructions in this document. The system comes with a pre-configured DHCP. If you wish to disable it, refer to Disable Dynamic Host Configuration Protocol (DHCP). In case a manual configuration is required, please refer to the instructions in Manual Host Configuration.

Manual Host Configuration

To perform initial configuration of the system:

Step 1. Connect a host PC to the Console RJ45 () port of the system, using the supplied harness cable (DB9 to RJ45). Make sure to connect to the Console RJ45 port and not to the (Ethernet) MGT () port.

Step 2. Configure a serial terminal program (for example, HyperTerminal, minicom, or Tera Term) on your host PC with the settings described in the table below. Once you perform that, you should get the CLI prompt of the system.

Serial Terminal Program Configuration

Parameter	Setting
Baud Rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow Control	None

Step 3. Login as admin and use admin as password. On the first login, the NVIDIA Onyx (MLNX-OS) configuration wizard will start.

Step 4. To configure network attributes and other initial parameters to the system, follow the configuration wizard as shown in the Configuration Wizard Session table below.

Configuration Wizard Session

Wizard Session Display	Comments
NVIDIA configuration wizard Do you want to use the wizard for initial configuration? yes	You must perform this configuration the first time you operate the system or after resetting the system. Type ‘y’ and then press <Enter>.
Step 1: Hostname? [switch-1]	If you wish to accept the default hostname, press <Enter>. Otherwise, type a different hostname and press <Enter>.
Step 2: Use DHCP on mgmt0 interface? [no] yes	Perform this step to obtain an IP address for the system. (mgmt0 is the management port of the system). If you wish the DHCP server to assign the IP address, type ‘yes’ and press <Enter>. If you type ‘no’ (no DHCP), then you will be asked whether you wish to use the ‘zeroconf’ configuration or not. If you enter ‘no’ (no Zeroconf), you must enter a static IP, and the session will continue.
Step 3: Enable IPv6? [yes]	The management interface will be able to use IPv6 addresses. If you enter "no" (no IPv6), you will automatically be referred to Step 6.
Step 4: Enable IPv6 auto-config (SLAAC) on mgmt0 interface? [no]	This turns on auto-configuration of the IPv6 addresses. This is unsuitable for DHCPv6.
Step 5: Enable DHCPv6 on mgmt0 interface? [no]	To enable DHCPv6 on the MGMT0 interface.
Step 6: Admin password (Press <Enter> to leave unchanged)? <new_password> Step 6: Confirm admin password? <new_password>	To avoid illegal access to the machine, please type a password and then press <Enter>. Then confirm the password by re-entering it. Note that password characters are not printed.
You have entered the following information: <A summary of the configuration is now displayed.> To change an answer, enter the step number to return to or hit <enter> to save changes and exit. Choice: <Enter> Configuration changes saved.	The wizard displays a summary of your choices and then asks you to confirm the choices or to re-edit them. Either press <Enter> to save changes and exit, or enter the configuration step number that you wish to return to. *Note: To re-run the configuration wizard, run the command “configuration jump-start” in Config mode.*

The table below shows an example of static IP configuration for mgmt0 interface.

Configuration Wizard Session - Static IP Configuration

```
Mellanox configuration wizard

Do you want to use the wizard for initial configuration? yes

Step 1: Hostname? []
Step 2: Use DHCP on mgmt0 interface? [yes] no
Step 3: Use zeroconf on mgmt0 interface? [no]
Step 4: Primary IP address? [for example 192.168.10.4] 10.10.10.10
Mask length may not be zero if address is not zero (interface eth0)
Step 5: Netmask? [0.0.0.0] 255.255.255.0
```

```
Step 6: Default gateway? [for example 192.168.10.1] 10.10.10.255
Step 7: Primary DNS server?
Step 8: Domain name?
Step 9: Enable IPv6? [yes]
Step 10: Enable IPv6 autoconfig (SLAAC) on mgmt0 interface? [no]
Step 11: Admin password (Enter to leave unchanged)?

To change an answer, enter the step number to return to.
Otherwise hit <enter> to save changes and exit.
Choice:
Configuration changes saved.

To return to the wizard from the CLI, enter the "configuration jump-start"
command from configure mode. Launching CLI...
```

Step 5. Before attempting a remote (for example, SSH) connection to the system, check the mgmt0 interface configuration. Specifically, verify the existence of an IP address. To check the current mgmt0 configuration, enter the following command:

```
switch01 (config) # show interfaces mgmt0
Interface mgmt0 status:
  Comment:
  Admin up:           yes
  Link up:            yes
  DHCP running:       yes
  IP address:         192.168.1.100
  Netmask:            255.255.255.0
  IPv6 enabled:       yes
  Autoconf enabled:   no
  Autoconf route:     yes
  Autoconf privacy:   no
  DHCPv6 running:     no
  IPv6 addresses:     1
  IPv6 address:       fe80::202:c9ff:fe63:b55a/64
  Speed:              1000Mb/s (auto)
  Duplex:             full (auto)
  Interface type:     ethernet
  Interface source:   physical
  MTU:                1500
  HW address:         00:02:C9:63:B5:5A

  RX bytes:           968810197       TX bytes:         1172590194
  RX packets:         10982099        TX packets:       10921755
  RX mcast packets:   0               TX discards:      0
  RX discards:        0               TX errors:        0
  RX errors:          0               TX overruns:      0
  RX overruns:        0               TX carrier:       0
  RX frame:           0               TX collisions:    0
                                      TX queue len:       1000

switch01 (config) #
```

Step 6. Check the software version embedded in your system, using the command 'show version'. Compare this version to the latest version that can be retrieved from NVIDIA support site. To upgrade software, please refer to the *NVIDIA Onyx (MLNX-OS) User Manual*.

Disable Dynamic Host Configuration Protocol (DHCP)

DHCP is used for automatic retrieval of management IP addresses.

If a user connects through SSH, runs the wizard and turns off DHCP, the connection is immediately terminated, as the management interface loses its IP address. In such a case, the serial connection should be used.

<localhost># ssh admin@<ip-address>

```
Mellanox Onyx (MLNX-OS) Switch Management
Password:
Mellanox Switch
Mellanox configuration wizard
```

```
Do you want to use the wizard for initial configuration? yes
Step 1: Hostname? [my-switch]
Step 2: Use DHCP on mgmt0 interface? [yes] no
<localhost>#
```

Remote Connection with NVIDIA Onyx (MLNX-OS)

Once the network attributes are set, you can access the CLI via SSH or the WebUI via HTTP/ HTTPs.

To access the CLI, perform the following steps:

1. Set up an Ethernet connection between the system and a local network machine using a standard RJ45 connector.
2. Start a remote secured shell (SSH) using the command: ssh -l <username> <IP_address>

```
# ssh -l <username> <ip_address>
Mellanox Onyx (MLNX-OS) Switch Management

Password:
```

3. Login as admin (default username is *admin*, password is *admin*).
4. Once you get the CLI prompt, you are ready to use the system.

For additional information about NVIDIA Onyx (MLNX-OS), refer to the *NVIDIA Onyx (MLNX-OS) User Manual* located on the NVIDIA Networking Documentation Website.

Configuring Network Attributes Using Cumulus Linux

For Cumulus Linux initial configuration instructions, see Configuring Cumulus Linux in the Cumulus Linux Quick Start Guide.

Remote Connection with Cumulus Linux

Cumulus Linux uses the OpenSSH package to provide SSH functionality. To securely access a Cumulus Linux switch remotely, please follow the instructions on the "SSH for Remote Access" page in the Cumulus Linux User Guide.

FRU Replacements

⚠ For a list of the FRU replacements, see “Accessory and Replacement Parts”.

Power Supplies

NVIDIA systems that are equipped with two replaceable power supply units work in a redundant configuration. Either unit may be extracted without bringing down the system.

Make sure that the power supply unit that you are NOT replacing is showing green for the power supply unit LED.

Power supply units have directional air flows similar to the fan module. The fan module airflow must coincide with the airflow of all of the power supply units. If the power supply unit airflow direction is different from the fan module airflow direction, the system's internal temperature will be affected. For power supply unit air flow direction, refer to Air Flow.

To extract a power supply unit:

1. Remove the power cord from the power supply unit.
2. Grasping the handle with your hand, push the latch release with your thumb while pulling the handle outward. As the power supply unit unseats, the power supply unit status LEDs will turn off.
3. Remove the power supply unit.

PS Unit Pulled Out

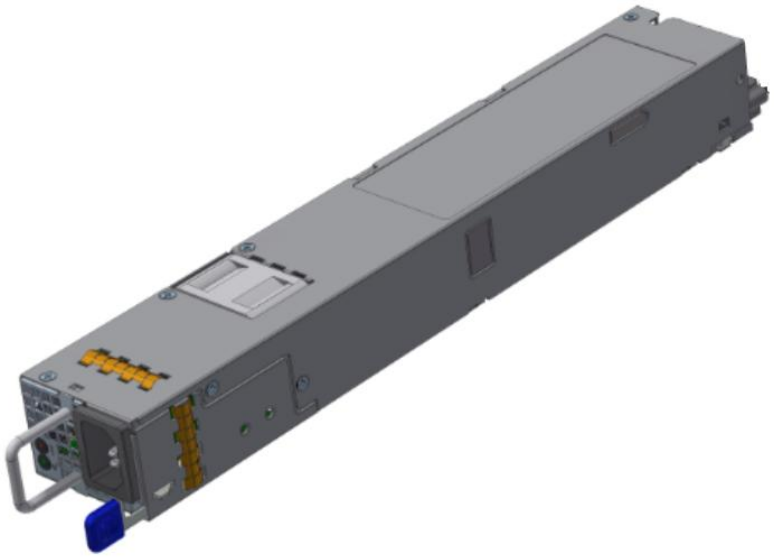


*Illustration only. The design may vary in different systems.

To insert a power supply unit:

1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.

   Do not attempt to insert a power supply unit with a power cord connected to it.

2. Insert the power supply unit by sliding it into the opening, until a slight resistance is felt.
3. Continue pressing the power supply unit until it seats completely. The latch will snap into place, confirming the proper installation.
4. Insert the power cord into the supply connector.
5. Insert the other end of the power cord into an outlet of the correct voltage.

The green power supply unit indicator should light. If it does not, repeat the whole procedure to extract the power supply unit and re-insert it.

