



NVIDIA Spectrum-6 SN6000 Ethernet Switch Systems Hardware User Manual

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1 About this Manual

This manual is relevant for the following models: SN6600-LD, SN6600, SN6810-LD and SN6800-LD. It describes the installation and basic use of NVIDIA Ethernet switches based on the NVIDIA Spectrum-6 ASIC. Its intended audience is IT managers and system administrators. Refer to [Ordering Information](#) for product descriptions and part numbers.

2 Related Documentation

- [Cumulus Linux User Guide](#) and [Training Course](#)
- SONiC User Manual and release notes: log in to the NVIDIA Enterprise Support Portal → Downloads → Switches and Gateways → Switch Software → SONiC → Documentation
- [Open Network Install Environment \(ONIE\) Quick Start Guide](#)
- [NetQ User Guide](#)
- [NVIDIA Air User Guide](#)

For assistance, contact nbu-services-sales@nvidia.com

3 Revision History

A list of the changes made to this document can be found in the [Document Revision History](#).

4 Ordering Information

Pay special attention to [air flow direction](#) when ordering your system.

4.1 SN6600-LD Part Numbers

NVIDIA SKU	Product Description
920-9N62F-0 OLI-GC1	NVIDIA Spectrum-6 based 800GbE Ethernet switch with Cumulus Linux Authentication, 64 OSFP, 1 QSFP112, 48VDC Busbar, 8-Cores CPU, Secure-boot, Liquid-Cooling, Rail-Kit.

4.2 SN6600 Part Numbers

NVIDIA SKU	Product Description
920-9N63F-0 ORI-3C0	NVIDIA Spectrum-6 based 800GbE Ethernet switch with Cumulus Linux Authentication, 64 OSFP, 1 QSFP112 and 2 SFP28, 4 AC Power-Supplies, 8-Cores CPU, Secure-boot, Connector-to-Power Airflow, Rail-Kit.

4.3 SN6810-LD Part Numbers

NVIDIA SKU	Product Description
920-9N64K-0 00LI-GC0	NVIDIA Spectrum-6 based 800G Ethernet switch with Cumulus Linux Authentication, Co-Packaged Optics, 128 MMC-16, Single QSFP112, 8-Cores CPU, Secure-boot, 48VDC Busbar, Liquid-Cooling, Rail-Kit.

4.4 SN6800-LD Part Numbers

NVIDIA SKU	Product Description
920-9N67K-0 OLA-GC0	NVIDIA Quad Spectrum-6, Multi-ASIC Ethernet switch with Cumulus Linux Authentication, Co-Packaged Optics, 512 MMC-16, 4 QSFP112, 64 ELS, 16-Cores CPU, Secure-boot, 48VDC Busbar, Liquid-Cooling, Rail-Kit.

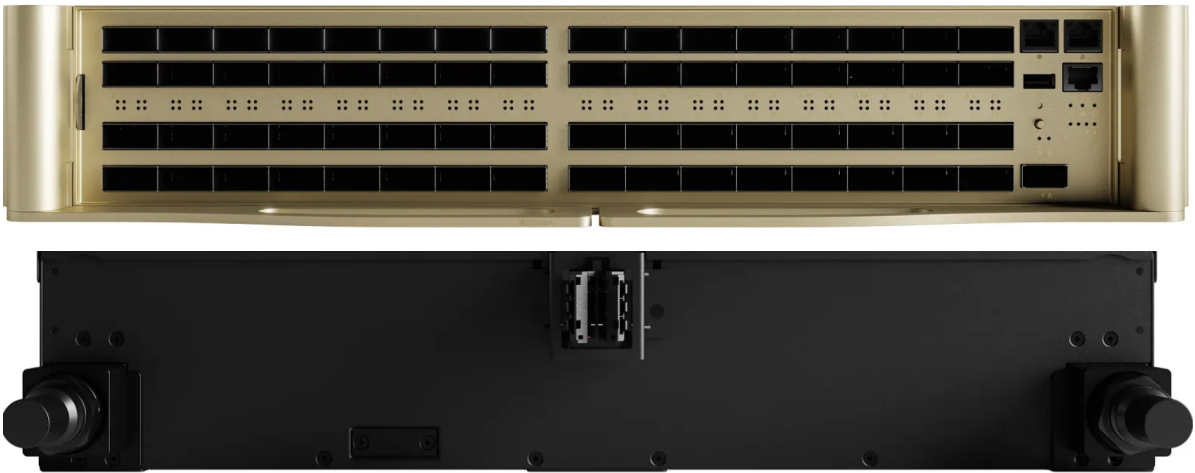
5 Introduction

The SN6000 series, based on the 102.4 Tb/s Spectrum-6 ASIC, is available in multiple configurations for high-performance L2/L3 forwarding across leaf, spine, and superspine deployments. The platforms deliver full wire-speed throughput, ultra-low latency, and 160 MB per ASIC of fully shared packet buffer.

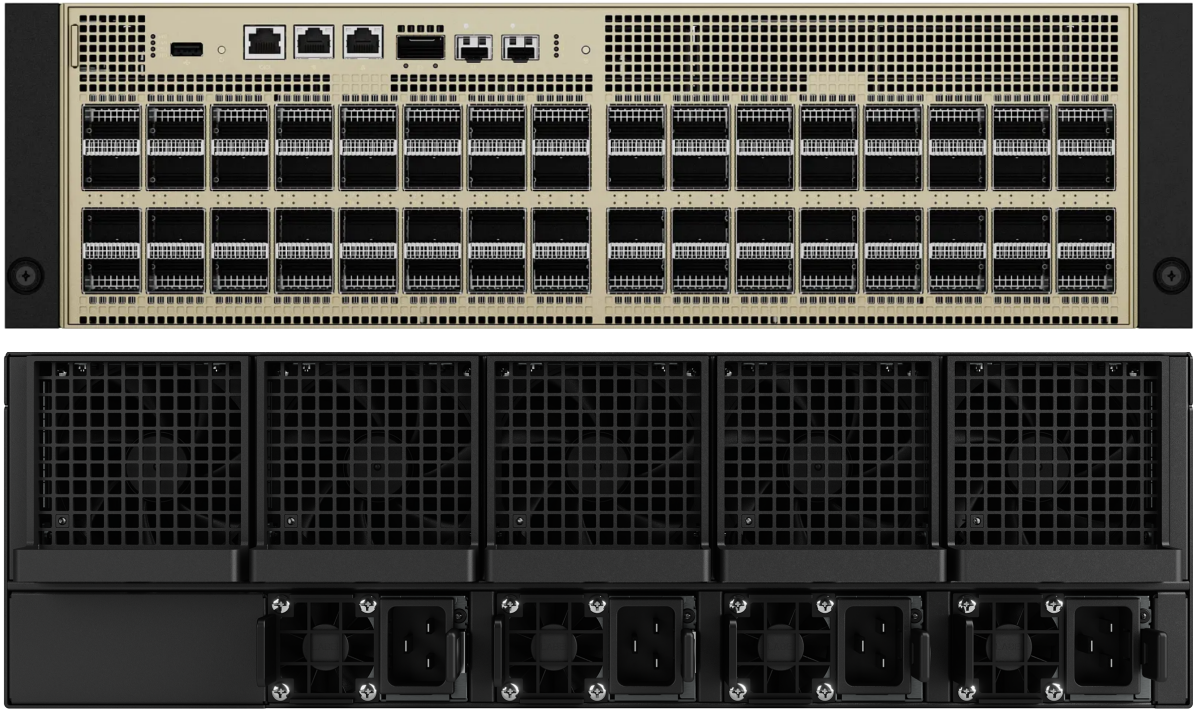
- The SN6600-LD is a fully liquid-cooled switch, featuring 64 RHS type OSFP cages supporting 128 ports of up to 800 Gb/s in a compact 2RU form factor. It provides 102.4 Tb/s of total throughput for scalable GPU-cluster connectivity. Leveraging pluggable RHS transceivers ecosystem, it is optimized for NVIDIA Spectrum-X Ethernet and supports AI-optimized leaf/spine architectures in middle-of-row (MoR) and end-of-row (EoR) designs. Its 48–60 VDC busbar power design reduces racking time, improves power efficiency, and simplifies maintenance in high-density data center environments.
- The SN6600 system is AC-powered and air-cooled, with Connector-to-Power (port side intake) Ethernet switch, featuring 64 IHS type OSFP cages supporting 128 ports of up to 800 Gb/s in 3RU form factor. It provides 102.4 Tb/s of total throughput for scalable GPU-cluster connectivity. Leveraging pluggable IHS transceivers ecosystem, it is optimized for NVIDIA Spectrum-X Ethernet and supports AI-optimized leaf/spine architectures in MOR (Middle of Row) or EOR (End of Row) Datacenters designs.
- The SN6810-LD is a Spectrum-6 SiPho (Silicone Photonics) switch designed to deliver high-performance Ethernet connectivity for AI clusters. Driven by a single Spectrum-6 ASIC, it delivers 102.4 Tb/s of switching capacity leveraging co-packaged optics (CPO) with lower power consumption, low-latency single-mode fiber connectivity based on MMC-16. It features a 2RU liquid-cooled design UQD8 v2 connectors and a 48–60 VDC busbar power architecture as part of NVIDIA's MGX v1.2 Rack solution build for high-density AI data centers.
- SN6800 is the industry's first 4-ASIC Silicone Photonics Ethernet switch for AI scale-out, delivering unmatched radix, optical density, and power efficiency for next-generation AI fabrics. Optimized for Spectrum-X Ethernet, SN6800 is a 5RU switch that features 2048 ports of 200 Gb/s connectivity via MMC-16 optical fibers, delivering 409.6 Tb/s of switching capacity utilising 4 Spectrum-6 ASIC with internal fibers shuffling, supporting up to 2,048 breakout connections for massive GPU-cluster scale-out.

For a complete list of available ordering options, see [Ordering Information](#).

SN6600-LD Front and Rear View



SN6600 Front and Rear View



SN6810-LD Front and Rear View



SN6800-LD Front and Rear View



5.1 Speed and Switching Capabilities

The following table describes maximum throughput and interface speed per system model. The systems support different interfaces and speed rates using QSFP/QSDP-DD/OSFP to SFP adapters or breakout cables. For further information, see [Splitter \(Breakout\) Cables and Adapters](#).

System Model	Interfaces	Supported Rates	Max Throughput
SN6600-LD	64 x OSFP 1 x QSFP112	128 x 800GbE 256 x 400GbE 512 x 200GbE 512+2 x 100GbE	102.4 Tbps

System Model	Interfaces	Supported Rates	Max Throughput
SN6600	64 x OSFP 1 x QSFP112 2 x SFP28	128 x 800GbE 256 x 400GbE 512 x 200GbE 512 +2 x 100GbE 2 x 25/10/1GbE	102.4 Tbps
SN6810-LD	128 x MMC-16 1 x QSFP112	128 x 800GbE 256 x 400GbE 512 x 200GbE 512+2 x 100GbE	102.4 Tbps
SN6800-LD	512 x MMC-16 4 x QSFP112	2048 x 200GbE 2048 + 8 x 100GbE	409.6 Tbps 4 x SPC-6 ASICs, Internal shuffling

5.2 Management Interfaces, PSUs, and Fans

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

System Model	USB Type-A	RJ45 OOB Management Port	RJ45 BMC Management Port	RJ45 Serial Console port (Management+BMC)	Power Supply Unit	Fan Unit
SN6600-LD	1	1	1	1	N/A	N/A
SN6600	1	1	1	1	4, Rear	5, Rear
SN6800-LD	1	2	1	1	N/A	N/A
SN6810-LD	1	2	1	1	N/A	N/A

5.3 Features

For a full feature list, refer to the [SN6000 Product Brief](#).

5.4 Certifications

For a list of certifications (such as EMC, safety, and others), contact your NVIDIA representative.

6 Installation

6.1 System Installation and Initialization

Pay close attention to the mechanical, power, and thermal precautions for rack-mounted equipment during the installation and initialization processes.

 The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Take precautions to guarantee proper ventilation so that the system maintains sufficient 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 steps:

1. Review the [safety warnings](#).
2. Review the [Liquid-Cooled Systems Deployment](#) instructions.
3. Review the [airflow directions](#) for the system and rack.
4. Make sure that the [package contents](#) are not missing or damaged.
5. [Mount the system](#) into a rack enclosure.
6. [Power on the system](#).
7. Perform a [system bring-up](#).
8. (Optional) [FRU replacements](#).

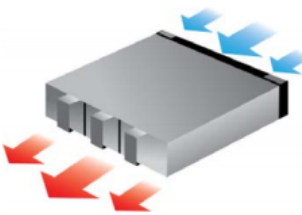
6.2 Airflow

 This section applies to the SN6600 systems only. All other systems in this series are cooled by a liquid cooling mechanism. For further information, see [Liquid Cooling Specifications](#).

The SN6600 systems are offered with connector-side inlet to power-side outlet airflow.

 All servers and systems in the same rack should have the same airflow direction. Likewise, all FRU components must also have the same airflow direction. A mismatch in the airflow will affect the heat dissipation.

The table below provides an airflow color legend:

Direction	Description
	Connector side inlet to power side outlet. The arrows indicate the flow of air from the connector-side inlet to the power-side outlet.

6.3 Package Contents

Before installing your new system, unpack it and make sure all parts are included and undamaged. If anything is missing or damaged, contact networking-support@nvidia.com.

The packages include:

SN6600-LD/SN6810-LD	SN6600	SN6800-LD
• 1x System • 1x Rail kit • 2x Ejector bars • 1x Harness: HAR000028 – Harness RS232 2M cable (DB9 to RJ-45)	• 1x System • 1x Rail kit • 2x Ejector bars • 1x Harness: HAR000028 – Harness RS232 2M cable (DB9 to RJ-45)  Power cords and cable retainers are not included in this package, and can be ordered separately.	• 1x System • 1x Rail kit • 2x Ejector bars • 1x Harness: HAR000028 – Harness RS232 2M cable (DB9 to RJ-45)

 If the product is supplied with dust caps, do not remove them until installation is required.

 Keep dust caps installed on all unused ports to prevent foreign object contamination of the cage and to sustain the cooling air-pressure within the system.

6.4 Mounting Options

For installation instructions, refer to the following table:

System Model	Rail Kit
SN6600-LD/SN6810-LD	SN6600-LD/SN6810-LD Rail Kit
SN6600	SN6600 Rail Kit
SN6800-LD	SN6800-LD Rail Kit

6.5 SN6600-LD/SN6810-LD Rail Kit

The SN6600-LD and SN6810-LD systems are compatible with NVIDIA MGX v1.2 racks.

