



# NVIDIA QUANTUM CS8500 MODULAR SWITCH SERIES

Increase Data Center Availability with 200G InfiniBand Smart Switches



Delivering modular, high-availability design and performance for HPC, AI, cloud, and hyperscale data centers

Today’s rapid data growth, real-time data processing, and mission-critical application environments fuel demand for faster, more efficient interconnect solutions. The high-density NVIDIA Quantum CS8500 switch provides up to 800 ports of 200 gigabits per second (Gb/s) InfiniBand connectivity, enabling high throughput, availability, and scalability.

## The Era of Data-Driven Computing

Complex research demands ultra-fast processing of high-resolution simulations, extreme-size datasets, and complex, highly parallelized algorithms that need to exchange information in real time. The CS8500 provides a high performance fabric solution in a 29U form factor, delivering 320 terabits per second (Tb/s) of full bi-directional bandwidth with ultra-low port latency. CS8500 switches create extremely high scalability for large data aggregation, with the highest application performance of complex computations while data moves through the data center network.

The NVIDIA® Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™ technology takes advantage of all active data center devices to accelerate the communications frameworks, resulting in an order-of-magnitude improvement in application performance. Enabling efficient computing, the CS8500 leverages such features as adaptive routing, congestion control, and quality of service, ensuring the maximum effective network bandwidth by eliminating a variety of congestion hot spots.

## World-Class Design

The modular CS8500 chassis switch is designed for performance, serviceability, energy efficiency, and high availability. Providing an excellent price-performance ratio for medium- to extremely large-size clusters, the CS8500 features the reliability and manageability expected from a modular-class switch. The leaf blades, spine blades, management modules, power supplies, and fan units are all hot-swappable to help eliminate downtime.

As an eco-friendly solution, the CS8500 is cooled solely by a liquid closed loop to enable a low noise level and reduce infrastructure opex. It arrives with a liquid coolant distribution unit (CDU) or air heat exchanger (AHX) data units to best fit all data centers. NVIDIA Quantum 200Gb/s switches are backwards compatible to previous generations and include extensive software ecosystem support.

### SYSTEM SPECIFICATIONS

Performance	<b>800 200Gb/s ports 1,600 100Gb/s ports (200Gb/s split-port mode)</b>
Switch radix	<b>320Tb/s aggregate switch throughput</b>
Connectors and cabling	<b>QSFP56 connectors, passive copper or active fiber cables; optical modules</b>
Power supply	<b>N+N redundant and hot-swappable power supplies Input range: 200-240Vac 80+ Platinum and Energy Star certified power supplies</b>
Cooling	<b>Liquid-cooled</b> > Liquid-to-air AHX > Liquid-to-liquid CDU
Management modules	<b>Two available (one required for operation) SSH, Telnet, Web, SNMP, and XML</b>
Fabric management	<b>On-board subnet manager supports fabrics with 2,000 nodes UFM agent</b>
CPU	<b>x86 ComEx Broadwell CPU</b>
Software	<b>MLNX-OS</b>
System weight	<b>Weight:</b> > 747kg for full CDU-based configuration > 910kg for full AHX-based configuration
System dimensions (H x D x W)	<b>1,289mm x 770mm x 483mm</b>
EMB (emissions)	<b>CE, FCC, VCCI, ICES, RCM</b>

## Streamlining Network Design and Topologies

By implementing NVIDIA port-split technology, the CS8500 switch provides a double-density radix for 100Gb/s data speeds, reducing the cost of network design and network topologies. Supporting up to 1,600 100Gb/s ports, CS8500 is an ultra-dense chassis switch perfect for medium-to-large deployments that require lower power, latency, and space.

## Collective Communication Acceleration

The NVIDIA Quantum switch improves the performance of selected collective operations by processing data as it traverses the network, eliminating the need to send data multiple times between endpoints. It also supports the aggregation of large data vectors at wire speed to enable Message Passing Interface (MPI) large vector reduction operations, which are crucial for machine learning applications.

## Enhanced Management

The CS8500 switch comes with NVIDIA MLNX-OS chassis management software. It delivers a complete and familiar chassis management experience, including configuration and monitoring of power supplies, fans, and ports. It also ensures interoperability with the previous generation of NVIDIA InfiniBand switch systems. MLNX-OS supports full chassis management through command-line interface (CLI), web-based user (WebUI), Simple Network Management Protocol (SNMP), or JavaScript Object Notation (JSON) interfaces.

For best-in-class data center networking management, including for the CS8500, the advanced NVIDIA Unified Fabric Manager (UFM®) platform combines enhanced, real-time network telemetry with AI-powered cyber intelligence and analytics.

Operating Conditions	<b>Temperature:</b> > Operating: 0°–40°C > Non-operating: -40°–70°C <b>Humidity:</b> > Operating: 10%–85% non-condensing <b>Altitude: Up to 3,050m</b>
Product safety compliant/certified	<b>RoHS compliant, CB, cTUVus, CE, CU</b>
Warranty	<b>One-year hardware warranty and five-year service fee (mandatory)</b>

## Ordering Information

For ordering information, please contact [gopny@pny.com](mailto:gopny@pny.com)

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