Fans

The system can fully operate if one fan FRU is dysfunctional. Failure of more than one fan is not supported.

Make sure that the fans have the air flow that matches the model number. An air flow opposite to the system design will cause the system to operate at a higher (less than optimal) temperature. For power supply unit air flow direction, refer to Air Flow.

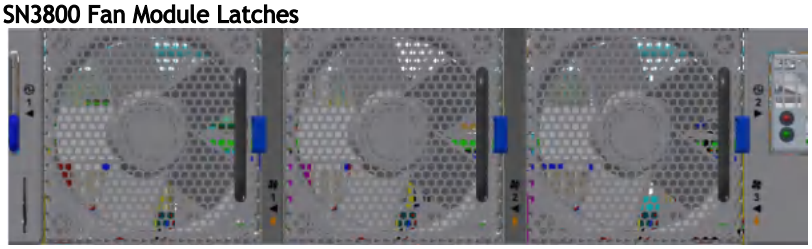
If operating the systems at full capacity with all ports occupied, and at 40°C ambient temperature, and one of the system fans becomes faulty, it is recommended to replace the fan within 24 hours of failure.

To remove a fan unit:

1. Grasping the handle with your right hand, push the latch release with your thumb while pulling the handle outward. As the fan unit unseats, the fan unit status LEDs will turn off.
2. Remove the fan unit.

SN3700/SN3700C Fan Module Latches

SN3800 Fan Module Latches



SN3420 Fan Module Latches

To insert a fan unit:

1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.
2. Insert the fan unit by sliding it into the opening until slight resistance is felt. Continue pressing the fan unit until it seats completely.

> The green Fan Status LED should light. If not, extract the fan unit and reinsert it. After two unsuccessful attempts to install the fan unit, power off the system before attempting any system debug.

SN3510 Fixed Rail Kit

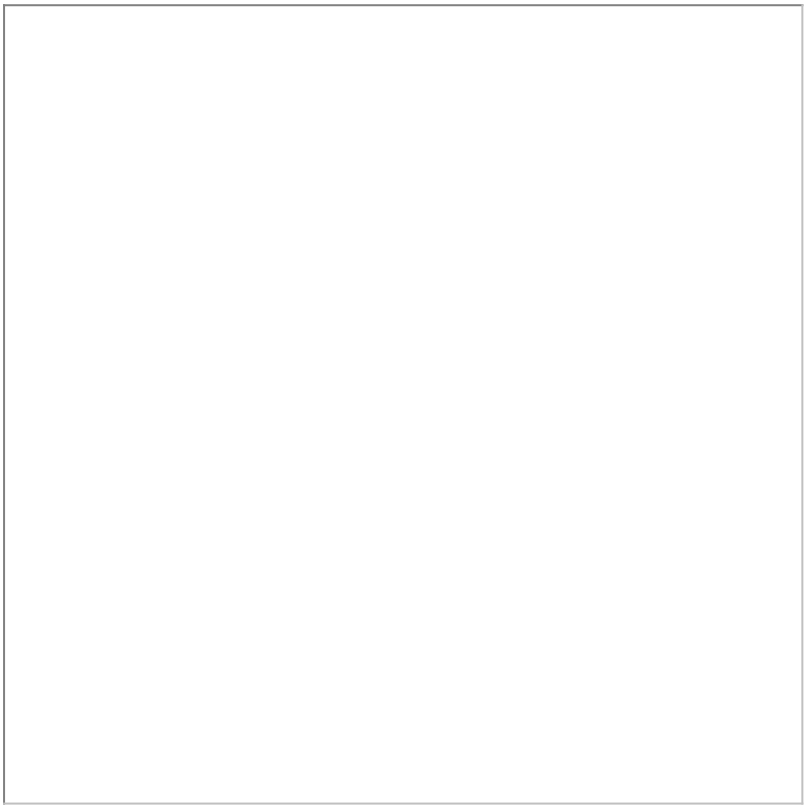
> This document is preliminary and subject to change.

Kit OPN	Rack Size and Rack Depth Range
MTEF-KIT-C	430-800 mm

The following parts are included in the fixed rail kit (see figure below):

- 2x Rack mount rails (A)
- 2x Rack mount blades (B)
- 2x Rack mount ears (C)
- 8x M6 Standard cage nuts (D)
- 8x M6 Standard pan-head Phillips screws (E)
- 4x Flat Head Phillips 100 DEG 6-32X1/4" ST.ST PATCH 360 (F)

Rack Rail Kit Parts



Prerequisites:

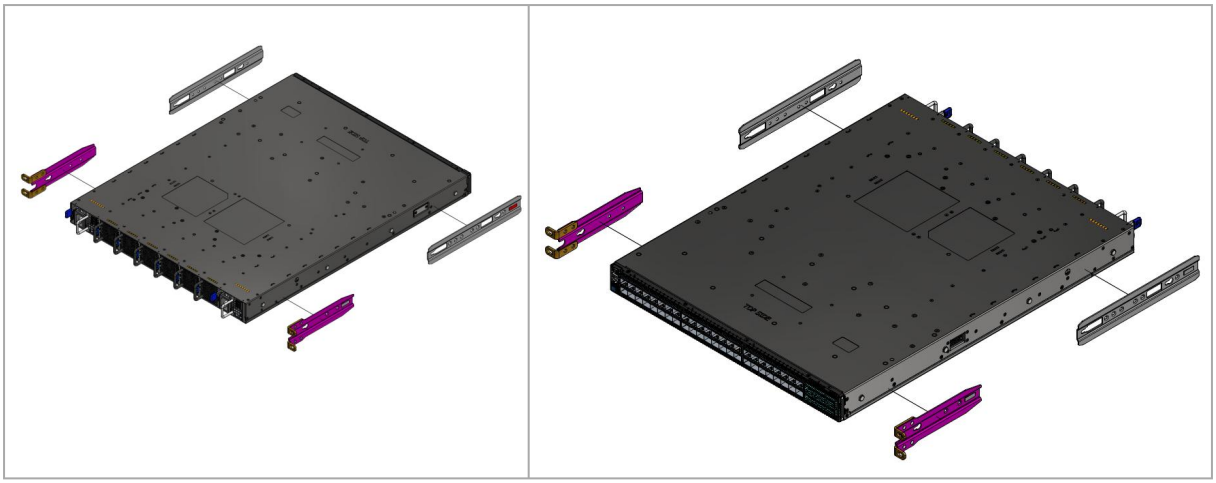
Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, consider the two installation options shown in the figures below, and review the following points:

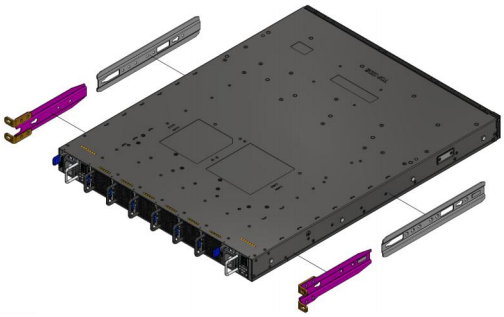
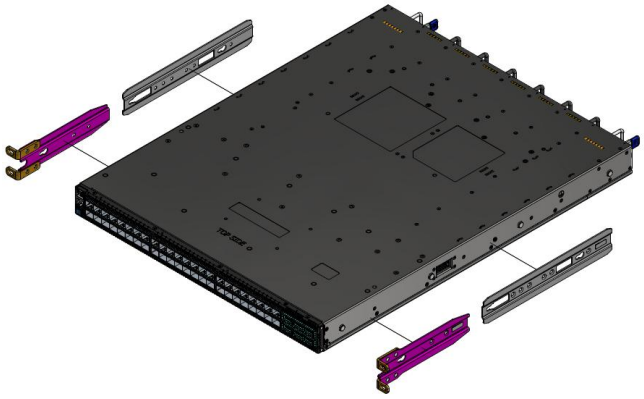
- Make sure the system air flow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.
- Note that the part of the system to which you choose to attach the rails (the front panel direction, as demonstrated in Option 1 or the FRUs direction, as demonstrated in Option 2) will determine the system's adjustable side. The system's part to which the brackets are attached will be adjacent to the cabinet.
- The FRU side is extractable. Mounting the rack brackets inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

Short Racks (430-580 mm) Installation Options

Front Side (Ports)	**Rear Side (FRUs)**



Standard Racks (580-800 mm) Installation Options

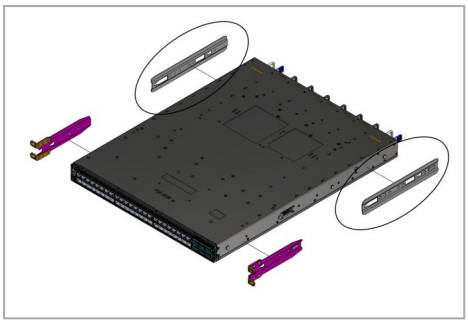
Front Side (Ports)	Rear Side (FRUs)
	

To mount the system into the rack:

> ⚠ The following steps include illustrations that show front side (ports) installation, yet all instructions apply to all installation options.

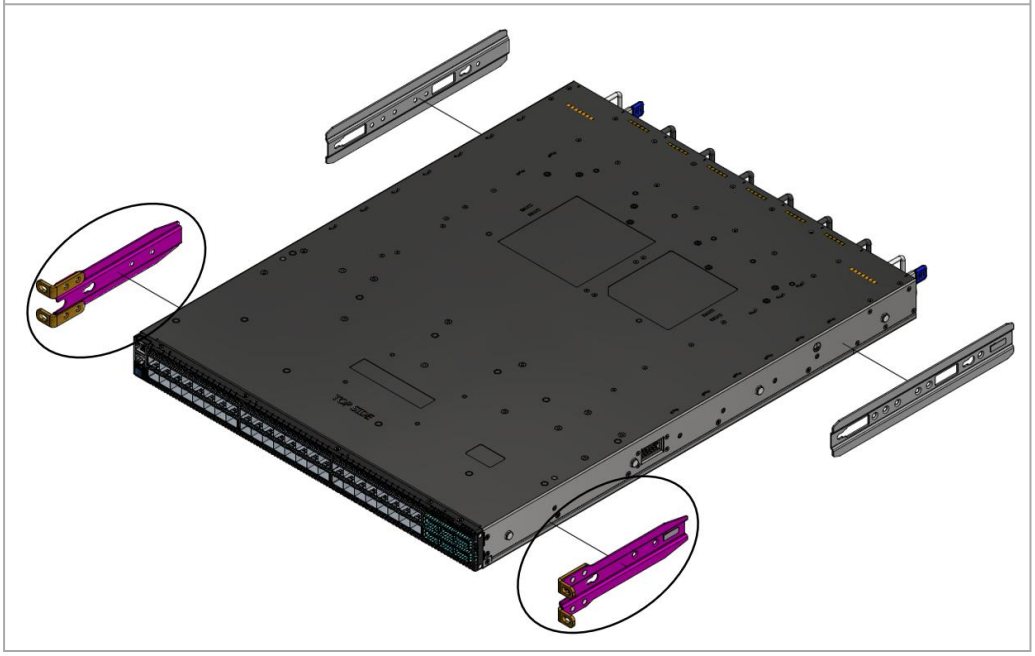
1. Attach the left and right rack mount rails (A) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs.
2. Secure the chassis in the rails by screwing 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.