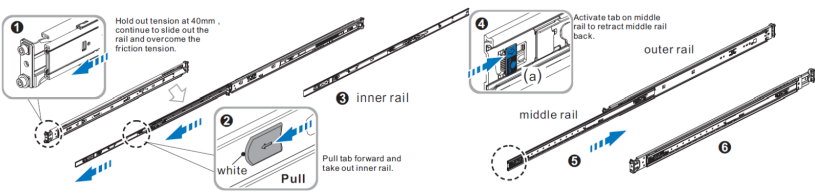
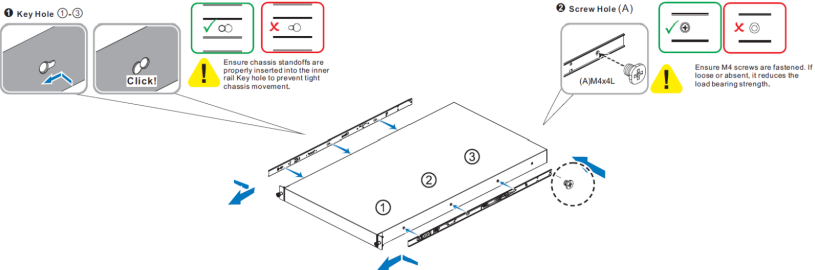
Kit Part Number	Description
930-9SKIT-00LO-00F	Installation kit for standard 2U switches in MGX v1.2 racks

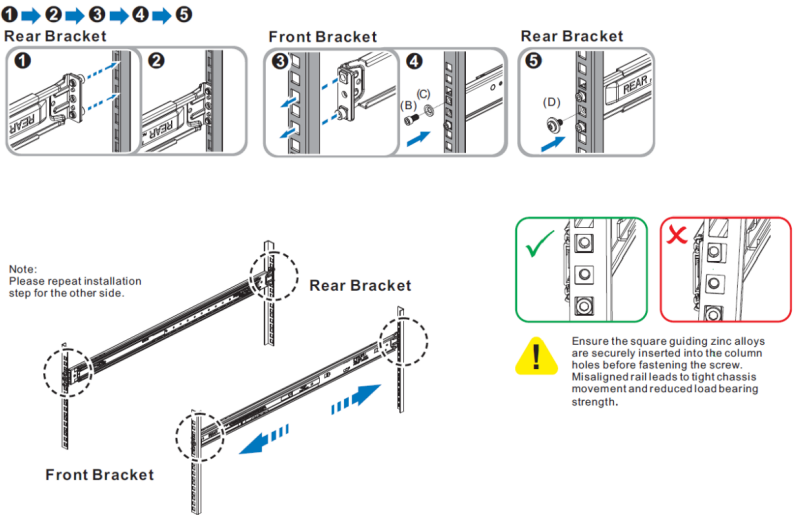
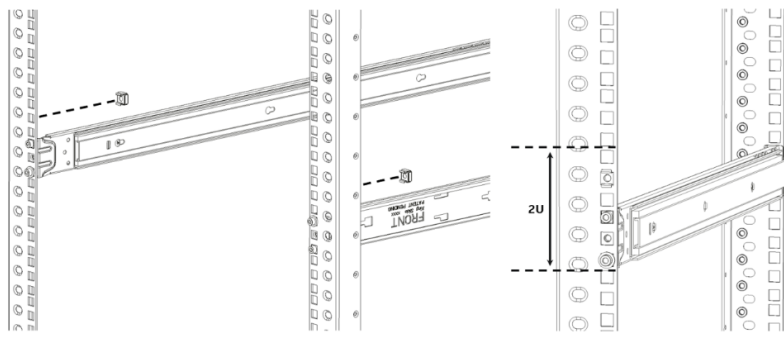
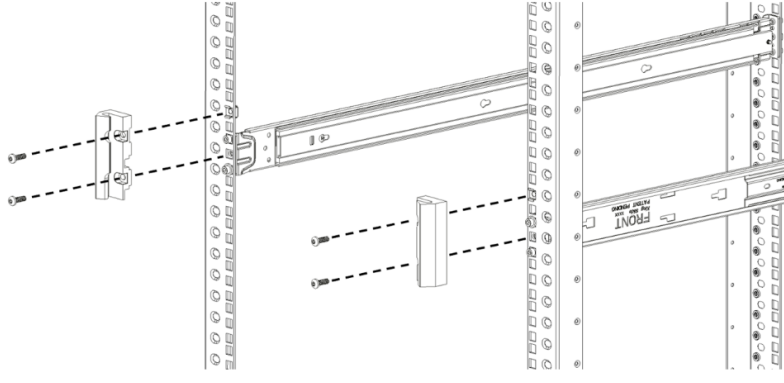
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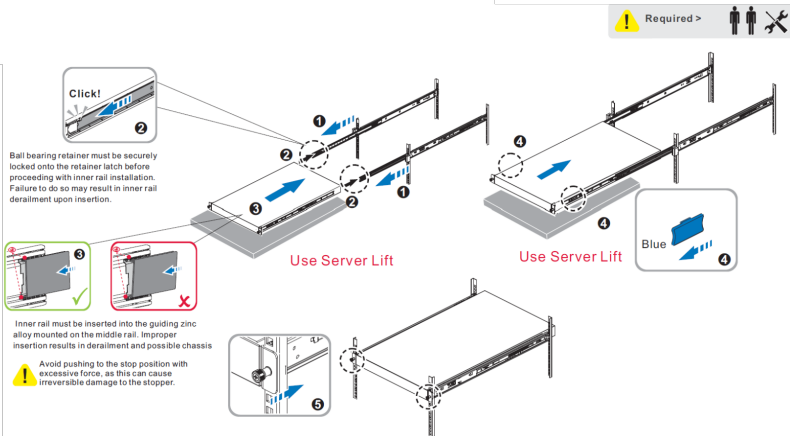
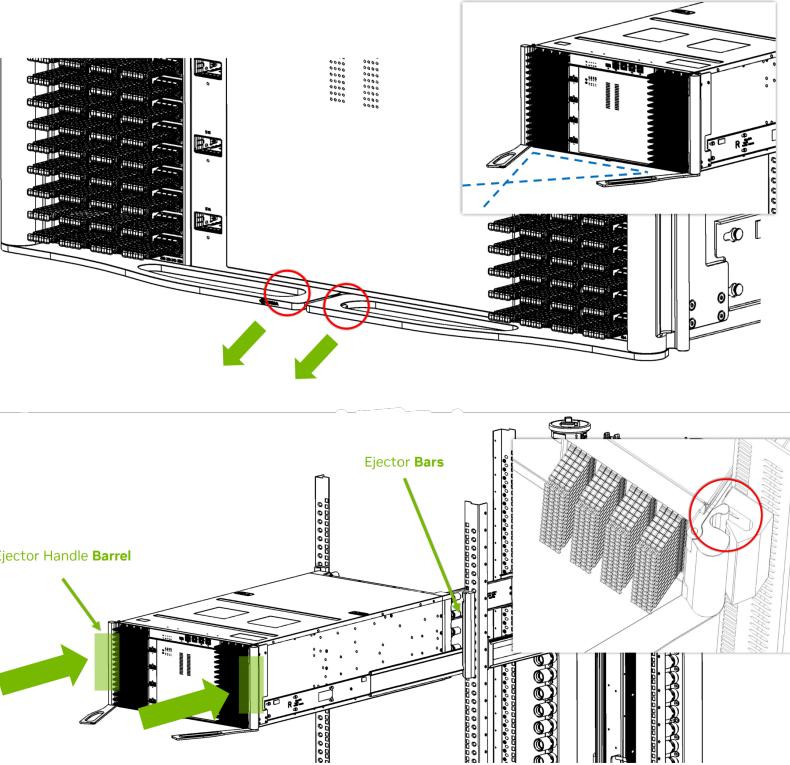
6.5.1 Package Contents

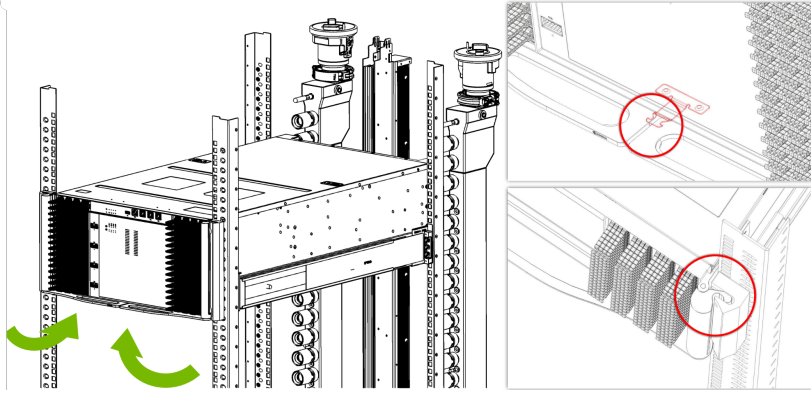
SCREW PACK							
Name	Image	Quantity	Torque(kgf. cm)	Name	Image	Quantity	Torque(kgf. cm)
(A)M4x4L(P0.7)		2	15~20	(C)SPACER		2	
(B)SHC-M5x10.0L-P0.8		2	20~25	(D)TORX-M5x10.0L-P0.8		2	20~25

6.5.2 Installation Instructions

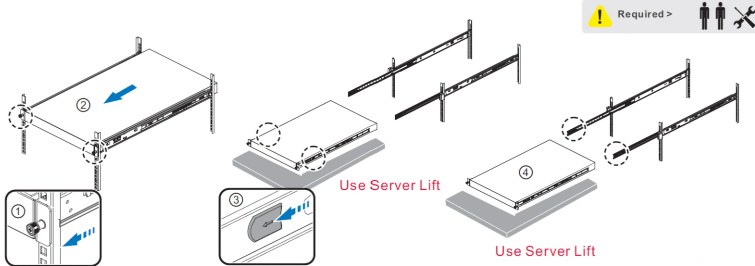
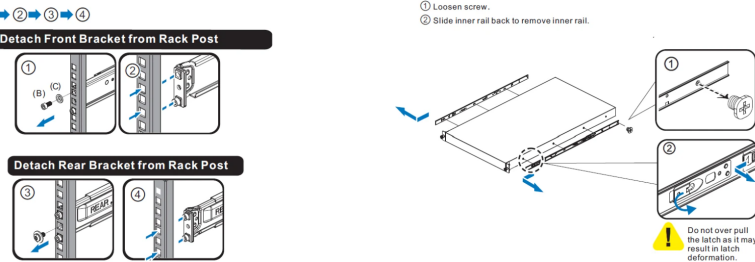
Description	Illustration
1. Remove the inner rail.	 1 Hold out tension at 40mm, continue to slide out the rail and overcome the friction tension. 2 Pull tab forward and take out inner rail. 3 inner rail 4 Activate tab on middle rail to retract middle rail back. 5 middle rail 6 outer rail
2. Install the inner rail onto the chassis.	 1 Key Hole (1-3) 2 Click! 3 Ensure chassis standoffs are properly inserted into the inner rail Key Hole to prevent tight chassis movement. 4 Screw Hole (A) 5 Ensure M4 screws are fastened. If loose or absent, it reduces the load bearing strength.

Description	Illustration
3. Fix the outer rail bracket/assembly to the frame. The front and rear brackets must be securely fastened on the rack post before proceeding with chassis installation. Failure to do so risks rail detachment from rack post and subsequent chassis fall-off.	 1 2 3 4 5 Rear Bracket Front Bracket Rear Bracket Note: Please repeat installation step for the other side. Rear Bracket Front Bracket Ensure the square guiding zinc alloys are securely inserted into the column holes before fastening the screw. Misaligned rail leads to tight chassis movement and reduced load bearing strength.
4. Attach the DGX ejector bars to the rack posts: a. Insert four M5 cage nuts in the desired slots of the rack above the rear brackets. Make sure to secure the nuts in the correct location within the 2U enclosure, as shown in the below illustration. b. Attach the left and right ejector bars to the rack by screwing two screws in each bar. Tighten the screws to secure the ejector bars in the rack's posts, applying a torque of 2.0 +/-0.1 Nm. Make sure the ejector bars do not protrude over the rack posts	⊗ CRITICAL ORIENTATION REQUIREMENT The switch must be mounted in an upright position. Verify the correct orientation before inserting the unit into the rack rails. Step A  Step B 

Description	Illustration
5. Insert the chassis to complete the installation: - Pull the middle rail fully extended in lock position, ensure ball bearing retainer is located at the front of the middle rail. - Insert the chassis into middle-outer rails. - When hit a stop, please pull/push the blue release tab on the inner rails. - Tighten chassis with shipping screws.	 Click! Ball bearing retainer must be securely locked onto the retainer latch before proceeding with inner rail installation. Failure to do so may result in inner rail derailment upon insertion. Use Server Lift Blue Inner rail must be inserted into the guiding zinc alloy mounted on the middle rail. Improper insertion results in derailment and possible chassis damage. ! Avoid pushing to the stop position with excessive force, as this can cause irreversible damage to the stopper.
6. Push on the latches to release the handles - Fully open the handles. - Push the system in by the handle barrels (indicated in green) until the barrels meet the bars on the system post. - Use the handles to push the system the remaining distance and lock it onto the hook as illustrated below. - Ensure the barrels are fully engaged with the bars.	 Ejector Bars Ejector Handle Barrel

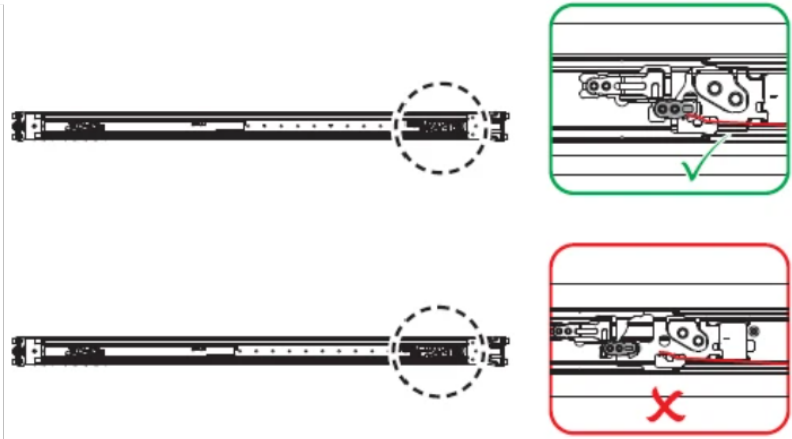
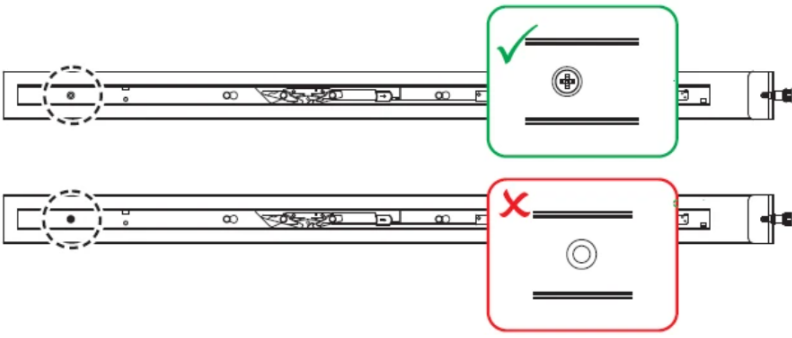
Description	Illustration
	

6.5.3 Disassembly Instructions

Description	Illustration
1. Remove the chassis in a limited space - ① ② Loosen the shipping screws, then rotate and pull the cantilever handle to unlatch and pull out the chassis. ③ ④ Once fully extended into the locked-out position, pull the disconnect tab forward to remove the chassis.	 Use Server Lift Use Server Lift
2. Detach the front / rear brackets from the rack posts.	① ② ③ ④ Detach Front Bracket from Rack Post ① ② Detach Rear Bracket from Rack Post ③ ④ ① Loosen screw. ② Slide inner rail back to remove inner rail.  Do not over pull the latch as it may result in latch deformation.

6.5.4 Troubleshooting

Description	Illustration
Failure Mode: Chassis falling off or tilting after installation	
• Cause 1: The operator installed the unit without fastening the screws on the front and rear brackets, or the screws were fastened loosely, causing them to detach. • Solution: Ensure the correct screws are selected and securely tightened.	
• Cause 2: The inner rail derailed from the middle rail during installation. This is likely because the ball bearing retainer was not locked by the retainer latch during inner rail installation, or the inner rail was not properly inserted into the guiding zinc alloy mounted on the middle rail. • Solution: Ensure the ball bearing retainer is securely locked onto the retainer latch before installing the chassis or inner rail. Additionally, verify that the inner rail is properly aligned with and slotted into the guiding zinc alloy during installation.	
• Cause 3: The square guide on the front bracket was improperly inserted into the rack column holes. • Solution: Ensure the square guide block on the front bracket is fully inserted into the column holes before tightening the screw.	

Description	Illustration
Failure Mode: Stiff or tight chassis movement	
• Cause 1: Chassis standoffs were incorrectly slotted into the keyholes, resulting in a distorted rail profile. • Solution: Ensure all standoffs are properly aligned and inserted into their corresponding keyholes.	
• Cause 2: The ball bearing retainer was not locked onto the retainer latch during inner rail insertion, causing the inner rail to detach from the ball bearing retainer. • Solution: Ensure the ball bearing retainer is securely locked onto the retainer latch before inserting the inner rail.	
Failure Mode: Insufficient or abnormal load-bearing strength	
• Cause 1: The inner rail was attached to the chassis without securing the screws. • Solution: Ensure the M4 screws are securely fastened.	

Description	Illustration
• Cause 2: The square guide on the front bracket was incorrectly inserted into the rack column holes. • Solution: Ensure the square guide block on the front bracket is fully inserted into the column holes before tightening the screw.	

6.6 SN6600 Rail Kit

Kit Part Number	Description
930-9SKIT-00LO-00G	NVIDIA Rail-Kit for SN6600

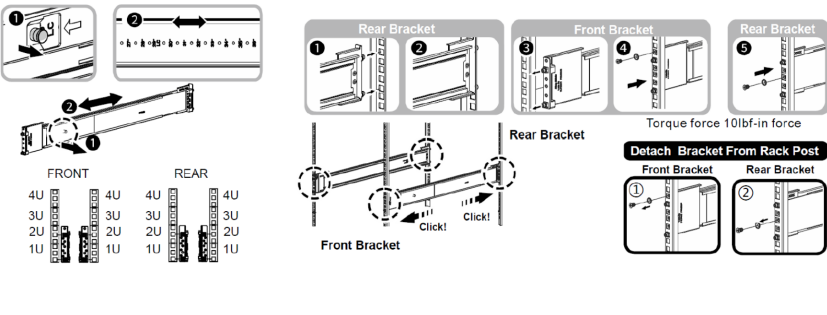
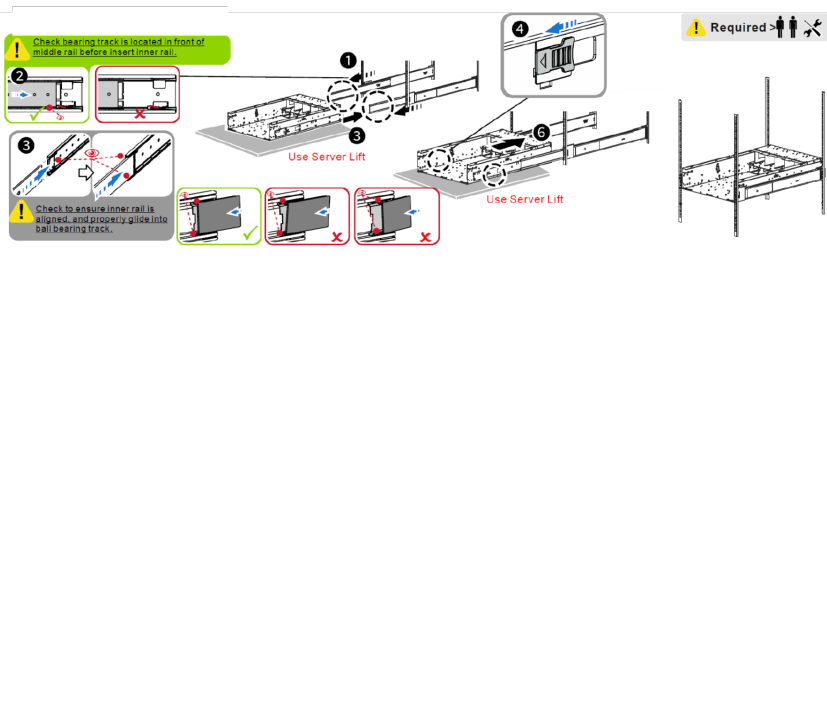
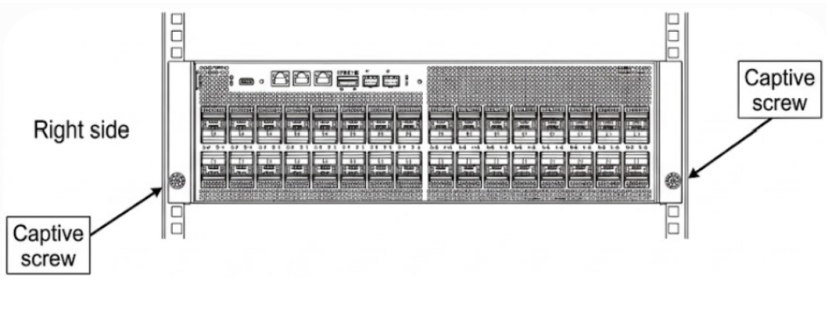
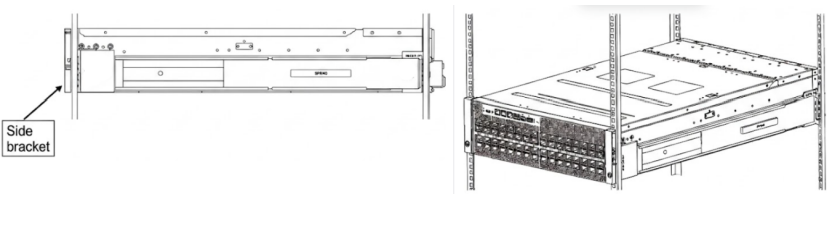
The following instructions have been prepared and provided with permission from King Slide.

6.6.1 Installation Instructions

✖ **CRITICAL ORIENTATION REQUIREMENT**

The switch must be mounted in an upright position. Verify the correct orientation before inserting the unit into the rack rails.

Description	Illustration
1. Remove the inner rail. 2. Push Part a and slide the middle rail back.	
2. Install the inner rail onto the chassis.	
Ensure the inner rail is installed in the correct orientation:	Left Right

Description	Illustration
3. Fix the outer rail/bracket assembly to the frame.	 FRONT 4U 3U 2U 1U REAR 4U 3U 2U 1U Rear Bracket Front Bracket Click! Click! Torque force 10lbf-in force Detach Bracket From Rack Post Front Bracket Rear Bracket
4. Insert the chassis to complete the installation. ① ② Pull the middle rail out until it is fully extended and locked in position. Ensure the ball bearing retainer is located at the front of the middle rail. ③ Align the inner rail with the middle-outer rail, keeping the chassis level (horizontal) during insertion. ④ ⑤ Insert the chassis carefully. When it reaches the stop, pull the blue release tab on the inner rail to disengage the lock, then continue sliding the chassis in. ⑥ Push the chassis all the way back into the rack until it is fully seated and secured.	 Check bearing track is located in front of middle rail. Before insert inner rail. Check to ensure inner rail is aligned and properly slide into ball bearing track. Use Server Lift Use Server Lift Required > 2
5. After sliding the system into the rack, tighten the captive screws on both sides to further secure the system to the rack posts.	 Right side Captive screw Captive screw
6. Upon completion of the installation, the side brackets should be attached to the rail as shown below.	 Side bracket

6.7 SN6800-LD Rail Kit

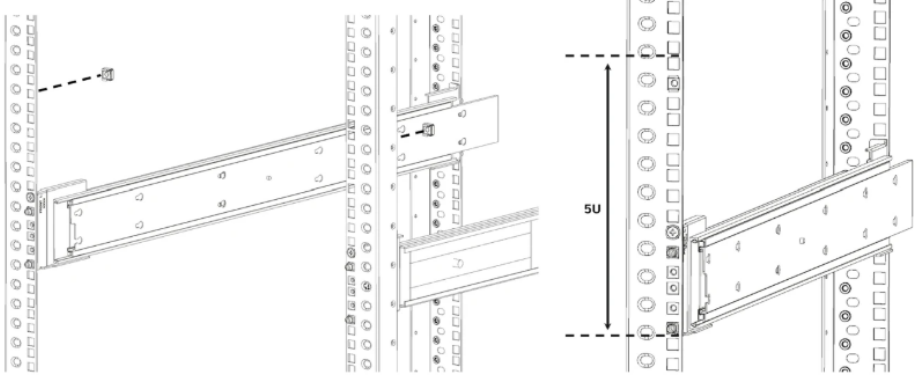
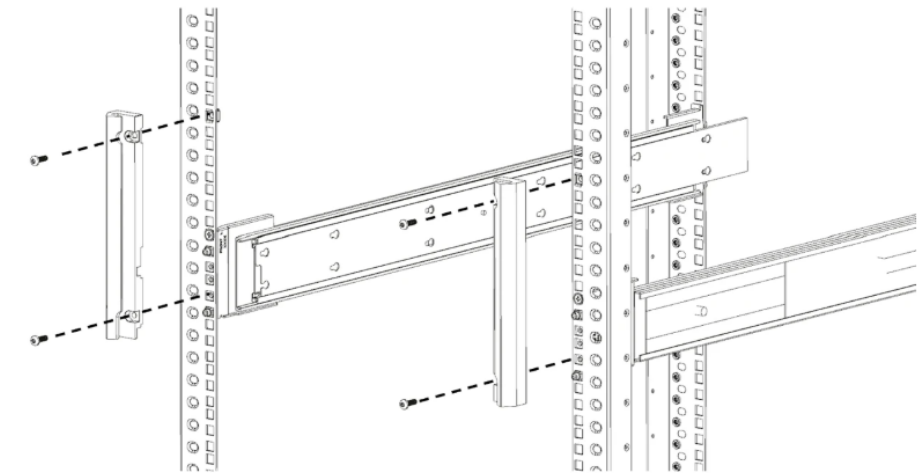
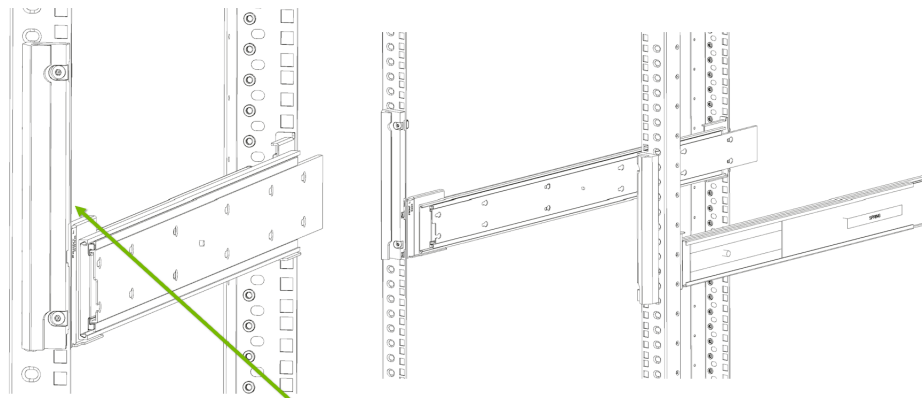
The SN6800-LD system is compatible with NVIDIA MGX v1.2 racks.

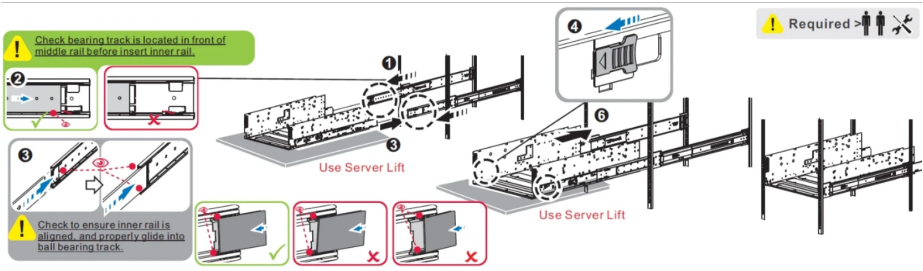
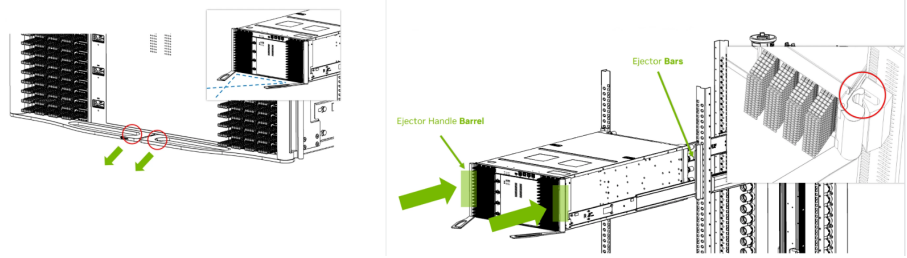
Kit Part Number	Rack Size and Rack Depth Range
930-9SRKT-00F0-00C	Rack mounting kit for NVIDIA SN6800-LD switch in MGX v1.2 rack

The following instructions have been prepared and provided with permission from King Slide.

6.7.1 Installation Instructions

Description	Illustration
1. Remove the inner rail. 2. Push Part a and slide the middle rail back.	Pull tab forward and take out inner rail. White Pull Click! outer rail inner rail Push tab to slide the middle rail back. (a)
3. Install the inner rail onto the chassis.	1 Key Hole ①-③ 2 Screw Hole Click! b M4X4L Torque force 10lbf-in Detach Inner Rail From Standoff 1 2 Push 3 Push the latch upward and remove the keyhole from standoff.
4. Secure the outer rail/bracket assembly to the frame.	1 2 FRONT 4U 3U 2U 1U 4U 3U 2U 1U REAR 4U 3U 2U 1U 4U 3U 2U 1U Rear Bracket Front Bracket Click! Click! Torque force 10lbf-in force Detach Bracket From Rack Post 1 Front Bracket 2 Rear Bracket

Description	Illustration
5. Attach the DGX ejector bars to the rack posts: Step A Insert two M5 cage nuts in the desired slots of the rack above the rear brackets. Make sure to secure the nuts in the correct location within the 5U enclosure, as shown in the below illustration. Step B Attach the left and right ejector bars to the rack by screwing two screws in each bar. Tighten the screws to secure the ejector bars in the rack's posts, applying a torque of 2.0 +/-0.1 Nm	Step A  Step B 
Make sure the ejector bars do not protrude over the rack posts.	❌ CRITICAL ORIENTATION REQUIREMENT The switch must be mounted in an upright position. Verify the correct orientation before inserting the unit into the rack rails. 

Description	Illustration
6. Insert the chassis to complete the installation. • ① ② Pull the middle rail out until it is fully extended and locked in position. Ensure the ball bearing retainer is located at the front of the middle rail. • ③ Align the inner rail with the middle-outer rail, keeping the chassis level (horizontal) during insertion. • ④ ⑤ Insert the chassis carefully. When it reaches the stop, pull the blue release tab on the inner rail to disengage the lock, then continue sliding the chassis in. • ⑥ Push the chassis all the way back into the rack.	
7. Push on the latches to release the handles. • Fully open the handles. • Push the system in by the handle barrels (indicated in green) until the barrels meet the bars on the system post. • Use the handles to push the system the remaining distance and lock it onto the hook as illustrated below. • Ensure the barrels are fully engaged with the bars.	

Description	Illustration

6.7.2 Disassembly Instructions

Description	Illustration
Remove the chassis from the rack.	

6.8 Liquid-Cooled Systems Deployment

6.8.1 Overview

The SN6600-LD, SN6810-LD and SN6800-LD liquid-cooling systems feature parallel cooling loops operating concurrently. refer to [Specifications](#) for Coolant, pressure and volumes needed for the switches.

6.8.2 Deployment

6.8.2.1 Inserting the Switch Module (Liquid System Related)

The switch modules are pre-filled with nitrogen gas in the cooling system, pressurized to at least 1 psi. If the pressure is below 1 psi, perform a "Pressure Hold": refill to 50 psi with N2, wait 12

hours, and verify that the pressure remains above 48 psi to pass. Positive nitrogen pressure prevents humidity or dust ingress.

Note: The switch modules feature integrated Universal Quick Disconnect (UQD8) connectors that protrude directly from the chassis. They are designed to blind-mate directly into the MGX rack manifold cooling loop upon insertion. External extension hoses are **not** required or used for deployment.

Before inserting the switch module into the rack, the protective nitrogen gas must be completely purged from all internal cooling loops using the open-ended purge hose provided in the maintenance kit.

Purging Procedure:

1. Identify the number of UQDs pairs for your specific switch model (see table below), each pair is inlet and outlet of a cooling loop.

 Make sure to save the UQD protective covers (caps) provided with the switch. Do not discard them, as they can be reused during RMA preparation.

2. For **each** pair of UQDs, connect the open-ended maintenance purge hose to the outlet UQD8 connector to automatically expel the gas.
3. Disconnect the purge hose once the gas is fully released from the loop.
4. Repeat for all remaining pairs on the switch before proceeding with final insertion.

Switch Model	Number of Cooling Loops to Purge	Connection Type
SN6600-LD	1 Loop (1 Blue Inlet / 1 Red Outlet)	Direct Blind-Mate (No hoses)
SN6810-LD	2 Loops (2 Blue Inlets / 2 Red Outlets)	
SN6800-LD	5 Loops (5 Blue Inlets / 5 Red Outlets)	



Failure to fully flood the cooling system with liquid before powering-on may cause significant damage and void the warranty.

6.8.2.2 Liquid-Cooling System Related Actions

6.8.2.2.1 Pressure Check of Nitrogen-Filled Components

Purpose:

- Confirm that cold plate assemblies, switch trays, and manifolds retain supplier-filled N2 pressure, ensuring no leaks during transit.

Required Hardware:

- Digital pressure gauge (0–2.1 bar or 0–3.4 bar), data logging.

Process

- Scan the QR code, log pressure
- Release the internal pressure
- Cycle time: <1 minute

Pass/Fail Criteria

- Must retain ≥ 1 psi.
- If the pressure is lower than 1 psi, please perform a "Pressure Hold" test as follows:
 - Refill to 50 psi with N2
 - Wait 12 hours
 - Recheck the pressure. If the pressure is above 48 psi, the unit has passed the test.
- Failures are returned to the supplier.

6.8.2.2.2 PG25 Coolant Fill

Purpose:

- To fill assemblies (both individual components and full racks) with 25% propylene glycol, and 75% water solution, ensuring complete fluid coverage and air removal for optimal thermal performance.

Required Hardware:

- For vacuum fill: Vacuum pump, liquid trap
- For positive pressure fill: Fill pump
- 25-micron filter on the supply side (for both the component and the rack)

Process

- Vacuum Fill:
 - Pull vacuum on the assembly from the outlet quick disconnect (QD).
 - Fill the fluid from the inlet QD.
 - Stop filling when the fluid enters the liquid trap.
 - Vacuum specification: 5 kPa or less.
- Positive Pressure Fill:
 - Use a fill pump to introduce coolant.
 - Circulate the fluid back into the reservoir briefly to ensure no bubbles remain.