Attaching the Rails to the Chassis



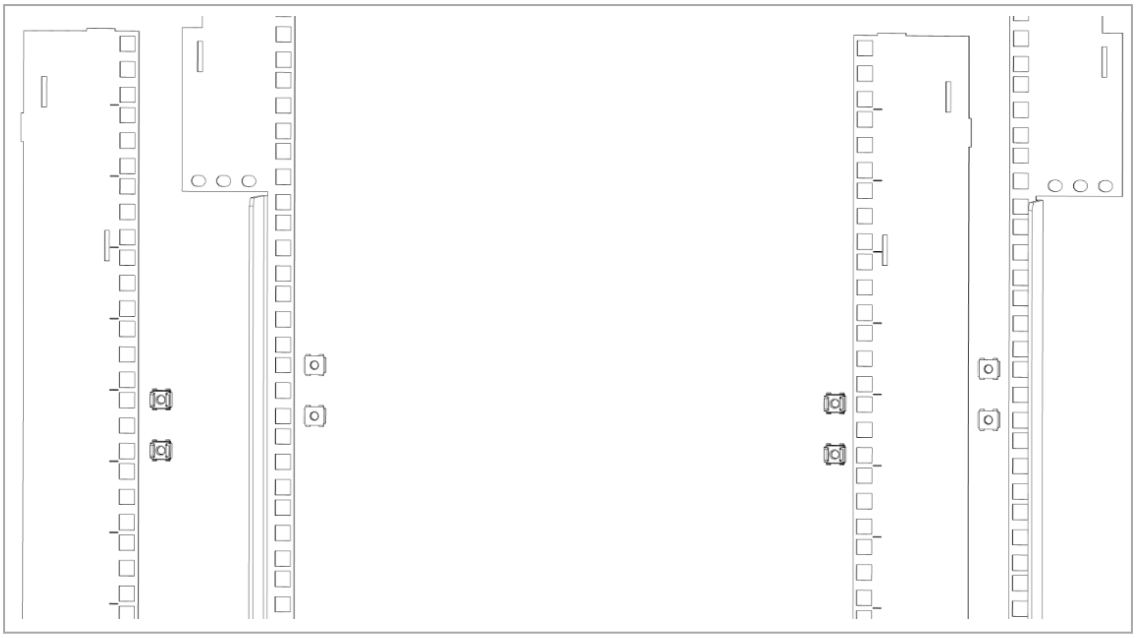
3. Attach the left and right rack mount ears (C) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs. Secure the system in the brackets by screwing the remaining 2 flat head Phillips screws (F) in the designated points with a torque of 1.5±0.2 Nm.

Attaching the Brackets to the Chassis



4. Install 8 cage nuts (D) in the desired 1U slots of the rack: 4 cage nuts in the non-extractable side and 4 cage nuts in the extractable side.

Installing the Cage Nuts

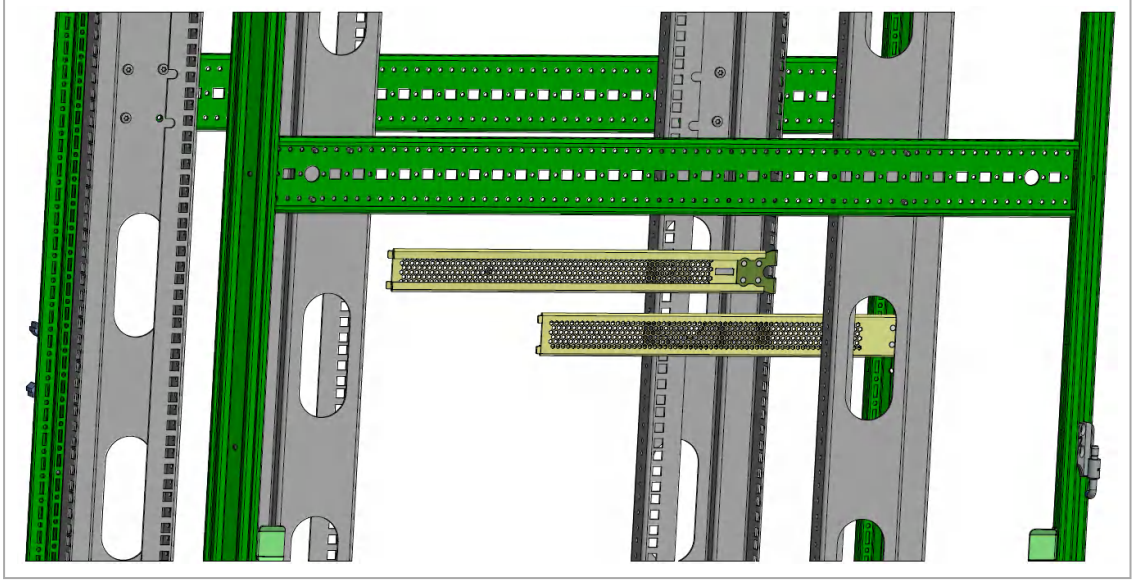


> While each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bottom holes only.

While your installation partner is supporting the system's weight, perform the following steps:

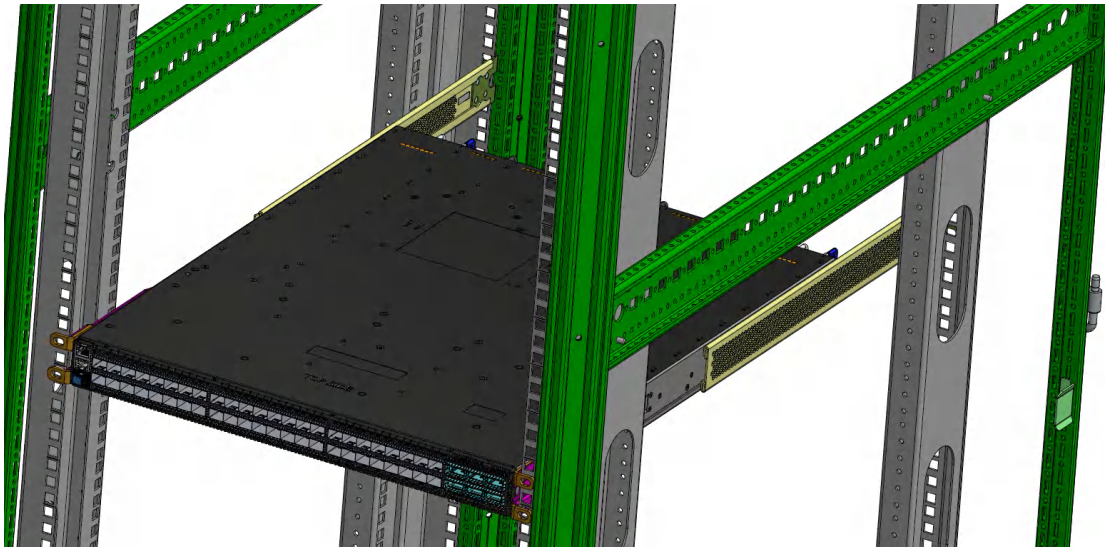
5. Attach the two rack mount blades (B) to the back side (FRU side) of the rack by inserting four M6 screws (E) in the designated cage nuts. Do not tighten the screws yet.

Attaching the Brackets to the Rack



6. Slide the switch with the rails (A) and ears (C) installed on it into the left and right rails (B) on the rack. Use four M6 screws (E) to fix the rack mount ears (C) to the rack. Do not tighten the screws yet.

Sliding the Blades in the Rails



At least two people are required to safely mount the system in the rack.

7. When fully inserted, fix the switch by tightening the 8 screws (E) inserted in Step 5 and Step 6 with a torque of 4.5±0.5.

Removing the System from the Rack

To remove a unit from the rack:

1. Turn off the system and disconnect it from peripherals and from the electrical outlet. While your installation partner is supporting the system's weight:
2. Loosen the screws attaching the rack mount ears (C) to the rack. Do not remove them yet.
3. Loosen the screws attaching the rack mount blades (B) to the rack, and pull the blades towards you, while your partner is holding the system.
4. Extract the loosened screws from Step 2 and dismount the system from the rack.
5. Remove the rails and brackets from the chassis by unscrewing 4 screws.

SN3420 Fixed Rail Kit

By default, the system is sold with the standard-depth rail kit. The short-depth rail kit can be supplied upon request.

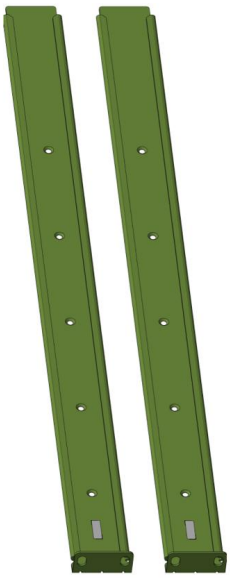
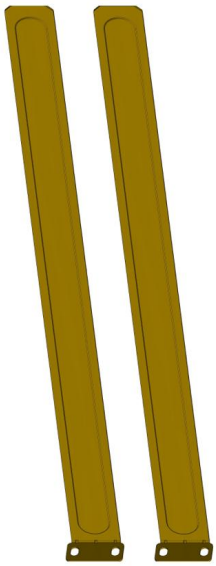
Kit Part Number	Legacy Kit Part Number	Rack Size and Rack Depth Range
930-9NRKT-00JE-000	MTEF-KIT-BP	Short: 19.7"-23.6" (50 to 60 cm)
930-9NRKT-00JV-000	MTEF-KIT-SP	Standard: 23.6"-31.5" (60 to 80 cm)

The following parts are included in the static rail kit (see figure below):

- 2x Rack mount rails (A)
- 2x Rack mount blades (B)
- 8x M6 Standard cage nuts[1] [2] and 8x M6 Standard pan-head Phillips screws[1] (C)
- 4x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screw with around patch (D).