Pass/Fail Criteria

- Fluid reservoir weight can optionally be measured before and after filling as a quality check.

Caveats:

- If using a positive pressure pump with circulation, ensure a 25-micron filter is installed on the supply side.

- If the assembly is complex with multiple fluidic elevations or high points, vacuum filling is preferred.
- Expected Cycle Time: 2–3 minutes.

For more information on the RMA procedure, see [System Disassembly, Disposal, and RMA Instructions](#).

6.9 Data Interfaces and High Power Transceivers Support

6.9.1 Data Interfaces

The data interfaces can be used with OSFP modules or transceivers. For a complete list of interfaces per system, refer to [Speed and Switching Capabilities](#).

As detailed in the following table, for additional data interfaces, each OSFP port can be connected with an OSFP cable or module to SFP (Dynamix QSA™) adapters, hybrid, or splitter cables.

Model Family	Ports	Maximum Speed
SN6600	128	800GbE
	256	400GbE
	512+2	200GbE
	512+2	100GbE
	2	25GbE/10GbE/1GbE
SN6600-LD	128	800GbE
	256	400GbE
	512	200GbE
	512+2	100GbE
SN6810-LD	128	800GbE
	256	400GbE
	512	200GbE
	512+2	100GbE
SN6800-LD	2048	200GbE
	2048+8	100GbE

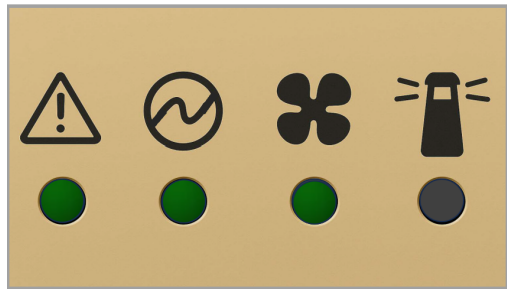
6.9.2 High Power Transceivers Support

The systems offer several high-power ports for optical transceivers that require such support. The following table specifies each system's ports max power capabilities:

Model Family	Ports	Maximum High Power Support
SN6600	64x OSFP ports	30W
	1x QSFP-112	10W
	2x SFP28	2.5W
SN6600-LD	64x OSFP ports	30W
	1x QSFP-112	10W

6.10 Initial Power On

Each system's input voltage is specified in the [Specifications](#) chapter.

SN6600 System	SN6600-LD, SN6800-LD And SN6810-LD Systems
The power cords should be standard 3-wire AC power cords including a safety ground and rated for 16A or higher.  The system platform will automatically power on when AC power is applied. The system has no power switch. Check all 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. If after five minutes the System Status LED is still amber, unplug the system and contact 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 LED Notifications.  *Exact LED location and shape may vary.  After inserting a power cable and confirming the green System Status LED light is on, make sure that the Fan Status LED is also green. If the Fan Status LED is not green, unplug the power connection and make sure that the fan module is inserted properly and that the mating connector of the fan unit is free of any dirt or particles. If the problem persists, contact your NVIDIA representative.  Risk of electric shock and energy hazard. Disconnect all power supplies to ensure the switch platform is powered down.	The systems are powered by a DC busbar. No power cords are required. 1. Wait for the System Status LED to turn green. If after five minutes the System Status LED is still amber, turn the system off, and contact your NVIDIA representative for assistance. 2. 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 LED Notifications.  *Exact LED location and shape may vary.

6.11 System Bring-Up

6.11.1 Network Operating Systems

Consult the following table to learn which operating systems are supported by each of the platforms.

Platform	Cumulus	SONiC
SN6600-LD	V	V
SN6600	V	V
SN6810-LD	V	V
SN6800-LD	V	-

6.11.1.1 Configuring Network Attributes Using Cumulus Linux

For Cumulus Linux configuration instructions, see the [Cumulus Linux Quick Start Guide](#). Cumulus Linux uses the OpenSSH package to provide access to the system using the Secure Shell (SSH) protocol. To securely access a Cumulus Linux switch remotely, see [SSH for Remote Access](#).

6.11.1.2 Configuring Network Attributes Using SONiC

For SONiC configuration instructions, see *Configuring the Switch for the First Time* in the SONiC User Manual, available from the [NVIDIA Enterprise Support Portal](#).

6.12 FRU Replacements

 For a complete list of field-replaceable units, see [Accessory and Replacement Parts](#).

6.12.1 Power Supplies

 This section applies to SN6600 systems only. All other systems in this series are powered by DC busbars.

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

 If you are replacing one of the PSUs, make sure that the power supply unit LED for the unit you are NOT replacing displays a green status while the system is up and running.

To extract a power supply unit:

1. Remove the power cord from the power supply unit.

2. Grasp the handle and 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.

To insert a power supply unit:

1. Make sure the new unit's mating connector is free of dirt or debris.



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

2. Make sure that the board connector is located on the right (looking from the system's rear side forward), and insert the unit by sliding it into the opening until you feel a slight resistance.
3. Continue pressing the power supply unit until it seats completely. The latch will snap into place, indicating that it is properly installed.
4. Insert the power cord into the supply connector.
5. Insert the other end of the power cord into the AC outlet/PDU of the correct voltage. The power supply unit LED should display a green status, indicating that the unit is successfully installed and operational. If the power supply unit LED indicates a different status, repeat the extraction steps, then follow the insertion steps again.

6.12.2 Fans



This section applies to SN6600 systems only. All other systems in this series are cooled by a liquid cooling mechanism.

The system has 4+1 fan module redundancy. Full operation requires 2 total fan modules.

Each fan module contains 2 individual rotors. If one fan module becomes faulty or defective, NVIDIA recommends replacing it immediately to ensure continued redundancy. This is particular important when the system is operating at 35°C ambient temperature at full capacity with all ports occupied. Use your network operating system to monitor switch hardware elements, including fans.



Make sure that all fan configurations match their respective model numbers. If the fans are not configured properly, the unit might overheat and shut down automatically to prevent damage. For power supply unit airflow directions, refer to [Air Flow](#).

To remove a fan unit:



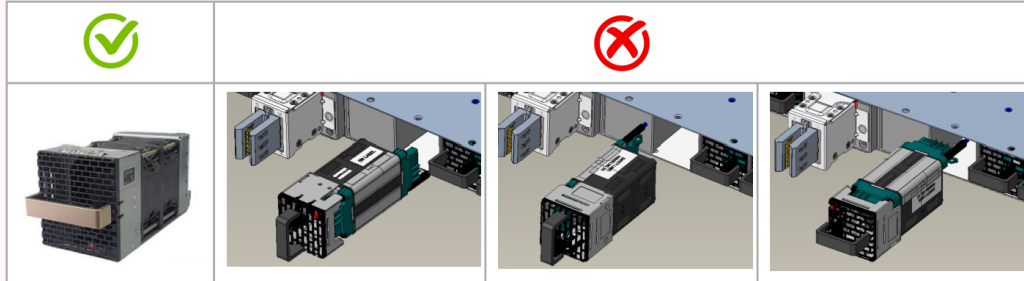
When replacing a faulty fan unit in an operational switch system, do not leave the slot unpopulated for more than 60 seconds.

1. Grasp the handle and pull the unit towards yourself. As the fan unit unseats, the fan unit status LEDs will turn off.
2. Remove the fan unit.

To insert a fan unit:

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

✗ Do not attempt to insert the fan unit rotated in a 90°/180°/270° angle.



✗ Upon initial installation, the fan status LED should display a green status, indicating it is operational. If the fan status LED displays any other status, 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.

7 NVIDIA Interconnect for Spectrum-6 Based Ethernet Switches

7.1 Introduction

This chapter provides an overview and prerequisites for installing Single-Mode and Multi-Mode transceivers, Optical Fibers and Active Copper Cables. The new 200G/400/800G Ethernet interconnects make extensive use of pluggable optical transceivers and detachable optical fibers for easier installation, inspection and debugging.

For more information on best practices and recommendations to ensure best performance of our cables, refer to [NVIDIA Cable Management Guidelines](#).

7.2 Form Factors

NVIDIA Spectrum-6 systems utilize various port types to support flexible bandwidth options:

Form Factor	Description	Spectrum-6 Usage
OSFP - O ctal S mall F orm-factor P luggable	Connected to the ASIC with 8 electrical lanes.	The usage of the lanes enables setting versatile port speeds; for instance, an 800G port can be configured as 4 lanes of 200G or 8 lanes of 100G.
QSFP - Q uad S mall F orm-factor P luggable	Connected to the ASIC with 4 electrical lanes.	Spectrum-6 switches' QSFP112 utilizes 2 electrical lanes only to provide 2 discrete 100G general-purpose ports.
SFP28 - S mall F orm-factor P luggable	Utilizes 1 electrical lane to the ASIC.	Spectrum-6 switches may include a few SFP28 general-purpose ports, supporting 25G speed.

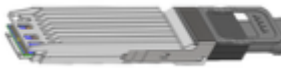
7.3 Interconnect Media and Cable Assemblies

7.3.1 Optical Transceiver Types

Internal Electronics

Type	Description
FRO - Full Retimed Optics	Employs DSP ICs on both transmit and receive paths.
TRO - Transmit only Retimed Optics	Utilizes DSP ICs in transmit only.

Transceiver Cooling

Type	Usage
Integrated Heat Sink 	Used in air cooled switches in OSFP form-factor.
Riding Heat Sink 	Used in liquid cool switches as well as server-side in OSFP and QSFP-112 form-factors.



Note: NVIDIA Rx side preference is precoded data; therefore, the Tx side facing the NVIDIA Rx side must transmit precoded data.

Transceiver Availability and Qualification

The following transceivers are in process of qualification for SN6600-LD:

OPN	Description
980-9IAS1-00XM00	NVIDIA twin port transceiver, 2xFR4, 1600Gbps, OSFP, 2xLC-LC, 1310nm SMF, up to 2km, RHS, FRO, XDR + Ethernet
980-9IAM1-00X00x	NVIDIA Linear Active Copper Cable, 1600Gbps to 1600Gbps, OSFP, 1.1m, RHS to RHS, NIC to NIC
980-9IAO6-00X00x	NVIDIA Linear Active copper splitter cable, 1600Gb/s to 2x800Gb/s, OSFP to 2xOSFP, 1m, RHS to RHS

7.3.2 Optical Fiber Options and Connectors

Structured cabling eases servicing of optical transceivers in the data center as transceivers are detachable from the cable. This also simplifies installation since no ESD-sensitive or bulky transceivers are involved during initial cabling runs.



Note: The maximum reach specifications of NVIDIA 400/800G Ethernet transceivers assume two optical connector junctions or patch panels in the link (a total of 4 ferrule-to-ferrule connections).

Type	Description
MPO-12/APC (Multiple Push-On 12-fiber, Angled Polished Connector)	Two MPO-12/APC optical connectors are used by both Single-Mode and Multi-mode transceivers. Uses 8 fibers in the Angled Polished Connector (APC) with an ~8-degree polish on the fiber end to deflect laser back-reflections into the cladding, avoiding laser damage and signal distortion. Uses 4 transmission (Tx) and 4 receive (Rx) fibers; the center 4 positions are unpopulated.
MPO-12/UPC (Multiple Push-On 12-fiber, Ultra Flat Polished Connector)	Commonly used in lower rates such as 100G (4x) Multi-Mode transceivers. The Ultra Flat Polished Connector reduces signal reflection for high-performance optics connectivity.

For MMC to MPO Pinout Mapping, see [Management Interface Specifications](#).



Note: MPO-12/APC and MPO-12/UPC connectors are not compatible.

7.3.2.1 Optical Fiber Cable Options

Type	Length / Reach
MPO Single-Mode straight cables	Total length up to 500m (including patch panels, trunks, and cables).
MPO Single-Mode splitter cables	Total length up to 50m (including patch panels, trunks, and cables).
MMC Single-Mode straight cables	Total length up to 500m (including patch panels, trunks, and cables).
LC Single-Mode straight cables	Total lengths of 2km (FR4), 6km/10km (LR4) (including patch panels, trunks, and cables).



For deployment with SN68x0-LD switches, only 8 lanes are utilized on the 16-position MMC connector (Pins 1–4 and 13–16). Positions 5–12 house dummy single-mode fibers and remain unpopulated for signal transmission.

7.3.3 Active Copper Cables Assemblies

Type	Description
LACC: Linear Active Copper Cables 	The cables use built-in linear equalizer and amplifiers to extend the reachability. The LACC cables support OSFP to 4xOSFP (twin 800G to 4x400G) and OSFP to 2xOSFP (twin 800G to 2x800G) breakouts.
ACC: Active Electric Copper Cables 	The cables use DSPs on each end-point. RHS to RHS and IHS to IHS versions of this cable are available, providing a direct connectivity of twin 800G ports.

7.3.4 Structured Cabling and Patch Panels

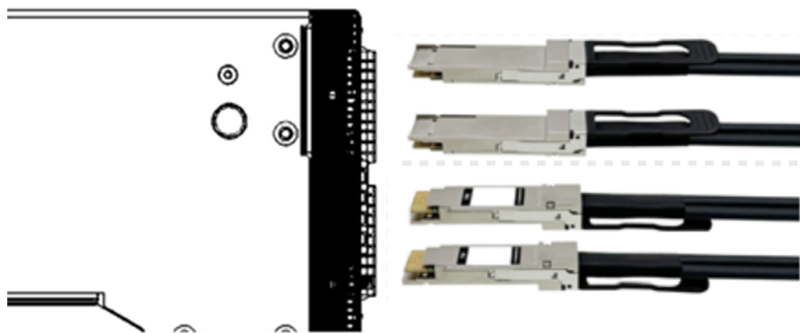
Patch panels have multiple ports that connect multiple devices together, organizing cables and enabling signal shuffling between endpoints (Servers to Leaves / Leaves to Spines)

7.4 Physical Installation and Hardware Layout

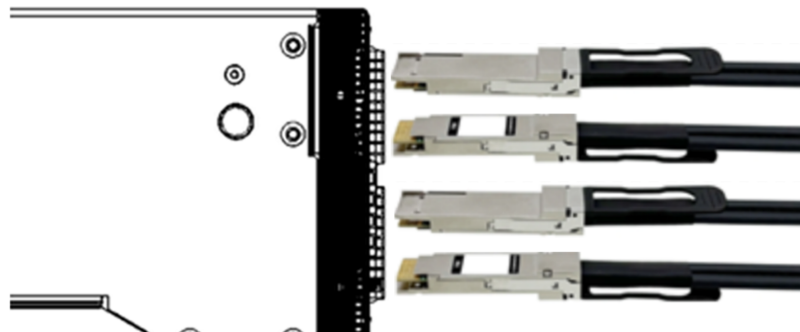
7.4.1 Cable Orientation

Verify the proper orientation of OSFP modules and cables prior to insertion into the chassis cages:

SN6600:



SN6600-LD:



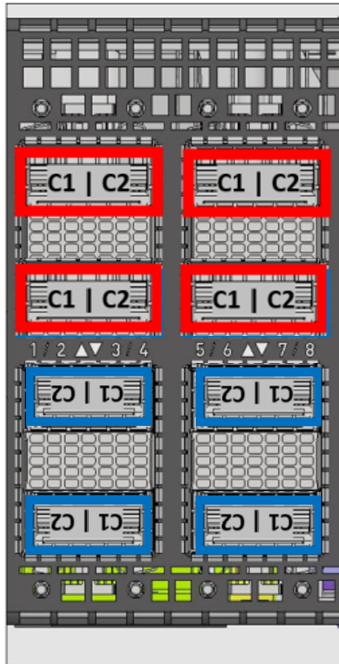
7.4.2 Connector Numbering in a Belly-to-Belly Configuration

SN6600-LD and SN6600 systems utilize OSFP cages. OSFP-based optical transceivers feature two distinctive ports that operate in a "belly-to-belly" cage layout:

OSFP is
Right Side Up

OSFP is
Upside Down

Twin 800G port allocation:



7.4.2.1 Twin 800G Port Allocation

Port Configuration	Physical Connector	NOS Description	Examples
800G + 800G	C1 + C2	swp	swp1, swp2

7.5 Logical Port Configuration and NOS Reflection

7.5.1 Splitting / Breakout Options

In the SN6810-LD, SN6600-LD and SN6600 systems, all ports support splitting according to the following configurations:

Port Speed	Split	Logical Ports	Lane Speed	Signaling
800GbE	N	128	4×224G	PAM4
400GbE	Y	256	2×224G	PAM4

Port Speed	Split	Logical Ports	Lane Speed	Signaling
400GbE	Y	128	4×112G	PAM4
200GbE	Y	512	1×224G	PAM4
200GbE	Y	256	2×112G	PAM4
100GbE	Y	512+2	1×112G	PAM4

The SN6800-LD system supports the following port speeds configurations:

Port Speed	Split	Logical Ports	Lane Speed	Signaling
200GbE	N	2048	2x224G	PAM4
100GbE	N	2048+8	1×112G	PAM4



The SN6800 system does not support additional port breakout modes.