[1] Other threads are available by special order: M5, 10-32, 12-24. [2] G-type cage-nut is available by special order.

Rack Rail Kit Parts

A	B
	
C X 8	**D X 4**
	

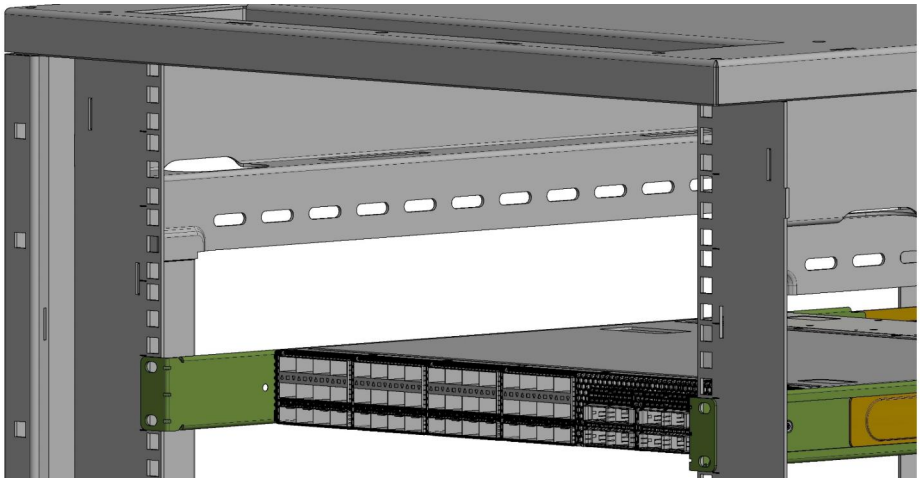
Prerequisites

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, consider the two installation options shown in the Installation Options figure below, and review the following points:

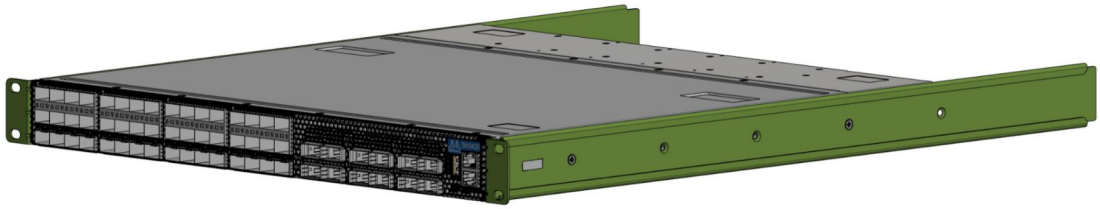
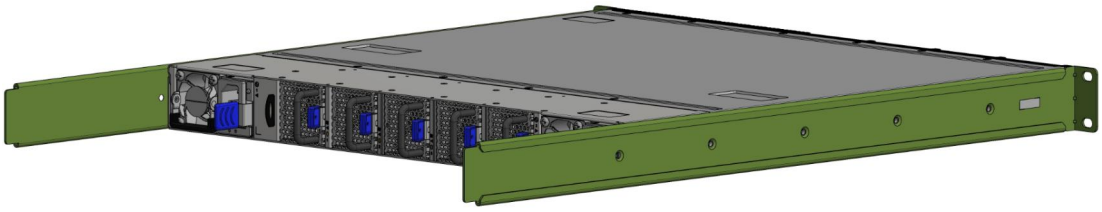
- Make sure the system air flow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.

- Note that the part of the system to which you choose to attach the rails (the front panel direction, as demonstrated in Option 1 or the FRUs direction, as demonstrated in Option 2) will determine the system's adjustable side. The system's part to which the blades are attached, will be adjacent to the cabinet.
- In case there are cables that cannot bend within the rack, or in case more space is needed for cable bending radius, it is possible to recess the connector side or the FRU side by 3.5" (8.9 cm), by optional placement of the system's rails:

Recessed Installation	Protruding Installation
	

- The FRU side is extractable. Mounting the rack blades inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

Installation Directions

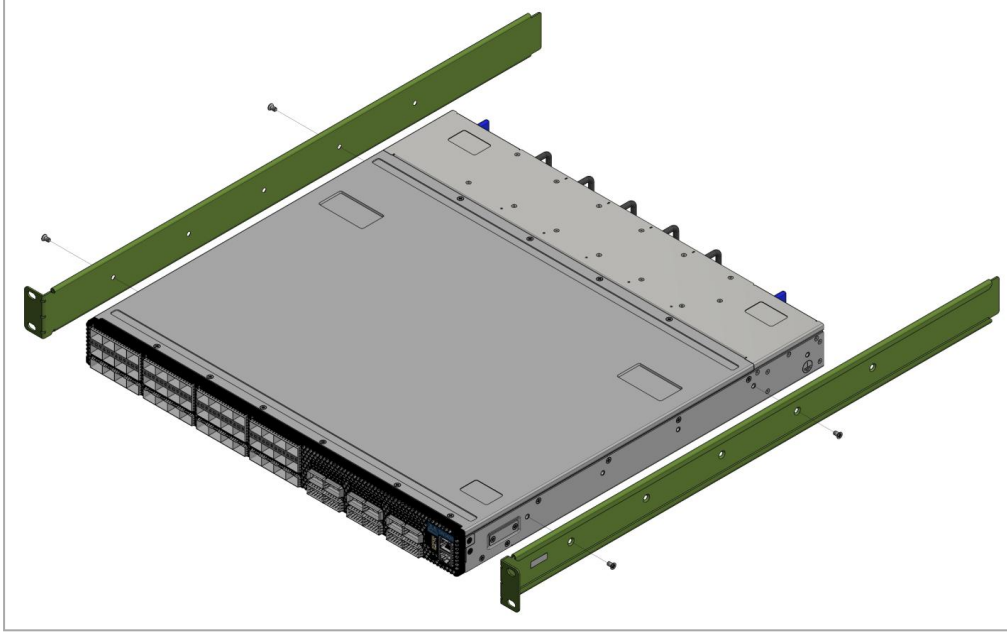
Option 1

Option 2


To mount the system into the rack:

> At least two people are required to safely mount the system in the rack.

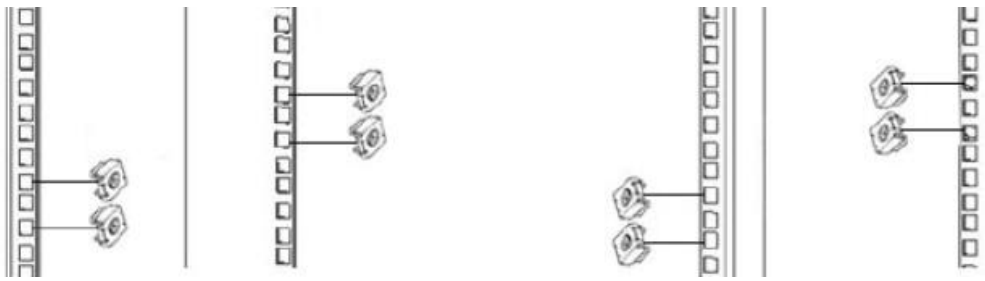
1. Attach the left and right rack mount rails (A) to the switch, and secure the chassis in the rails by screwing 2 flat head Phillips screws (D) in the designated points on each side (a total of 4 screws). To tighten the screws, use a torque of 1.5±0.2 Nm.

Attaching the Rails to the Chassis



2. Install 8 cage nuts (C) in the desired slots of the rack: 4 cage nuts in the non-extractable side and 4 cage nuts in the extractable side. Note that while each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bottom holes only.

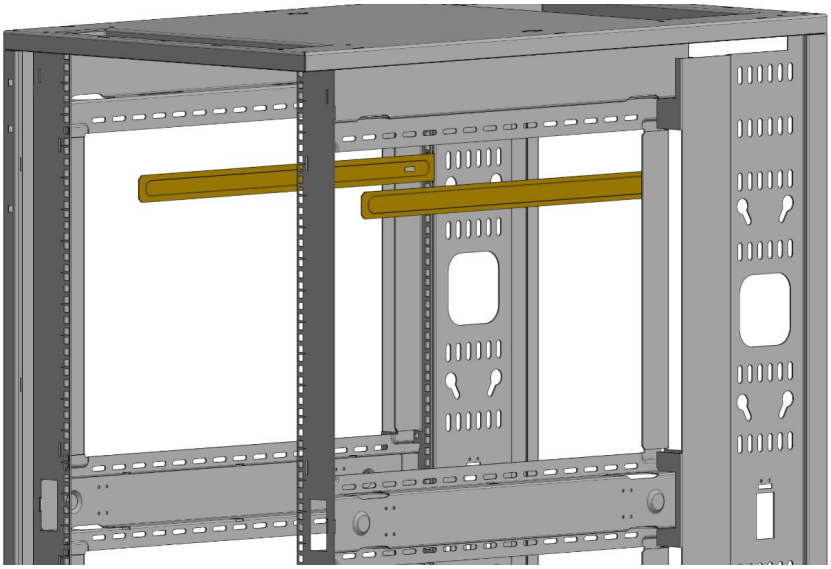
Installing the Cage Nuts



While your installation partner is supporting the system's weight, perform steps 3, 4 and 5:

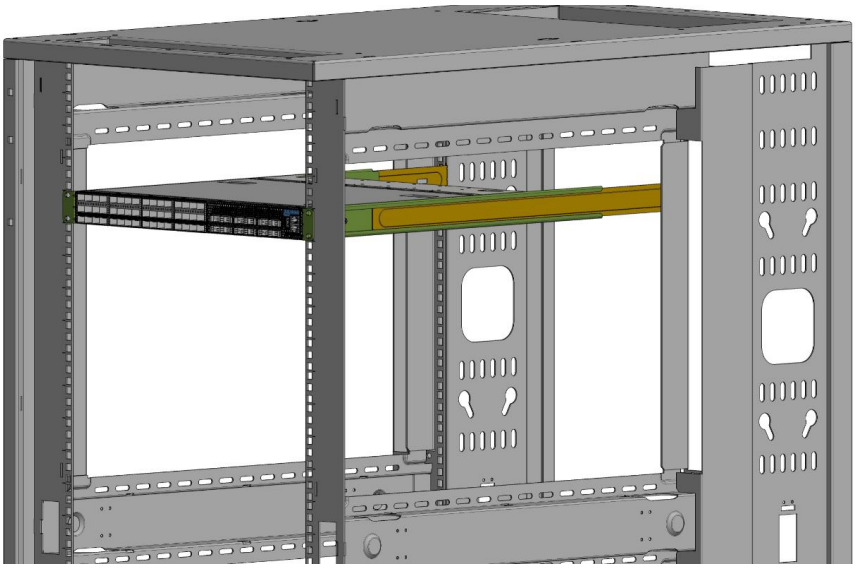
3. On the rear side of the cabinet, install the two blades (B) in the selected rack unit, using four M6 screws (C). Do not tighten the screws yet.