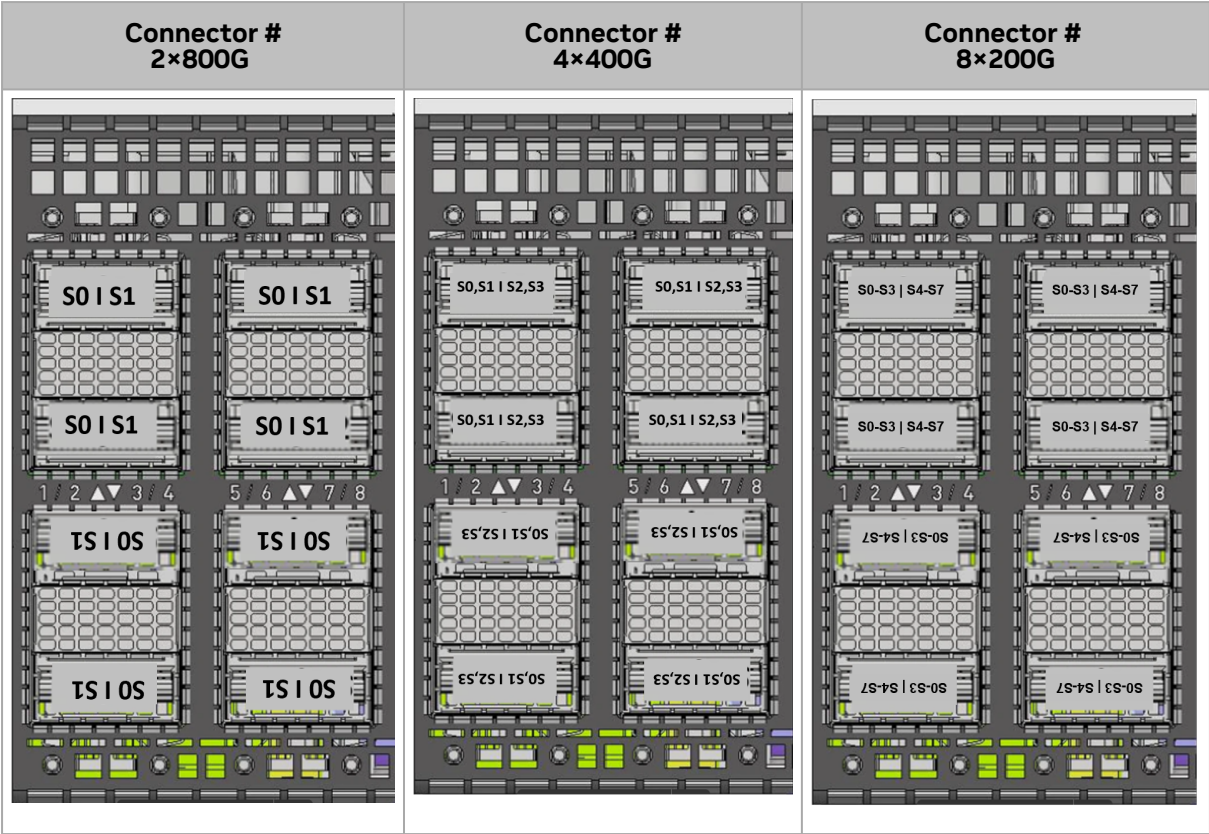
7.5.1.1 Twin 800G Port Allocation

Port Configuration	Physical Connector	NOS Description	Examples
800G + 800G	C1 + C2	swp	swp1, swp2

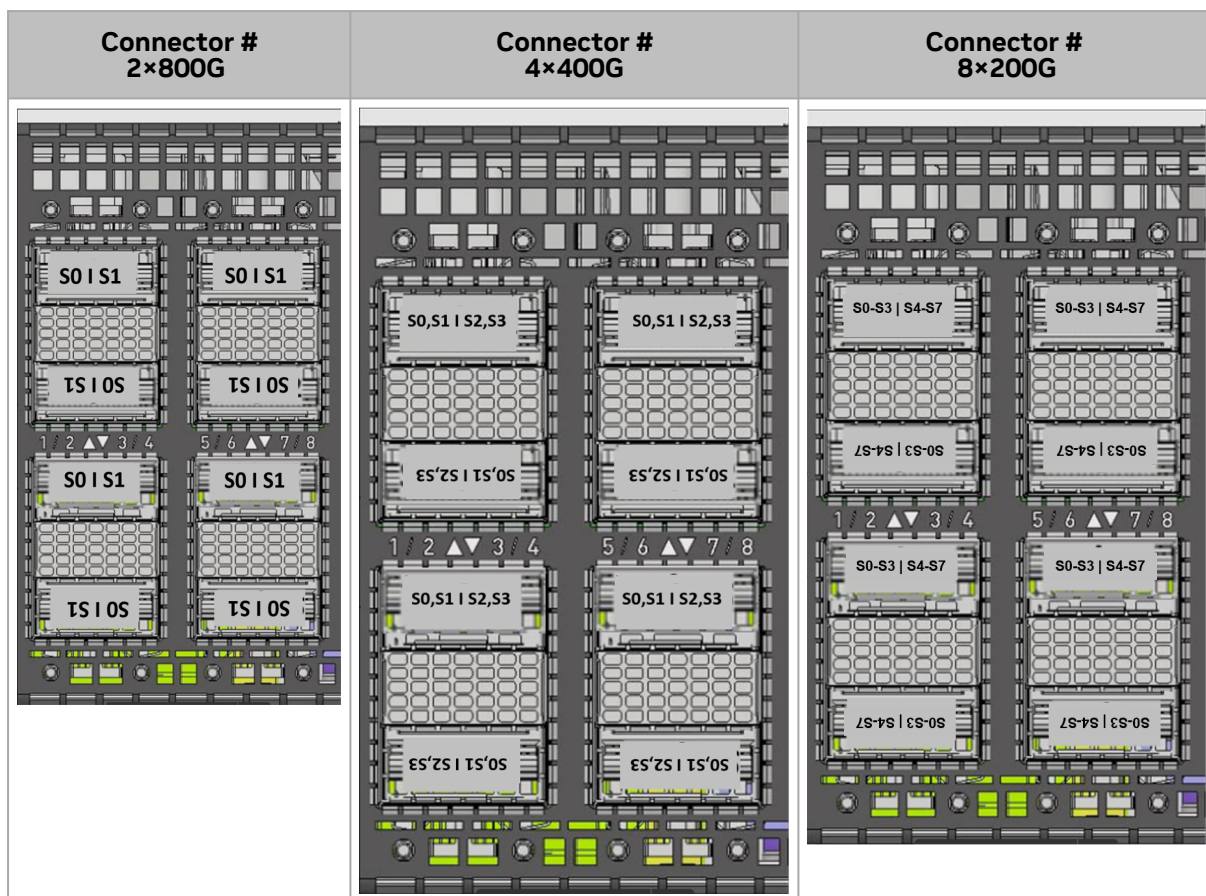
7.5.2 Breakout Ports Reflection in NOS

The illustration below shows the first two rows of the system's OSFP carriers: the image on the left identifies the OSFP cage number as it is presented by the OS; the image on the right identifies the corresponding subinterfaces.

SN6600 Orientation:



SN6600-LD Orientation:



Port Configuration	Physical Connector	Sub-interface	Examples
2×800G	C1	S0	swp1s0, swp24s0
	C2	S1	swp1s1, swp64s1
4×400G	C1	S0, S1	swp2s0, swp2s1
	C2	S2, S3	swp8s2, swp8s3
8×200G	C1	S0, S1, S2, S3	swp60s0, swp60s1, swp60s2, swp60s3
	C2	S4, S5, S6, S7	swp55s4, swp55s5, swp55s6, swp55s7

For additional Information on NVIDIA Interconnect Solution, please refer to: <https://docs.nvidia.com/networking/interconnect/index.html>.

8 Interfaces

The systems support the following interfaces:

- Combined Management and BMC Access RS232 Console Port (RJ45)
- 100/1000M Base-T, Ethernet OOB interface (RJ45)
- 100/1000M Base-T, Ethernet BMC interface (RJ45)
- USB Type A
- Reset button
- Status and port LEDs
- Lane select LEDs and power button

Refer to [Management Interfaces, PSUs, and Fans](#) for full configuration options.

8.1 Speed

Ethernet speed must be set manually. The system's ports can be manually configured to run at a wide range of speeds (for more details, see [Specifications](#)). To change the port speed configuration, refer to [Switch Port Attributes](#).

8.2 RS232 (Console)



The RS232 serial “Console” port is labeled 

The console port is an RS232 serial port on the front side of the chassis that is used for initial configuration and debugging. When you install the system, you must connect a PC to this interface and configure network parameters for remote connections. For complete instructions, refer to [Interface Configuration and Management](#).

8.3 Out-Of-Band Management



The RJ45 management port is labeled 

Out-of-band management port provides an access to the ONIE boot-loader and to the Network Operating System.

The management port is configured with auto-negotiation capabilities by default (full-duplex, 100MbE and 1GbE). 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. For complete instructions, refer to [Interface Configuration and Management](#).



Use only FCC-compliant Ethernet cables.

8.4 Baseboard Management Controller (BMC)



The RJ45 management port is labeled



The BMC management port provides an access to the on-board controller that is running an OpenBMC open-software framework.

The BMC port is configured with auto-negotiation capabilities by default (full-duplex, 100MbE and 1GbE). The management ports' network attributes (such as IP address) must be pre-configured via the RS232 serial console port or by DHCP before use. For further instructions, refer to the NVIDIA Ethernet Switch BMC User Manual (Doc No. 1155052) by logging into [NVOnline](#) or by contacting your NVIDIA representative.

8.5 USB

The USB interface is USB Type-A 2.0-compliant and can be used by the operating system to connect to an external disk for software upgrade or file management.

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.

8.6 Reset Button

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



Do not use a sharp, pointed object such as a needle or a push pin to press the reset button. Use a flat object instead.

For Cumulus Linux password reset instructions, refer to the [Password Recovery](#).

8.7 Status and Port LEDs

See [LED Notifications](#)

8.8 LED Notifications

The system's LEDs are an important tool for hardware event notification and troubleshooting. All figures depicted on this page are for illustration purposes only; the designs may vary slightly between systems.

LED Symbols

Symbol	Name	Description	Normal Conditions
	System Status LED	Shows the health of the system.	Green or flashing green when booting
	Fan Status LED*	Shows the health of the fans.	Green
	Power Supply/Power Distribution Board Status LED	Shows the health of the power supply units.	Green
	Aggregated ELS Status LED	Shows the an aggregated state of all ELS modules.	Green
 Or 	Unit Identifier LED	Lights up on command through the CLI.	Off or blue when activated by the user

*Applies to SN6600 systems only. All other systems in this series are cooled by a liquid cooling mechanism.

8.8.1 System Status LED

The LED illuminated green in the figure below indicates the system's status

Front (Ports Side):





It can take up to five minutes for the booting process to complete. If the System Status LED displays amber after five minutes, unplug the system and contact your NVIDIA representative for assistance.

System Status LED Descriptions

LED	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 booting process to complete.
Solid amber	An error has occurred. For example, corrupted firmware, system is overheated, etc.	If the System Status LED displays amber five minutes after starting the system, refer to Troubleshooting for further instructions.

8.8.2 Fan Status LED



This section applies to the SN6600, AC powered air-cooled switch systems only.

Fan Status LED (Front and Rear Sides)

Both of the LEDs circled below indicate the fans' status.

Front Panel LED:



Rear Panel LED



Fan Status Front LED Assignments

LED	Description	Action Required
Solid green	All fans are up and running	N/A
Solid amber	One or more fans are not operating properly	Replace the faulty FRUs

Fan Status Rear LED Assignments (One LED per Fan)

LED	Description	Action Required
Solid green	A specific fan unit is fully operational	N/A
Solid amber	A specific fan unit is missing or not operating properly	Replace the fan unit



Risk of Electric Shock! Do not insert objects into the fan module cavity.

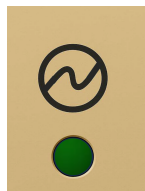
8.8.3 Power Supply/Power Distribution Board Status LEDs



This section applies to the SN6600, AC powered air-cooled switch systems only.

The LEDs below show the power supply/power distribution board status.

Front Panel LED:



Rear Panel LED:



- The SN6600 switch model has eight power supply inlets for redundancy. The system can operate when at least two power supplies are connected. Each power supply unit has two single-color LEDs on the right side of the unit that indicate the status of the unit. When viewing the switch from the FRU side, the first power supply (PS) unit is located on the left side of the system, and the second unit is located on the right side.
- The SN6600-LD, SN6800-LD and SN6810-LD are powered by DC busbars. The LED indicates the status of the busbar's distribution board.

Power Supply Unit/Power Distribution Board 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 operational. If the problem persists, refer to Troubleshooting .

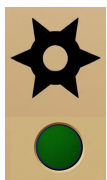
Power Supply Unit/Power Distribution Board Status Rear LED Assignments

LED Behavior	Description	Action Required
Solid green	The PSU is running normally.	N/A
Flashing green 1Hz	AC Present, Standby (On), Main Output (Off)	Refer to Troubleshooting . For further assistance, contact your NVIDIA representative.
Flashing amber 1Hz	PSU warning - events where the PSU continues to operate	
Solid amber	PSU failure (voltage, current, temperature, or fan issue)	
Off	No AC power to all power supplies.	Plug in the AC cord

8.8.4 Aggregated ELS Status LED

The below LED shows the combined status of all ELS modules.

It lights up green when all modules operate normally, and turns amber if one or more ELS modules fails to operate or goes offline, applicable in SN6810-LD and SN6800-LD.



8.8.5 Unit Identification LED

Blue LED that used to allocate a specific switch installed within a rack.

Activating and deactivating the UID LED is done via Network Operating System:

To activate the UID LED on a switch system, use the command:

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

To verify the LED status, use command:

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

To deactivate the UID LED on a switch system, use command:

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

8.8.6 ETH Management Status LEDs

There are two ETH Management LEDs per system. Their behavior indicates link status or activity as follows:

LED Position	LED Behavior	Description
Right LED	Yellow (Steady)	Link Up: A physical connection is established.
	Off	Link Down: No physical connection detected.
Left LED	Green (Blinking)	Activity: Indicates data traffic on the port.
	Green (Slow Blink)	Low Traffic: Blinks approximately once per second.
	Green (Fast Blink)	High Traffic: Blinks regularly several times per second.
	Off	No Activity: No data is currently being transmitted/received.

8.8.7 Port LEDs

The LEDs illuminated green in the figure below indicate the ports' status. The exact location and shape of the ports and their LEDs may vary between systems.

Port LED Indications

State	LED Behavior	Description	Action Required
0	Off	No 8×/4×/2×/1× link was established on this OSFP	N/A

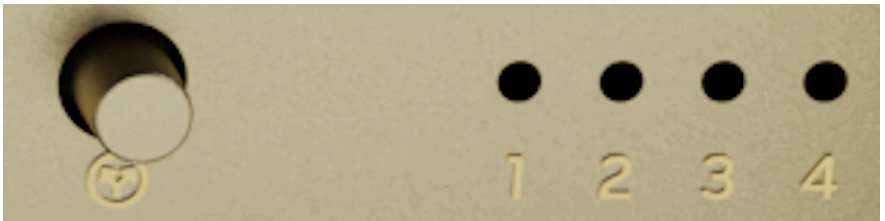
State	LED Behavior	Description	Action Required
	Solid green	At least one link was established: 8×/4×/2×A/2×B/1×A/1×B/1×C/1×D/1×E/1×F/1×G/1×H	
	Flashing green	Traffic is running in linked ports	
	Flashing amber	N/A	
1-8	Off	Link is down	
	Solid green	Link is up with no traffic	
	Flashing green	Link is up with traffic	
	Flashing amber	A problem with the link	

8.8.8 Lane Selector LEDs

Each OSFP can be used as single port (8x - at 100G lanes only) or two 4x ports or four 2x ports;

Each QSFP-DD/OSFP module has one dedicated bi-color LED, the will indicate green light if one or more lane is successfully established a connection.

The LED splitting control button can be used to display link information of the different lanes. The lane select button lets you choose between 8 indication states: press the button to cycle through all 8 states. The current state can be identified by the LED splitting state indication LEDs. The states and their indications are detailed in the table below.