Attaching the Rails to the Rack



4. Slide the two blades into the left and right rails, and adjust them to fit your rack's depth. Use four M6 screws (D) to fix the blades into the rack. Do not tighten the screws yet.

Sliding the Blades in the Rails



5. Secure the system in the rack by tightening the 8 screws inserted in Step 3 and Step 4 with a torque of 4.5±0.5 Nm.

Interfaces

This document is preliminary and subject to change.

The systems support the following interfaces:

- 10/100/1000Mb Ethernet management interface (RJ45)
- USB port (uUSB connector)
- RS232 Console port (RJ45)
- RJ45 management interface(s)
- Reset button
- Status and Port LEDs

In order to review the full configuration options matrix, refer to Management Interfaces, PSUs and Fans.

Data Interfaces

The data interfaces use QSFP28/56 connectors. The full list of interfaces per system is provided in Speed and Switching Capabilities.

As detailed in the following table, for additional data interfaces, each QSFP28/56 port can be connected with a QSFP28/56 cable or connector through NVIDIA QSFP to SFP (Dynamix QSA™) adapters, hybrid or split cables*.

Model Family	Ports	Maximum Speed
SN3700C	32	100GbE
		40GbE
	64	50GbE
	128	25GbE
		10GbE
		1GbE
SN3700	32	200GbE
		40GbE
	64	100GbE
	128	50GbE
		25GbE
		10Gbe
		1GbE

Model Family	Ports	Maximum Speed
SN3800 (EoL)	64	100GbE (NRZ)
		40GbE (Contact NVIDIA)
	128	50GbE
		25GbE
		10GbE
SN3420	12	100GbE
	24	50GbE
	12	40GbE
	48+48	25GbE
		10GbE
		1GbE

*In the SN3700 systems, when interconnecting Switch to Switch and Switch to NIC in 50GbE, 100GbE and 200GbE based PAM4 speeds, the supported length of PAM4 passive copper and breakout cables is up to 2.5m. The systems offer support of up to 5W transceivers in the following switch ports:

High Power/LR4 Transceivers Support

Model Family	Ports	Maximum High Power Support
SN3700C	1, 2, 31, 32	Power class 7 (5W)
	3-30	Power class 4 (3.5W)
SN3700	1-32	Power class 7 (5W)
	1, 2, 21, 22	Power class 8 (6.5W)
SN3800	1-3, 5-7, 9-11, 13-15, 17-19, 21-23, 25-27, 29-31, 33-35, 37-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63	Power class 4 (3.5W)
	4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64	Power class 7 (5W)
SN3420	1-6	2.5W
	7-48	1.5W
	49-52, 54, 56, 58, 60	3.5W
	53, 55, 57, 59	5W

Speed

Ethernet speed must be set manually. The system's ports can be manually configured to run at speeds ranging from 1GbE/10GbE to 100GbE/200GbE/400GbE (for more details, see Specifications). To change the port speed configuration, use the command "speed" under interface configuration mode. Refer to the *NVIDIA Onyx (MLNX-OS) User Manual* for instructions on port speed re-configuration.

RS232 (Console)

The "Console" port (labeled ) is an RS232 serial port on the front side of the chassis that is used for initial configuration and debugging. Upon first installation of the system, you need to connect a PC to this interface and configure network parameters for remote connections. Refer to Configuring Network Attributes Using NVIDIA Onyx (MLNX-OS) to view the full procedure.

Management

The RJ45 Ethernet "MGT" port (labeled ) provide access for remote management. The management ports are configured with auto-negotiation capabilities by default (100MbE to 1000GbE). The management ports' network attributes (such as IP address) need to be pre-configured via the RS232 serial console port or by DHCP before use. Refer to Configuring Network Attributes Using NVIDIA Onyx (MLNX-OS) to view the full procedure.

Make sure you use only FCC compliant Ethernet cables.

USB

The SN3700/SN3800 systems' USB interface is USB 2.0 compliant, and the SN3420 systems' USB interface is USB 3.0 compliant. This interface can be used by NVIDIA Onyx software to connect to an external disk for software upgrade or file management. The connector comes in a standard micro USB shape.

To view the full matrix of the USB configuration options, refer to Management Interfaces, PSUs and Fans.

USB 1.0 is not supported.

Do not use excessive force when inserting or extracting the USB disk to and from the connector.

Reset Button

The reset button is located on the front side of the system. This reset button requires a tool to be pressed.

> Do not use a sharp pointed object such as a needle or a push pin for pressing the reset button. Use a flat object to push the reset button.

When using an NVIDIA Onyx (MLNX-OS) based system, keeping the reset button pressed for more than 15 seconds will reset the system and the “admin” password, this should allow you to login without a password and set a new password for the “admin” user.

For Cumulus Linux password reset instructions, please refer to the Single User Mode - Boot Recovery section in the *Cumulus Linux User Guide*.

Status and Port LEDs

See LED Notifications.

LED Notifications

The system’s LEDs are an important tool for hardware event notification and troubleshooting.

> In some systems, the Activity LED is positioned on the left side while the Link LED on the right. The positions of the LEDs are reversed in later system revisions.

LED Symbols

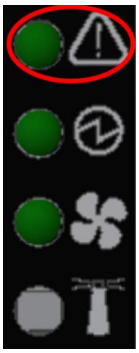
Symbol	Name	Description	Normal Conditions
	System Status LED	Shows the health of the system.	Green/Flashing green when booting
	Fan Status LED	Shows the health of the fans.	Green
	Power Supply Units LEDs	Shows the health of the power supply units.	Green

Symbol	Name	Description	Normal Conditions
	Unit Identifier LED	Lights up on command through the CLI.	Off or blue when identifying a port

System Status LED

The LED in the red oval shows the system’s status.

> The image is for illustration only. The status LEDs' order and form may slightly vary, depending on the system.



> It may take up to five minutes to turn on the system. If the System Status LED shows amber after five minutes, unplug the system and call your NVIDIA representative for assistance.

System Status LED Assignments

LED Behavior	Description	Action Required
Solid Green	The system is up and running normally.	N/A
Flashing Green	The system is booting up.	Wait up to five minutes for the end of the booting process.
Solid Amber	An error has occurred. For example, corrupted firmware, system is overheated etc..	In case the System Status LED shows amber five minutes after starting the system, refer to Troubleshooting for further instructions.

Fan Status LED

Fan Status LED - Front and Rear Sides

> The images are for illustration only. The status LEDs' order and form may slightly vary, depending on the system.

	Both of these LEDs in the red ovals show the fans’ status.	

Fan Status Front LED Assignments

LED Behavior	Description	Action Required
Solid Green	All fans are up and running.	N/A
Solid Amber	Error, one or more fans are not operating properly.	The faulty FRUs should be replaced.

Fan Status Rear LED Assignments (One LED per Fan)

LED Behavior	Description	Action Required
Solid Green	A specific fan unit is operating.	N/A
Solid Amber	A specific fan unit is missing or not operating properly.	The fan unit should be replaced.

> Risk of Electric Shock! With the fan module removed, power pins are accessible within the module cavity. Do not insert tools or body parts into the fan module cavity.

Power Supply Status LEDs

The LED in the red oval shows the power supply status.

> The images are for illustration only. The status LEDs' order and form may slightly vary, depending on the system.

Rear Side Panel

There are two power supply inlets in the system (for redundancy). The system can operate with only one power supply connected. Each power supply unit has two single color LEDs on the right side of the unit, that indicate the status of the unit.

The primary power supply (PS) unit is located on the left side, and the secondary unit is located on the right side.

Power Supply Unit Status Front LED Assignments

LED Behavior	Description	Action Required
Solid Green	All power supply units are connected and running normally.	N/A
Solid Amber	One or both of the power supplies are not operational or not powered up/ the power cord is disconnected.	Make sure the power cord is plugged in and active. If the problem resumes, refer to Troubleshooting for further instructions.

Power Supply Unit Status Rear LED Assignments

LED Behavior	Description	Action Required
Solid Green	The PSU is running normally.	N/A
Flashing Green 1Hz	AC Present / 5VSB on (PSU is off).	Refer to Troubleshooting. For further assistance, call your NVIDIA representative.
Flashing Red/ Amber 1Hz	PSU warning - events where the PSU continues to operate.	
Solid Red/ Amber	PSU failure (voltage, current, temperature or fan related issue).	
	AC cord unplugged or AC power loss in one PSU while the other PSU has AC input.	Plug in the AC cord for the faulty PSU.

LED Behavior	Description	Action Required
Off	No AC power to all power supplies.	Plug in the AC cord.

Unit Identification LED

The UID LED is a debug feature, that the user can use to find a particular system within a cluster by turning on the UID blue LED.