	Lane Select LEDs
LED Splitting Control →	

LED Splitting Options

State	State Indication LEDs [1 / 2 / 3 / 4]	OSFP/QSFP-DD Module LED Indication	Comments
0		Any link is up	See details in the Port LEDs Indications table below, state 0

State	State Indication LEDs [1 /2 /3 /4]	OSFP/QSFP-DD Module LED Indication	Comments
1		8×/4×A/2×A/1×A	• See details in the Port LEDs Indications table below, states 1-8. • Only one of the link types can be up at a given time.
2		8×/4×B/2×B/1×B	
3		8×/2×C/1×C	
4		8×/2×D/1×D	

8.9 Inventory Information

The system's inventory information (such as serial number, part number, and GUID address) can be extracted from the inventory pull-out tab on the system's front panel.



The pull-out tab shown here is for illustration purposes only. The system's specifications on it and its design may slightly vary.

Pull-Out Tab Examples



9 Software Management

The SN6000 series switches are available with the following software options:

- Pre-installed with [NVIDIA Cumulus Linux](#).
- SONiC, an open source network operating system (may not be supported on all switches).

9.1 Software Upgrades

- For Cumulus Linux upgrade instructions, see [Upgrading Cumulus Linux](#).
- For SONiC upgrade instructions, log in to the [NVIDIA Enterprise Support Portal](#), and go to Downloads → Switches and Gateways → Switch Software → SONiC → Documentation.

9.2 Switch Firmware Update

The switch systems do not require firmware updates. Firmware updates are handled through the management software.

10 Troubleshooting

Problem Indicator	Symptoms	Cause and Solution
LEDs	System Status LED is blinking for more than 5 minutes	Cause: The operating system did not boot properly, and only firmware is running. Solution: Connect to the system via the console port, and check the software status. For Cumulus Linux instructions, see Monitoring and Troubleshooting.
	System Status LED is amber	Cause: • Critical system fault (CPU error, bad firmware) • High 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 is blocking the airflow • Replace the fan FRU if needed
	PSU Status LED is amber	Cause: Possible PSU issue Solution: • Check/replace the power cable • Replace the PSU if needed
System boot failure while using Cumulus Linux	Software upgrade failed on x86 based systems	See Monitoring and Troubleshooting .

11 Specifications

11.1 SN6600-LD Specifications

Feature		Value
ASIC	NVIDIA Spectrum-6	
Mechanical	Size:	3.43" (H) × 17.2" (W) × 35.4" (D)* 88mm (H) × 438mm (W) × 900mm (D)* *including UQD and front levers
	Mounting:	19" MGX v1.2 Rack
	Weight:	33 kg
	Speed:	128 ports of 800Gb/s
	Ports Form Factor:	OSFP
Environmental	Temperature:	Operational ambient: 5° to 40°C, ASHRAE A3 Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% to 85% non-condensing
	Altitude:	3050 m
Regulatory	Safety/EMC:	CB, cTUVus, CE, CU, S_Mark, FCC, VCCI, ICES, RCM, BSMI, KCC, CQC
	RoHS:	RoHS compliant
Cooling	Liquid Cooling	See Liquid Cooling Specifications .
Power	Input Voltage:	48VDC (range 40VDC to 60VDC)
	Global Power Consumption:	Typical power with FRO (Fully Retimed Optics): 3.3KW Typical power with TRO (Transmit Retimed Optics): 2.79KW
Main Devices	CPU:	8-core x86 Processor
	PCIe:	Gen4 x4
	RAM:	32G DDR5
	Storage:	80GB NVMe SSD
Lanes per OSFP/MMC-16		8x 200G PAM4
Packet buffer		256 MB
Throughput		102.4 Tbps

11.2 SN6600 Specifications

Feature		Value
ASIC	NVIDIA Spectrum-6	
Mechanical	Size:	5.25" (H) × 17.2" (W) × 30.1" (D) 133.35mm (H) × 438mm (W) × 767mm (D)
	Mounting:	19" EIA Rack
	Weight:	52kg

Feature		Value
	Speed:	128 ports of 800Gb/s
	Ports Form Factor:	OSFP
Environmental	Temperature:	Operational: 0° to 35°C, ASHRAE A3 Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% to 85% non-condensing
	Altitude:	3050 m
Regulatory	Safety/EMC:	CB, cTUVus, CE, CU, S_Mark, FCC, VCCI, ICES, RCM, BSMI, KCC, CQC
	RoHS:	RoHS compliant
Cooling	Air-Cooling	Connector to Power, Port side intake 5 Fans, N+1 Redundant
Power	Input Voltage:	200-240 VAC
	Global Power Consumption:	Typical power with FRO (Fully Retimed Optics): 3.94KW Typical power with TRO (Transmit Retimed Optics): 3.2KW
Main Devices	CPU:	8-core x86 Processor
	PCIe:	Gen4 x4
	RAM:	32G DDR5
	Storage:	80GB NVMe SSD
Throughput		102.4 Tbps

11.2.1 SN6810-LD Specifications

Feature		Value
ASIC	NVIDIA Spectrum-6	
Mechanical	Size:	3.43" (H) × 17.2" (W) × 35.4" (D)* 87mm (H) × 438mm (W) × 900mm (D)* *including UQD and front levers
	Mounting:	19" MGX v1.2 Rack
	Weight:	32.5 kg
	Speed:	128 ports of 800Gb/s
	Ports Form-Factor	MMC-16
Environmental	Temperature:	Operational ambient: 5° to 40°C, ASHRAE A3 Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% to 85% non-condensing
	Altitude:	3050 m
Regulatory	Safety/EMC:	CB, cTUVus, CE, CU, S_Mark, FCC, VCCI, ICES, RCM, BSMI, KCC, CQC
	RoHS:	RoHS compliant
Cooling	Liquid Cooling	See Liquid Cooling Specifications .

Feature		Value
Power	Input Voltage:	48VDC (range 40VDC to 60VDC)
	Global Power Consumption:	Typical power: 1.96kW Max Power: 2.2KW
Main Devices	CPU:	8-core x86, AMD
	PCIe:	Gen3 x4
	Switch:	NVIDIA Spectrum-6
	RAM	32GB RAM DDR5
	Storage	80GB NVMe SSD
Lanes per OSFP/MMC-16		4x 200G PAM4
Packet buffer		256 MB
Throughput		102.4 Tbps

11.2.2 SN6800-LD Specifications

Feature		Value
ASIC	4x NVIDIA Spectrum-6	
Mechanical	Size:	8.75" (H) × 17.2" (W) × 35.4" (D)* 220mm (H) × 438mm (W) × 900mm (D)* *including UQD and front levers
	Mounting:	19" MGX v1.2 Rack
	Weight:	95 kg
	Speed:	2048 ports of 200Gb/s
	Ports Form-Factor	MMC-16
Environmental	Temperature:	Operational ambient: 5° to 40°C, ASHRAE A3 Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% to 85% non-condensing
	Altitude:	3050 m
Regulatory	Safety/EMC:	CB, cTUVus, CE, CU, S_Mark, FCC, VCCI, ICES, RCM, BSMI, KCC, CQC
	RoHS:	RoHS compliant
Cooling	Liquid Cooling	See Liquid Cooling Specifications .
Power	Input Voltage:	48VDC (range 40VDC to 60VDC)
	Global Power Consumption:	Typical power: 8.3kW Max Power: 10.5KW
Main Devices	CPU:	16-core x86 Processor
	PCIe:	Gen4 x4
	RAM:	96G DDR5
	Storage:	160GB NVMe SSD

Feature	Value
Lanes per OSFP/MMC-16	4x 200G PAM4
Packet buffer	4x 256 MB
Throughput	409.6 Tbps

12 Appendixes

This document contains the following appendixes:

- [Management Interface Specifications](#)
- [Accessory and Replacement Parts](#)
- [ELS Replacement Procedure for SN6810-LD and SN6800-LD Switch Systems](#)
- [Liquid Cooling Specifications](#)
- [Thermal Threshold Definitions](#)
- [System Disassembly, Disposal, and RMA Instructions](#)

12.1 Management Interface Specifications

12.1.1 Serial Console

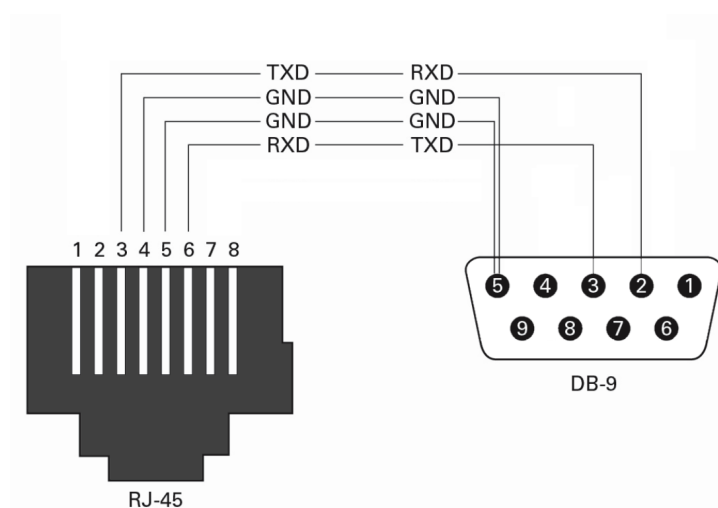
NVIDIA switches include RJ-45 RS-232 console port.

To use the Console port, connect the supplied RJ-45-to DB-9 harness provided with the switch to the PC serial port. Connect the RJ-45 end of the cable to the console port of the switch.

Configure the terminal application/emulation program to 115,200 baud, 8 data bits, no parity, 1 stop bit.

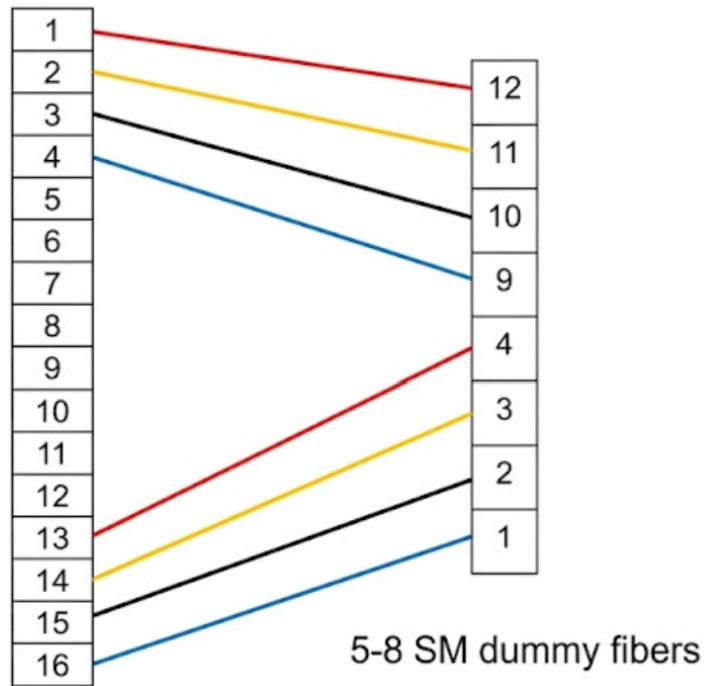
Switch CLI login should be available for switch configuration.

RJ-45 to DB-9 Harness Pinout

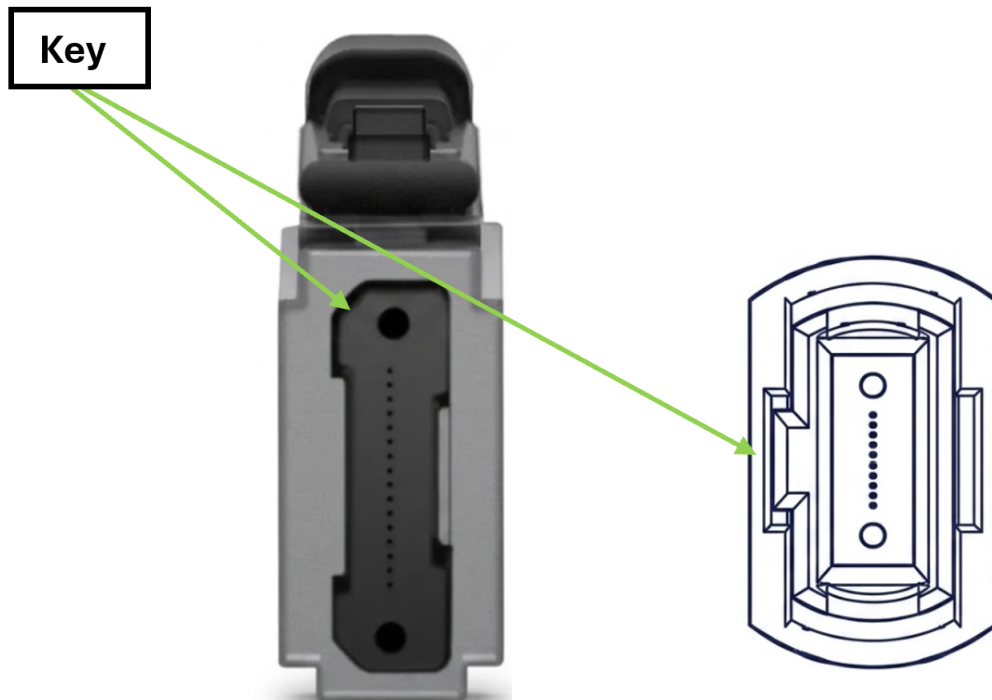


12.1.2 MMC-MPO Pinout Mapping

The following schematic details the pinout mapping and fiber assignment between a 16-position MMC connector and a 12-position MPO connector, along with physical key orientation for alignment.



5-12 SM dummy fibers



12.1.3 Out-of-Band Management Interface

Out of Band is a management network that aggregates all networking switches enabling access for their configuration, management and monitoring.

NVIDIA switch has an OOB Ethernet port, an RJ-45 based with 1Gbase-T speed, supporting up to 100m using standard Cat-5/Cat-6 twisted pairs cabling.

12.1.4 BMC Management Interface

NVIDIA switch has a standard Ethernet port to connect to the *Baseboard Management Controller*, a 1Gbase-T port, up to 100m using Cat-5/Cat-6 twisted per with RJ-45 connector.

12.1.5 USB Standard Specifications

For USB specification documents, refer to the [USB Document Library](#).

12.2 Accessory and Replacement Parts

Ordering Part Numbers for Replacement Parts

Part Type	Part Number	Description	Supported Systems
Rack Mounting Kit	930-9SKIT-00 LO-00F	NVIDIA Rail Kit for SN6600-LD, SN6810-LD	SN6600-LD, SN6810-LD
	930-9SKIT-00 LO-00G	NVIDIA Rail-Kit for SN6600	SN6600
	930-9SRKT-00 FO-00C	NVIDIA Rail Kit for SN6800-LD	SN6800-LD
External Laser Source	930-9IAWO-00 K00	NVIDIA External Laser Source	SN6810-LD and SN6800-LD
Silicone Photonics Switch Cleaning Kit	930-9SECK-00 NA-00A	NVIDIA cleaning kit and extraction tool for SN6810-LD and SN6800-LD silicone photonics switches	SN6810-LD and SN6800-LD
Fan Modules	930-9SFAN-00 RM-00I	NVIDIA fan unit, Connector-to-Power airflow, SN6600 switch	SN6600
Power Supplies	930-9SPSU-0 ORM-00I	NVIDIA AC Power-Supply Unit, 2.7KW, Connector-to-Power airflow, SN6600 switch	SN6600
Power Cords	930-9SPWC-0 OA-00I	NVIDIA black power cord 250V, 16A 2000MM C19 to C20	SN6600
RS-232 Serial Console Cable	HAR000631	RS-232 cable, DB9 to RJ45 2M harness 2M	SN6600, SN6600-LD, SN6800-LD, SN6810-LD

12.3 ELS Replacement Procedure for SN6810-LD and SN6800-LD Switch Systems

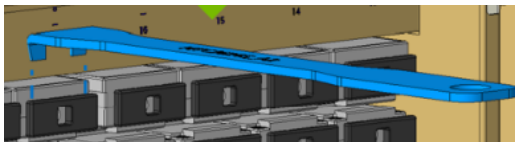
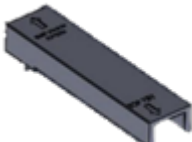
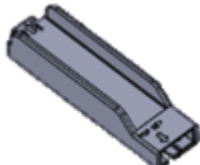
12.3.1 Introduction

This document describes the guidelines for inspection, cleaning, and replacement of the External Laser Source (ELS) modules and ELSFP connectors during debug or replacement procedures for the SN6810-LD systems.