To activate the UID LED on a switch system, run:

```
switch (config) # led MGMT uid on
```

To verify the LED status, run:

```
switch (config) # show leds
Module LED Status
------------------------------------------------------------------------
MGMT UID Blues
```

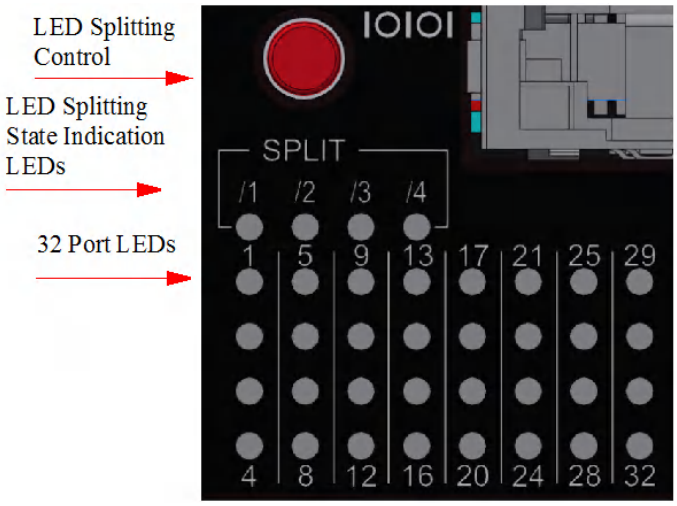
To deactivate the UID LED on a switch system, run:

```
switch (config) # led MGMT uid off
```

Port LEDs

SN3700/SN3700C Port LEDs

Each QSFP module can be used as one 4X port/two 2X ports/four 1X ports. Each QSFP has one dedicated bi-color LED. In order to provide link information for more than one port by using one LED, LED splitting control button is available. You may use the button to select between 5 indication states. By pressing on the button, the next indication state will be selected in a cyclic manner. The current state can be identified by the LED splitting state indication LEDs. The states and their indications are detailed in the below table.



SN3700/SN3700C LED Splitting Options

State	State Indication LEDs [/1 /2 /3 /4]	QSFP Module LED Indication	Comments
0		Indication for all link types, as described in Port LEDs Indications (State 0)	See details in Port LEDs Indications (State 0)
1		LED indication for the following link types: 4X/2XA/1XA	• See details in Port LEDs Indications (States 1-4). • Only one of the link types can be up at a given time.
2		LED indication for the following link types: 4X/2XB/1XB	
3		LED indication for the following link types: 4X/1XC	
4		LED indication for the following link types: 4X/1XD	

The port LED behavior indicates the port state, as follows:

SN3700/SN3700C Port LEDs Indications

State	LED Behavior	Description	Action Required
0	Off	No 4X/2X/1X link was established on this QSFP module	N/A
	Solid Green	At list one link was established: 4X/ 2XA /2XB/1XA / 1XB/1XC/1XD	

State	LED Behavior	Description	Action Required
	Flashing Green	Traffic is running in linked ports	
	Flashing Amber	N/A	
1-4	Off	Link is down	
	Solid Green	Link is up with no traffic	
	Flashing Green	Link is up with traffic	
	Flashing Amber	A problem with the link	Refer to Troubleshooting.

SN3800 and SN3420 Port LEDs

SN3800:

SN3420:

SN3420 LED Splitting Options

In the SN3420 systems, the state of the splittable ports (49-60) is indicated by the port LEDs in the following manner:

State	State Indication LEDs	QSFP Module LED Indication
1		LED indication for 4X QSFP link
2		LED indication for 2X QSFP link
3		LED indication for 1X QSFP link

SN3800 and SN3420 Port LED Indications

LED Behavior	Description	Action Required
Off	Link is down	Refer to Troubleshooting.
Solid Green	Link is up with no traffic	N/A
Flashing Green	Link is up with traffic	N/A
Flashing Amber	A problem with the link	Refer to Troubleshooting.

Inventory Information

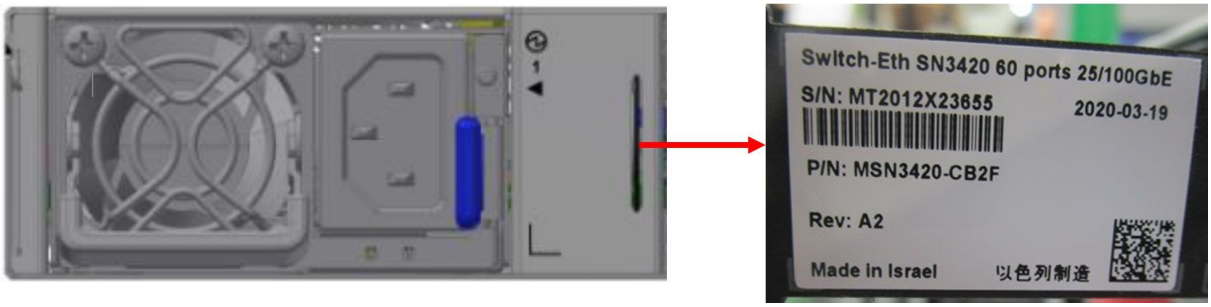
The system's inventory parameters (such as serial number, part number and GUID address) can be extracted from the inventory pull-out tab on the lower left side of the rear panel.

Pull-out Tab

SN3700/SN3700C:

SN3800:

SN3420:



Software Management

This document is preliminary and subject to change.

The system includes an embedded management CPU card that runs NVIDIA Onyx® (MLNX-OS®) management software. This system includes a CLI, WebUI, SNMP, system management software, Ethernet protocols and IB management software (OpenSM).

- For NVIDIA Onyx (MLNX-OS) systems management package and related documentation, visit the product page at https://docs.nvidia.com/networking/category/onyx.
- For Cumulus® Linux® software management instructions, refer to the *Cumulus Linux User Guide*.

The Ethernet ports for remote management connect to Ethernet systems. These systems must be configured to 100Mb/1Gb auto-negotiation.

No more than two subnet managers are recommended for any single fabric.

Software Upgrade

NVIDIA Onyx (MLNX-OS) Software Upgrade

Software and firmware updates are available from the NVIDIA Support website. Check that your current revision is the latest one available on the NVIDIA Support website. If you do not have the latest revision, upgrade your software using the CLI or the GUI. Copy the updated software to a known location on a remote server within the user's LAN.

For further information please refer to the NVIDIA Onyx (MLNX-OS) Software User Manual in the "Upgrading Onyx (MLNX-OS) Software" section.

Prior to updating, read and follow all of the instructions regarding the updating of the software on your system.

Switch Firmware Update

The systems do not require firmware updating. Firmware updating is done through the NVIDIA Onyx (MLNX-OS) management software.

Cumulus Linux Software Upgrade

For Cumulus Linux software upgrade instructions, see Upgrading Cumulus Linux in the Cumulus Linux User Guide.

Troubleshooting

This document is preliminary and subject to change.

Problem Indicator	Symptoms	Cause and Solution
LEDs	System Status LED is blinking for more than 5 minutes	Cause: NVIDIA Onyx (MLNX-OS) software did not boot properly and only firmware is running. Solution: Connect to the system via the console port, and check the software status. You might need to contact an FAE if the NVIDIA Onyx (MLNX-OS) software did not load properly.
	System Status LED is amber	Cause: • Critical system fault (CPU error, bad firmware) • Over temperature Solution: • Check environmental conditions (room temperature)
	Fan Status LED is amber	Cause: Possible fan issue Solution: • Check that the fan is fully inserted and nothing blocks the airflow • Replace the fan FRU if needed
	PSU Status LED is red	Cause: Possible PSU issue Solution: • Check/replace the power cable • Replace the PSU if needed

System boot failure while using NVIDIA Onyx (MLNX-OS)	Software upgrade failed on x86 based systems	Solution:
		• Connect the RS232 connector (CONSOLE) to a laptop.
		• Push the system's reset button.
		• Press the ArrowUp or ArrowDown key during the system boot. GRUB menu will appear. For example:
		
		`Default image: 'SX_X86_64 SX_3.4.0008 2014-11-10 20:07:51 x86_64'`
		`Press enter to boot this image, or any other key for boot menu`
		`Booting default image in 3 seconds.`
		`Boot Menu`
		`----------`
		`-`
		`0: SX_X86_64 SX_3.4.0008 2014-11-10 20:07:51 x86_64`
		`1: SX_X86_64 SX_3.4.0007 2014-10-23 17:27:34 x86_64`
		`----------`
		`-`
		`Use the ArrowUp and Arrowdown keys to select which entry is highlighted.`
		`Press enter to boot the selected image or 'p' to enter a password to unlock the next set of features.`
		`Highlighted entry is 0:`
		`"`
		
		• Select previous image to boot by pressing an arrow key and choosing the appropriate image.

Problem Indicator	Symptoms	Cause and Solution
System boot failure while using Cumulus Linux	Software upgrade failed on x86 based systems	See Monitoring and Troubleshooting in *Cumulus Linux User Guide*.
System reset failure in SN3420	When the front panel reset button is pressed, the system does not respond. It either stalls, or continues operating with no reset.	Cause: The reset button is stuck in a pressed position due to physical pressure applied by the front panel. Solution: The suitable solution depends on the reset reason: 1. For regular system reset, select one of the following commands (according to your Operating System), and run it from the CLI: DVS OS: `reboot` Sonic: `reboot` Onyx: `reload` Cumulus: `sudo reboot` 2. In case a reset is required in order to quit a sleep mode that was activated using the `halt`, `poweroff` or `shutdown` commands, the system should be power cycled using the `PDU OFF/ON` command. 3. If password reset is required, please contact NVIDIA's support team at Networking-support@nvidia.com.

Specifications

This document is preliminary and subject to change.

SN3700/SN3700C Specifications

Feature		Value
Mechanical	Size:	1.72” (H) x 16.84” (W) x22” (D), 44mm (H) x 428mm (W) x 559mm (D)
	Mounting:	19” Rack mount
	Weight:	1 PSU: 11.4kg, 2 PSUs: 12.488kg
	Speed:	10/25/40/50/100/200GbE per port
	Connector cage:	SN3700 (200GbE Models) - 32 QSFP56 SN3700C (100GbE Models) - 32 QSFP28
Environmental	Temperature:	Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude:	3050m
	Noise level:	Contact NVIDIA for more information
Regulatory	Safety/ EMC:	CB, cTUVus, CE, CU, S_Mark, CE, FCC, VCCI, ICES, RCM, BSMI, KCC, CCC
	RoHS:	RoHS compliant
Power	Input Voltage:	1x/2x, 100-127VAC; 50/60Hz 10A; 200-240 50/60Hz 6A/ 192-288VDC (not certified)
	Global Power Consumption:	Global Power Consumption: SN3700 (200GbE Models) - 250W SN3700C (100GbE Models) - 242W
Main Devices	CPU:	SN3700 (200GbE Models) - Intel x86 2.20GHz Quad Core SN3700C (100GbE Models) - Intel x86 2.20GHz Dual Core
	PCIe:	4x Gen 3.0
	Switch:	NVIDIA Spectrum®-2
	Memory:	8GB DDR4 RAM, 32G SSD
Throughput		SN3700 - 12.8Tb/s SN3700C - 6.4Tb/s

SN3800 Specifications (EoL)

Feature		Value
Mechanical	Size:	3.46” (H) x 16.84” (W) x22” (D) 88mm (H) x 428mm (W) x 559mm (D)
	Mounting:	19” Rack mount
	Weight:	1 PSU: 16.7kg, 2 PSUs: 17.788kg
	Speed:	10/25/50/100GbE per port (for 40GbE please contact NVIDIA Sales)
	Connector cage:	64 QSFP28
Environmental	Temperature:	Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude:	3050m
	Noise level:	Contact NVIDIA for more information
Regulatory	Safety/ EMC:	CB, cTUVus, CE, CU, S_Mark, CE, FCC, VCCI, ICES, RCM, BSMI, KCC, CCC
	RoHS:	RoHS compliant
Power	Input Voltage:	1x/2x, 100-127VAC; 50/60Hz 10A; 200-240 50/60Hz 6A/ 192-288VDC (not certified)
	Global Power Consumption:	Typical power with passive cables (ATIS):631W
Main Devices	CPU:	Intel x86 2.20GHz Quad Core
	PCIe:	4x Gen 3.0
	Switch:	NVIDIA Spectrum®-2
	Memory:	8GB DDR4 RAM, 32G SSD
Throughput		12.8Tb/s

SN3420 Specifications

Feature		Value
Mechanical	Size:	1.72’’ (H) x17.24’’ (W) x 18.29’’ (D) 44mm (H) x 438mm (W) x 464.6mm (D)
	Mounting:	19” Rack mount

Feature		Value
	Weight:	8.500Kg
	Speed:	48 x10/25GbE 12 x 100GbE
	Connector cage:	48SFP28 + 12 QSFP28
Environmental	Temperature:	Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude:	3050m
	Noise level:	Contact NVIDIA for more information
Regulatory	Safety/ EMC:	CB, cTUVus, CE, CU, S_Mark, CE, FCC, VCCI, ICES, RCM, BSMI, KCC, CCC
	RoHS:	RoHS compliant
Power	Input Voltage:	1x/2x, 100-127VAC 50-60Hz 6A; 200-240 50-60Hz 3A
	Global Power Consumption:	Typical power with passive cables (ATIS): 202W
Main Devices	CPU:	Intel x86 D-1508 2.20GHz Dual Core
	PCIe:	4X Gen 2
	Switch:	NVIDIA Spectrum®-2
	Memory:	8GB RAM, 30GB SSD
Throughput		4.8Tb/s

Appendixes

This document is preliminary and subject to change.

The document contains the following appendixes:

Accessory and Replacement Parts

Ordering Part Numbers for Replacement Parts

Part Type	Part Number	Legacy Part Number	Description	Supported Systems
Rack Installation Kits	930-9NRKT-00JN-000	MTEF-KIT-J	NVIDIA 19" racks fixed mounting-kit, Standard-depth, Rack size 600-800mm	SN3700/SN3700C, SN3800
	930-9BRKT-00JJ-000	MTEF-KIT-F	Rack installation kit for 200G 1U systems to be mounted into short/ standard depth racks	SN3700/SN3700C, SN3800
	930-9NRKT-00JE-000	MTEF-KIT-BP	NVIDIA 19” racks fixed mounting-kit, for SN2410, SN3420 systems, Short-depth, Rack size 500-600mm	SN3420
	930-9NRKT-00JV-000	MTEF-KIT-SP	NVIDIA 19” racks fixed mounting-kit, for SN2410, SN3420 systems, Short-depth, Rack size 600-800mm	SN3420
Power Supply Units	930-9NPSU-00J1-000	MTEF-PSF-AC-E	Power-Supply Unit, 550W AC, P2C Airflow, Power cord included	SN3420
	930-9NPSU-00JI-000	MTEF-PSR-AC-E	Power-Supply Unit, 550W AC, C2P Airflow, Power cord included	SN3420
	930-9BPSU-00JZ-000	MTEF-PSF-AC-C	Power-Supply Unit, 1100W AC, P2C Airflow, Power cord included	SN3700/SN3700C, SN3800
	930-9BPSU-00JG-000	MTEF-PSR-AC-C	Power-Supply Unit, 1100W AC, C2P Airflow, Power cord included	SN3700/SN3700C, SN3800
Fan Modules	930-9BFAN-00IN-000	MTEF-FANF-C	200G 1U systems FAN MODULE W/ P2C air flow	SN3700/ SN3700C, SN3420
	930-9BFAN-00J0-000	MTEF-FANR-C	200G 1U systems FAN MODULE W/ C2P air flow	SN3700/ SN3700C, SN3420

Part Type	Part Number	Legacy Part Number	Description	Supported Systems
	930-9NFAN-00IR-000	MTEF-FANF-F	2U systems FAN MODULE W/ P2C air flow	SN3800
	930-9NFAN-00J5-000	MTEF-FANR-F	2U systems FAN MODULE W/ C2P air flow	SN3800
Cables and Harnesses	HAR000631	N/A	RS232 Cable - DB9 to RJ45 2M harness 2M for SX67X0 and SB78X0	SN3700/SN3700C, SN3800, SN3420
	ACC001310	N/A	Power cord black 250v 10a 1830mm c14 to c13 - Master power cord	SN3700/SN3700C, SN3800, SN3420

Thermal Threshold Definitions

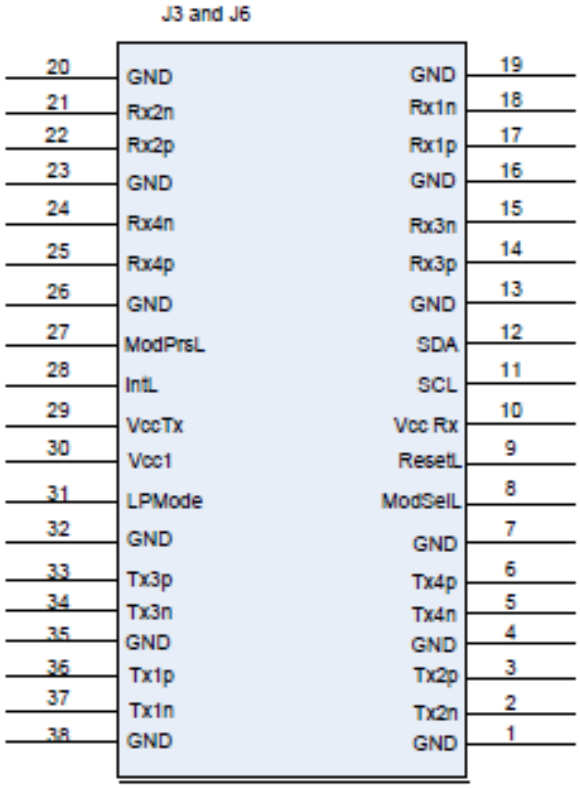
Three thermal threshold definitions are measured by the Spectrum ASICs, and impact the overall switch system operation state as follows:

- Warning – 105°C: On managed systems only: When the ASIC device crosses the 100°C threshold, a Warning Threshold message will be issued by the management software, indicating to system administration that the ASIC has crossed the Warning threshold. Note that this temperature threshold does not require nor lead to any action by hardware (such as switch shutdown).
- Critical – 120°C: When the ASIC device crosses this temperature, the switch firmware will automatically shut down the device.
- Emergency – 130°C: In case the firmware fails to shut down the ASIC device upon crossing its Critical threshold, the device will auto-shutdown upon crossing the Emergency (130°C) threshold.

For thermal threshold definitions in Cumulus Linux, see Configuring Net-SNMP Event Notification Traps in the Cumulus Networks Help Center.

Interface Specifications

QSFP28 Pin Description



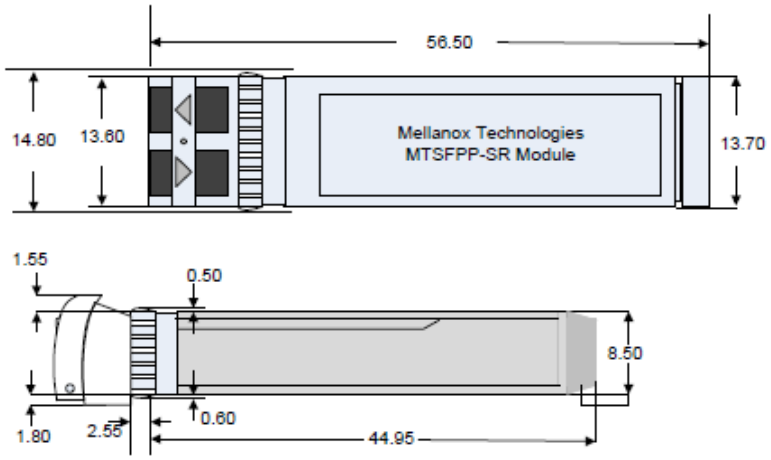
QSFP28 Pin Description

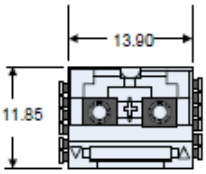
Connector Pin Number	Symbol	Signal Description
1	GND	Ground
2	Tx2n	Connected to Port 2 lane Rx Inverted Data
3	Tx2p	Connected to Port 2 lane Rx Non-Inverted Data
4	GND	Ground
5	Tx4n	Connected to Port 4 lane Rx Inverted Data
6	Tx4p	Connected to Port 4 lane Rx Non-Inverted Data
7	GND	Ground
8	Mod-SelL	Cable/Module Select
9	ResetL	Cable/Module Reset