For Engineering Sample (ES) hardware, field replacement of the ELS is restricted to certified NVIDIA Support engineering staff only. Do not attempt self-service replacement on ES hardware.

12.3.2 Required Equipment and Tools

Part Number	Description	Illustration
MTCJ6245	ELS module Extraction Tool	
SCK-SS-ELSFP-03-BODY	ELSFP Cleaner for Fiber Optic Connectors (Detachable Head)	
SCK-SS-ELSFP-GUIDE-M-03-P02	ELSFP Guide for ELS Module	
SCK-SS-ELSFP-GUIDE-C-03-P02	ELSFP Guide for ELS Cage	



The Cleaning kit is available from NVIDIA, see spare parts chapter for more information.

12.3.3 ELS Module Replacement Instructions

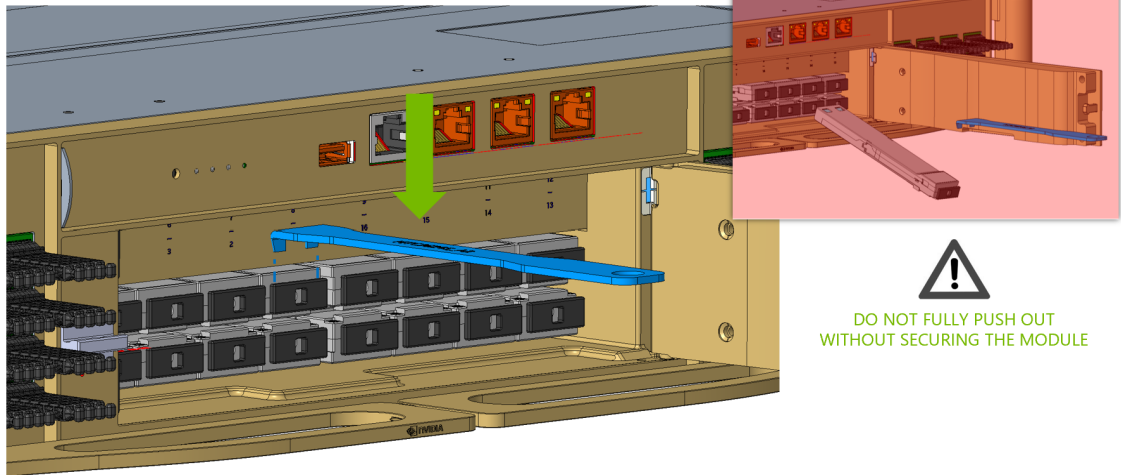
12.3.3.1 Disassembly

1. Press the highlighted area to open the access door.



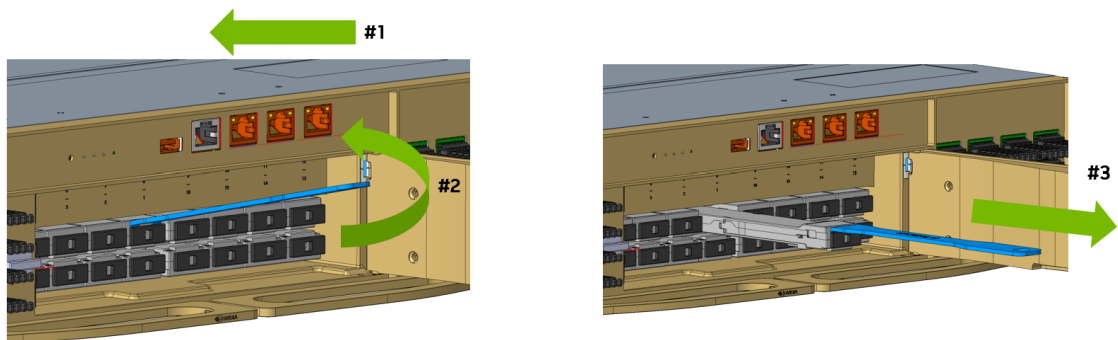
2.

Install the extraction jig (MTCJ6245) onto the ELS module.



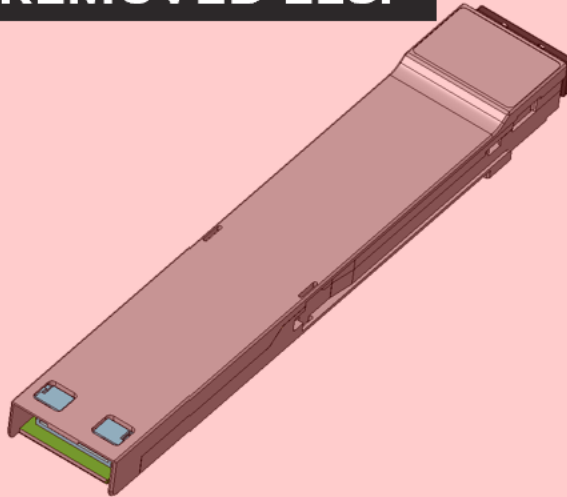
12.3.3.2 Module Removal

1. Gently push the ELS module inward.
2. While maintaining inward pressure, slightly lift the extraction jig to release the latch.
3. Carefully pull the ELS module completely out of the cage.



4. Install the dust cover on the removed ELS module.

REMOVED ELS:



Do not leave a running system unplugged from the ELS module for longer than 30 minutes.

12.3.3.3 New ELS Module Assembly

Remove the dust cover from the replacement ELS module.



12.3.3.4 New ELS Module Cleaning

1. Prepare the ELSFP cage adapter (SCK-SS-ELSFP-GUIDE-C-03-P02) and cleaning tool (SCK-SS-ELSFP-03-BODY).



SCK-SS-ELSFP-03-BODY

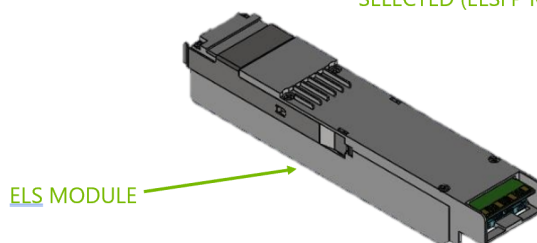


SCK-SS-ELSFP-GUIDE-M-03-P02

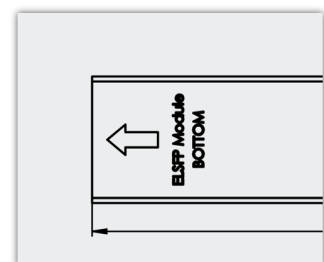
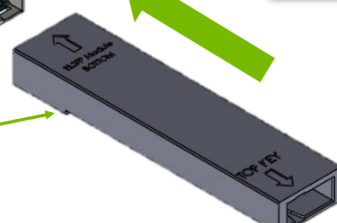
2. Insert the ELSFP cage adapter (SCK-SS-ELSFP-GUIDE-C-03-P02) into the ELS cage.



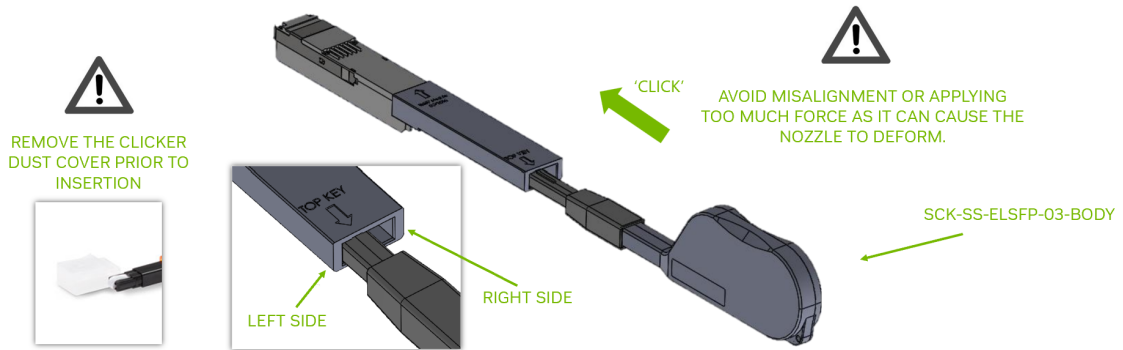
ENSURE THE CORRECT ADAPTER IS
SELECTED (ELSFP MODULE)



SCK-SS-ELSFP-GUIDE-M-03-P02



3. Remove the dust cover from the cleaning tool (clicker, SCK-SS-ELSFP-03-BODY).
4. Insert the cleaning tool (SCK-SS-ELSFP-03-BODY) nozzle using an alignment key.
5. Carefully push the cleaning tool in the direction shown until an audible click is heard. One complete insertion-and-release cycle is sufficient.
6. Reinsert the cleaner to the right side of the adapter as shown in the above illustration, and repeat Steps 4–5.



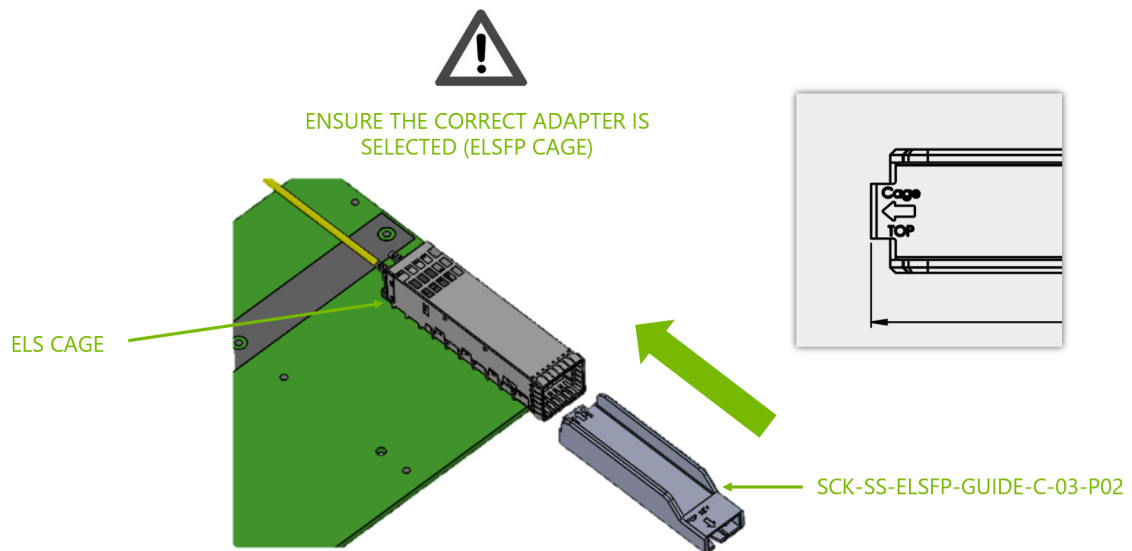
7. Remove the cleaning tool and adapter from the cage.
8. Assemble the dust cover back on the cleaning tool.

12.3.3.5 ELS Cage Cleaning

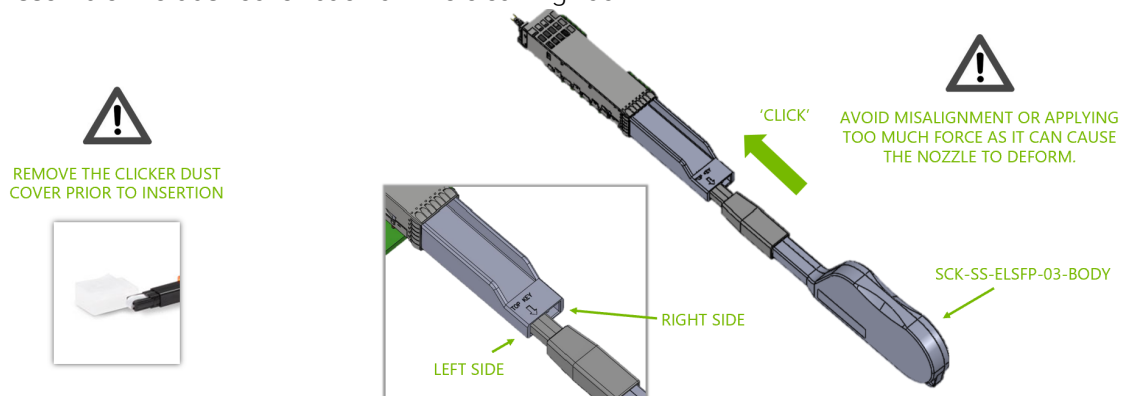
1. Prepare the ELSFP cage adapter (SCK-SS-ELSFP-GUIDE-C-03-P02) and cleaning tool (SCK-SS-ELSFP-03-BODY).



2. Insert the ELSFP cage adapter (SCK-SS-ELSFP-GUIDE-C-03-P02) into the ELS cage.



3. Remove the dust cover from the cleaning tool (clicker, SCK-SS-ELSFP-03-BODY).
4. Insert the cleaning tool (SCK-SS-ELSFP-03-BODY) nozzle using an alignment key.
5. Carefully push the cleaning tool in the direction shown until an audible click is heard. One complete insertion-and-release cycle is sufficient.
6. Reinsert the cleaner to the right side of the adapter as shown in the above illustration, and repeat Steps 4-5.
7. Remove the cleaning tool and adapter from the cage.
8. Assemble the dust cover back on the cleaning tool.



12.3.3.6 New Module Assembly

Align and gently slide the new ELS module into its slot until it is fully seated.



12.4 Liquid Cooling Specifications

Parameter	SN6600-LD	SN6810-LD	SN6800-LD
Liquid coolant	Recochem PG-25%	Recochem PG-25%	Recochem PG-25%
	Propylene-glycol based heat transfer fluid.	Propylene-glycol based heat transfer fluid.	Propylene-glycol based heat transfer fluid.
Working pressure	5 [Bar]	5 [Bar]	5 [Bar]
Outburst pressure	15 [Bar]	15 [Bar]	15 [Bar]
Universal Quick Disconnects	UQD8 v2	UQD8 v2	UQD8 v2
Design	Open-loop design	Open-loop design	Open-loop design
UQD Couplers	1 Cold + 1 Hot per switch	2 Cold + 2 Hot per switch	5 Cold + 5 Hot per switch
Liquid Flow rate per system	5.7 [lpm]	3.5 [lpm]	13.5 [lpm]
Pressure drop	16.5 [PSI]	16.5 [PSI]	16.5 [PSI]
Max liquid supply temperature	+45°C	+45°C	+45°C
Min liquid supply temperature	+17°C	+17°C	+17°C



The Liquid Flow Rate should be multiplied according to the number of switches per rack.

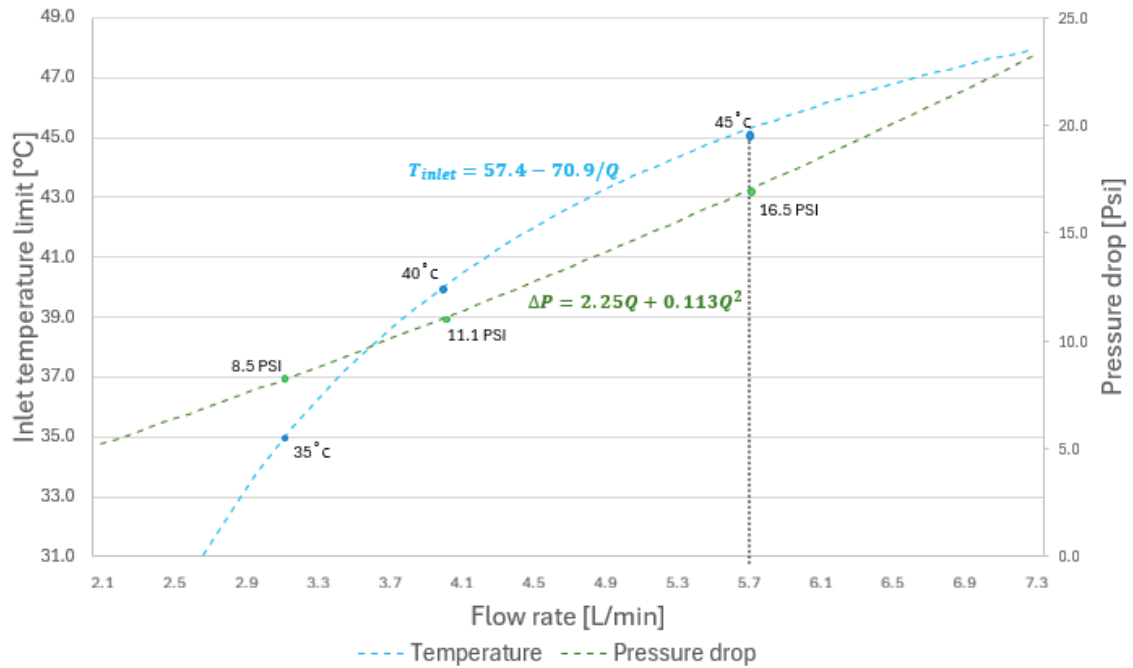


Pressure drop remains constant across all rack elevations.