Connector Pin Number	Symbol	Signal Description
10	Vcc Rx	+3.3 V Power supply receiver
11	SCL	2-wire serial interface clock
12	SDA	2-wire serial interface data
13	GND	Ground
14	Rx3p	Connected to Port 3 lane Tx Non-Inverted Data
15	Rx3n	Connected to Port 3 lane Tx Inverted Data
16	GND	Ground
17	Rx1p	Connected to Port 1 lane Tx Non-Inverted Data
18	Rx1n	Connected to Port 1 lane Tx Inverted Data
19	GND	Ground
20	GND	Ground
21	Rx2n	Connected to Port 2 lane Tx Inverted Data
22	Rx2p	Connected to Port 2 lane Tx Non-Inverted Data
23	GND	Ground
24	Rx4n	Connected to Port 4 lane Tx Inverted Data
25	Rx4p	Connected to Port 4 lane Tx Non-Inverted Data
26	GND	Ground
27	ModPrsL	Module/cable Present
28	IntL	Interrupt
29	Vcc Tx	+3.3 V Power supply transmitter
30	Vcc 1	+3.3 V Power Supply
31	LPMode	Low Power Mode
32	GND	Ground
33	Tx3p	Connected to Port 3 lane Rx Non-Inverted Data
34	Tx3n	Connected to Port 3 lane Rx Inverted Data
35	GND	Ground
36	Tx1p	Connected to Port 1 lane Rx Non-Inverted Data
37	Tx1n	Connected to Port 1 lane Rx Inverted Data
38	GND	Ground

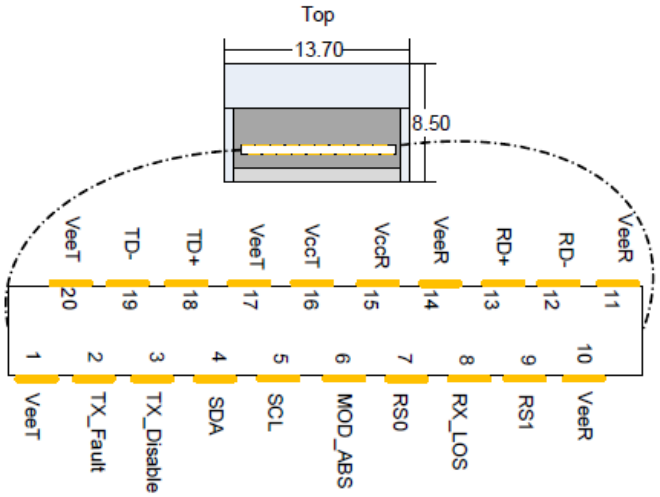
Adapter Dimensions

SFP28

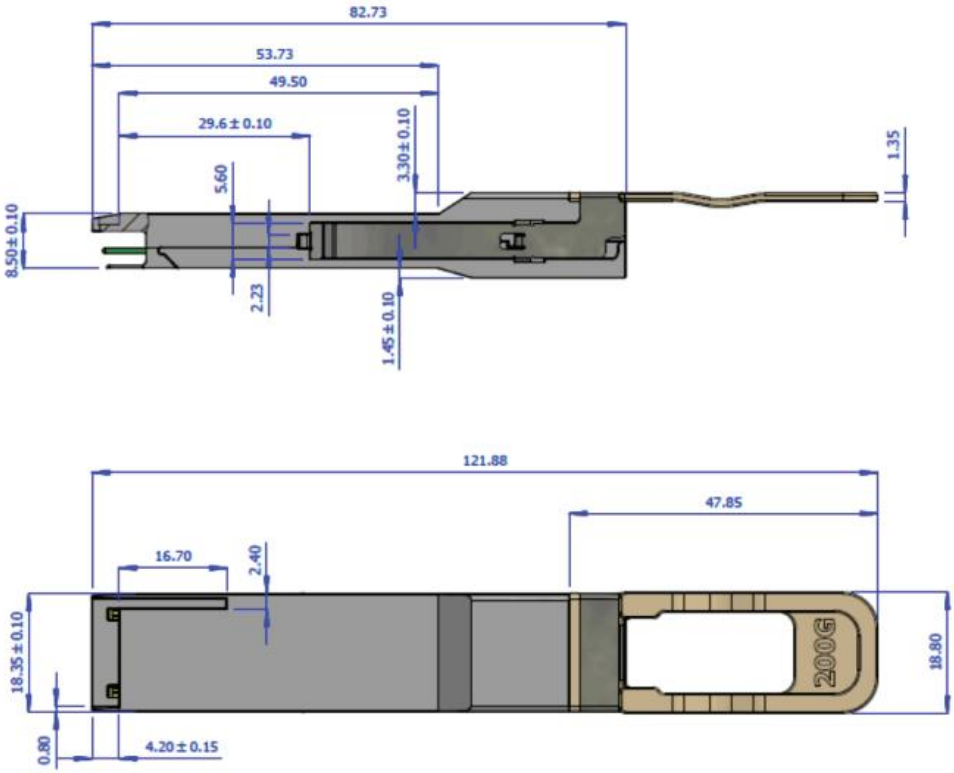




Rear View of Module with Pin Placement



SFP56



SFP Pin Description

Pin	Symbol Name	Description	Note
1	VeeT	Module Transmitter Ground	--
2	TX_Fault	Module Transmitter Fault	a
3	TX_Disable	Transmitter Disable. Turns off transmitter laser output	b
4	SDA	2-wire Serial Interface Data Line	c
5	SCL	2-wire Serial Interface Clock Line	d
6	MOD_ABS	Module Absent. Grounded within the module	d
7	RS0	No connection required	--
8	Rx_LOS	Loss of Signal indication. Logic 0 indicates normal operation.	d
9	RS1	No connection required	--
10	VeeR	Receiver Ground (Common with Transmitter Ground)	a
11	VeeR	Receiver Ground (Common with Transmitter Ground)	a
12	RD-	Receiver Inverted DATA out. AC Coupled	--

Pin	Symbol Name	Description	Note
13	RD+	Receiver Non-inverted DATA out. AC Coupled	--
14	VeeR	Receiver Ground (Common with Transmitter Ground)	a
15	VccR	Receiver Power Supply	--
16	VccT	Transmitter Power Supply	--
17	VeeT	Transmitter Ground (Common with Receiver Ground)	a
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled	--
19	TD-	Transmitter Inverted DATA in. AC Coupled	--
20	VeeT	Transmitter Ground (Common with Receiver Ground)	a

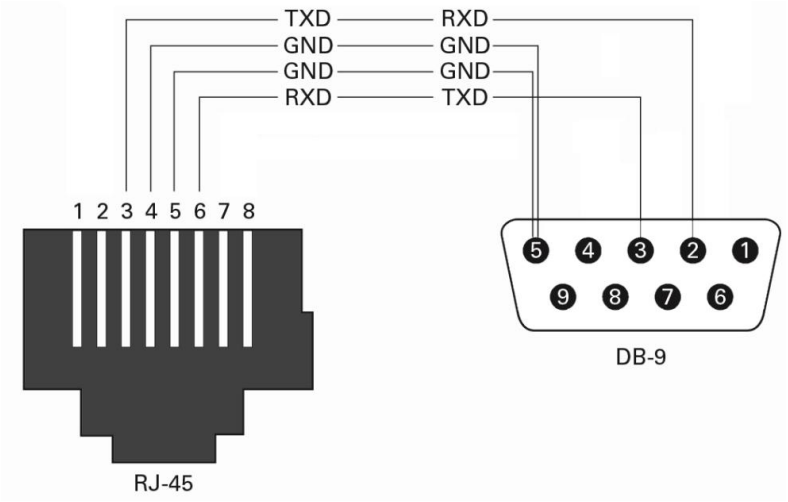
⚠

1. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k-10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V
3. Should be pulled up with 4.7kΩ-10kΩ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7kΩ-10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

RJ45 to DB9 Harness Pinout

The RS232 harness cable (DB9 to RJ45) is supplied with the switch to connect a host PC to the Console RJ45 port of the system.

RJ45 to DB9 Harness Pinout



Disassembly and Disposal

Disassembly Procedure

To disassemble the system from the rack:

1. Unplug and remove all connectors.
2. Unplug all power cords.
3. Remove the ground wire.
4. Unscrew the center bolts from the side of the system with the bracket.

   > Support the weight of the system when you remove the screws so that the system does not fall.

5. Slide the system from the rack.
6. Remove the rail slides from the rack.
7. Remove the caged nuts.

Disposal

According to the WEEE Directive 2002/96/EC, all waste electrical and electronic equipment (EEE) should be collected separately and not disposed of with regular household waste. Dispose of this product and all of its parts in a responsible and environmentally friendly way.

Follow the instructions found at http://www.mellanox.com/page/dismantling_procedures for proper disassembly and disposal of the switch, according to the WEEE directive.

Document Revision History

Date	Revision	Description
July 24, 2022	2.3	Updated OPNs in: • Ordering Information • Installation • Accessory and Replacement Parts Updated Interface Specifications
February 3, 2022	2.2	Updated: • Interfaces • Specifications
October 19, 2021	2.1	Updated: • Interfaces • SN3700/SN3700C Fixed Rail Kit • Accessory and Replacement Parts
March 1, 2021	2.0	Updated: • Accessory and Replacement Parts • Cable Installation • Troubleshooting • Specifications
November 29, 2020	1.9	Updated the High Power/LR4 Transceivers Support of SN3700C in Interfaces.
August 9, 2020	1.8	Updated SN3700 Specifications.
July 6, 2020	1.7	Added Model SN3420.
March 12, 2020	1.6	Updated rail kit figures on SN3800 Fixed Rail Kit.
March 4, 2020	1.5	Updated Cable Installation chapter - Added a link to the Mellanox Cable Management Guidelines and FAQ.
January 19, 2020	1.4	Updated: • Installation chapter, Added "100A DC Disconnect Switch Requirement" • Introduction chapter, Speed and Switching Capabilities table • Interfaces chapter, Data Interfaces table • Specifications chapter, SN3700/SN3700C/SN3800 tables • Interface Specifications chapter
January 15, 2020	1.3	Updated Cable Installation chapter, section SN3700/C Splitting Options.
December 18, 2019	1.2	Added notes to the "FRU Replacements" and "LED Notifications" chapters. Added DC Disconnect Requirement to the "Installation" chapter.
October 29, 2019	1.1	Updated rail kit figures on "SN3800 Fixed Rail Kit".
October 01, 2019	1.0	First release

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