12.4.1 Pressure-Quantity Curves

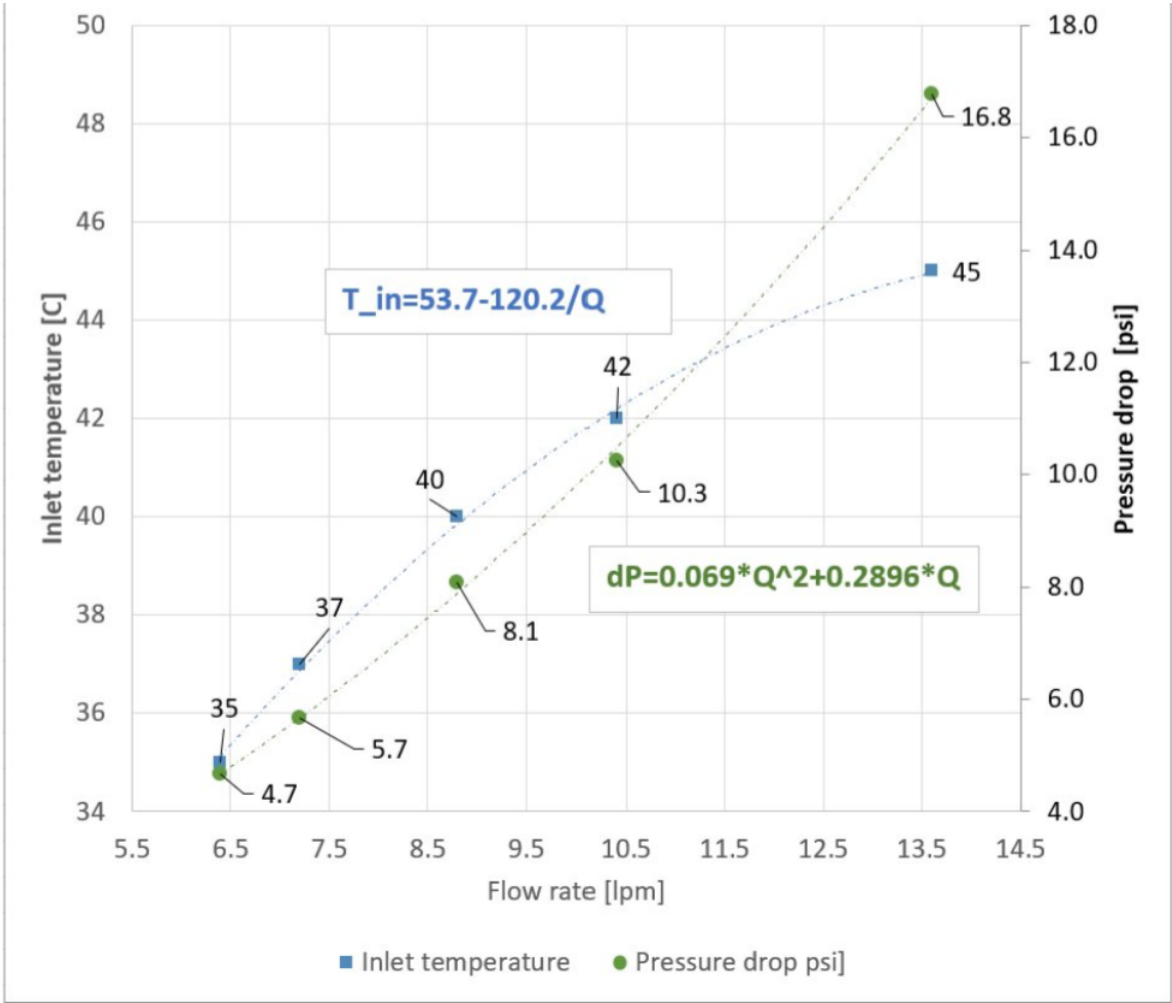
Liquid Cooling Systems P-Q Curve

SN6600-LD:



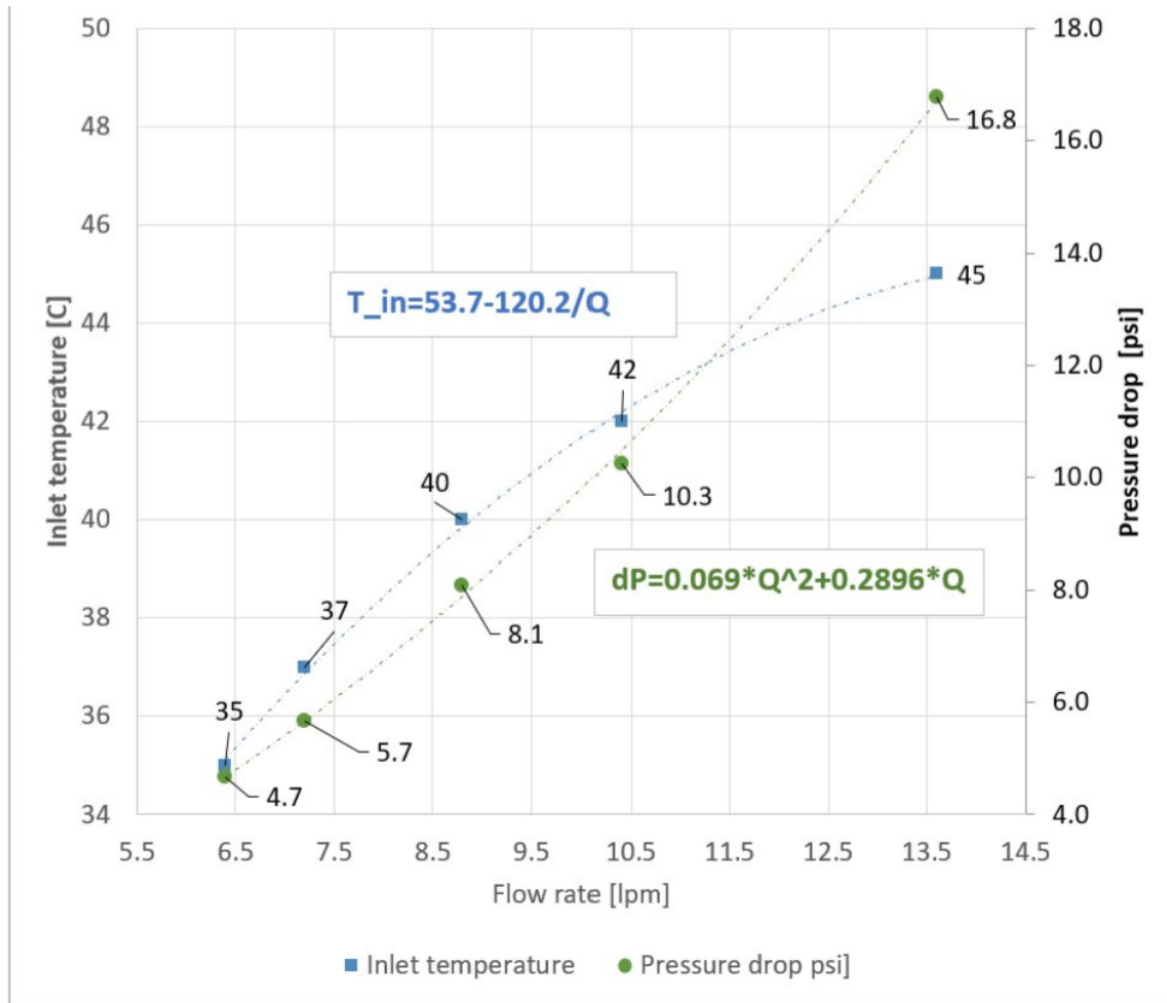
Liquid Cooling Systems P-Q Curve

SN6810-LD:



Liquid Cooling Systems P-Q Curve

SN6800-LD:



12.5 Thermal Threshold Definitions

Three thermal threshold definitions are measured by the systems' ASICs. They impact the overall switch system operational state as follows:

ASIC Temperature	Status	System Behavior
Up to 99°C	Normal	Standard operating conditions
100°C – 109°C	High temperature warning	The ASIC has reached a high operating temperature, performance may degrade
110°C – 119°C	ASIC critical temperature exceeded	Firmware driven ASIC shutdown
120°C and above	Critical over-temperature	Hardware driven ASIC shutdown

12.6 System Disassembly, Disposal, and RMA Instructions

12.6.1 Disassembly Procedure AC Powered Switch

To disassemble the system from the rack:

1. Unplug and remove all Optic Fibers, Copper Cables, management cables
2. Unplug all power cords.
3. Unscrew the Switch from the brackets and rails.
4. Slide the system from the rack.



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

12.6.2 RMA for Liquid Cooled Systems

12.6.2.1 Scope

The following instructions apply to the SN6600-LD and SN6810-LD switch systems being returned for Return Merchandise Authorization (RMA) after operation with a Cooling Distribution Unit (CDU). The SN6600-LD is a 100% liquid-cooled switch utilizing UQD08 inlet/outlet connections and PG-25 coolant.

12.6.2.2 Pre-Shipment and General Handling Instructions

12.6.2.2.1 System Disassembly

1. Power Down and Disconnect: Shut down the switch according to standard system shutdown procedures and carefully remove it from the rack.
2. Weight and Safety Caution: Support the system weight during rack removal.



Heavy Equipment Hazard

- SN6600-LD Weight: 33 kg
- SN6810-LD Weight: 32.5 kg

Due to the weight of these systems, always use two people or suitable mechanical lifting equipment to move or install them.

12.6.2.2.2 Packaging Safety and Care

- Rubber Protective Caps: It is strongly recommended to retain and reuse the original UQD rubber caps provided with the switch during RMA preparation.

- **Mechanical Protection:** Repackage the switch with care. Ensure no external pressure or load is applied to the UQDs or Busbar, as this can cause permanent physical damage.

12.6.2.3 Shipping Methods Overview

Do NOT ship the switch fully filled with both UQD08 connections independently capped/sealed. A fully filled, sealed cooling loop is highly sensitive to temperature variations during transport and storage; thermal expansion of the coolant increases internal pressure and can deform or damage cooling components.

Choose one of the following methods:

12.6.2.3.1 Method A — Partially Drained Shipment

If a suitable wet-shipment expansion hose cannot be installed, partially drain the SN6600-LD cooling loop. One UQD should be used for draining while the second UQD is opened as a vent. The loop can be drained by gravity or pumping.



CAUTION: Chemical Fluid Handling and Disposal

The coolant (PG-25) is a chemical corrosive fluid. when handled it requires wearing safety goggles and gloves.

The Coolant must be collected carefully during the draining procedure.

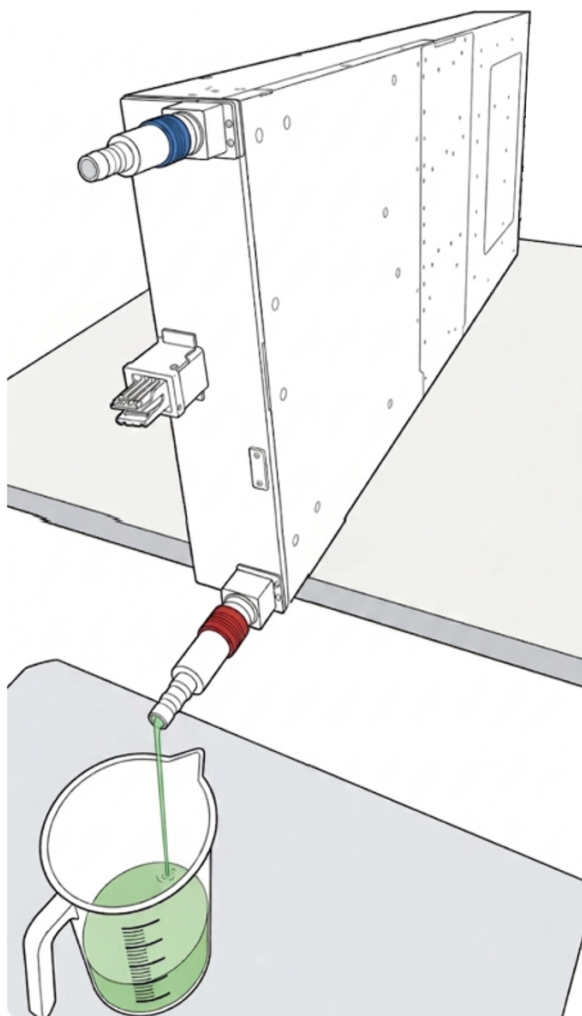
Do NOT dispose of coolant in regular waste or municipal sewage systems. Dispose of the fluid in strict compliance with domestic standards, local environmental laws, and WEEE Directive 2002/96/EC.

12.6.2.3.1.1 Reference Adapter Part Numbers:

- Danfoss 155-2335-000 (Blue)
- Danfoss 155-2336-000 (Red)

12.6.2.3.1.2 Procedure

1. Disconnect the switch from the CDU.
2. Connect a drain hose using a reference adapter to one UQD08 port.
3. Connect an open-ended hose with UQD08 to allow air vent.
4. For SN6600-LD systems only: Position the switch vertically to facilitate gravity draining.
5. Allow a minimum of **156 ml** to drain from the SN6600-LD (representing 50% of the total cooling loop capacity). Alternatively, an approved pump can be used.



6. Disconnect drainage equipment.
7. Reinstall the protective UQD rubber caps/covers before packaging to prevent port contamination and transit damage.
8. Inspect the unit thoroughly for external leaks before sealing the shipping box.

12.6.2.3.1.3 Shipping Conditions

- Temperature Range: +5°C and +60°C (41°F to 140°F).
- Transit Time: Must arrive at the NVIDIA RMA facility within 45 days maximum.



Due to its weight (~95 kg), tilting and positioning the SN6800-LD system vertically is not applicable.

12.6.2.3.2 Method B — Wet Shipment with Expansion Hose (Recommended)

This method is recommended when an approved expansion hose is available. The hose provides the necessary additional volume for coolant expansion during transport and storage. NVIDIA will provide the expansion hose part number and specifications for customer purchase once available.

12.6.2.3.2.1 Procedure

1. Disconnect the switch from the CDU.
2. Connect the approved service/transport expansion hose between the UQD08 inlet and UQD08 outlet.
3. Verify that both UQD connections are fully engaged and locked.
4. Inspect the complete cooling loop and expansion hose for any visible leakage.
5. Ensure the hose is mechanically secured so it cannot pull on or strain the UQD connectors during transit.
6. Protect the UQD assemblies and hose from mechanical impact during packaging.



12.6.2.3.2.2 Shipping Conditions

- Temperature Range: 5°C to 60°C.
- Transit Time: Must arrive at the NVIDIA RMA facility within 45 days maximum.

12.6.2.4 Pre-Shipment Checklist and Packaging Record

12.6.2.4.1 Final Pre-Shipment Inspection

Before closing the RMA packaging, verify and check off the following:

- ☐ No visible external coolant leakage.
- ☐ UQD08 and Busbar interfaces mechanically protected against external pressure/impact.
- ☐ Protective UQD rubber covers installed (*Method A only*).
- ☐ Expansion hose installed and secured (*Method B only*).
- ☐ Cooling preparation method recorded in RMA case documentation.
- ☐ Approximate drained coolant volume recorded (*Method A only*).

The RMA package should be marked as containing a liquid-cooled system, and the RMA record should indicate which cooling preparation method was used:

Cooling Condition:
☐ Wet – Expansion Hose Installed
☐ Partially Drained – ____ ml Removed



12.6.3 System 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.

12.6.3.1 Lithium Battery

If the product's real-time clock includes a lithium coin battery (CR2032), be noted that it contains perchlorate. When replacing the battery, use only a replacement battery that is recommended by the equipment manufacturer.

- ✗ The battery can explode if not properly used, replaced, or disposed of. Dispose of the battery according to your local regulations. Do not attempt to recharge the battery, disassemble, puncture, or otherwise damage it.

13 Document Revision History

Date	Revision	Description
September 2026	1.3	Updated: • SN6600 Rail Kit • SN6800-LD Rail Kit • SN6600-LD/SN6810-LD Rail Kit • Interfaces
August 2026	1.2	Updated: • Accessory and Replacement Parts • ELS Replacement Procedure for SN6810-LD Systems • SN6600 Front and Rear View in System Disassembly, Disposal, and RMA Instructions
July 2026	1.1	Added: • ELS Replacement Procedure for SN6810-LD Systems Updated: • SN6600 Front and Rear View in Introduction • Package Contents • SN6800-LD Rail Kit • NVIDIA Interconnect for Spectrum-6 Based Ethernet Switches • Management Interface Specifications
May 2026	1.0	Preliminary version

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