



# Nebula G2™

## 2U 24 PCIe Gen4 U.2 NVMe Expansion Storage System



Nebula G2 is a PCIe Gen4 NVMe-based, all flash array product in a single 2U enclosure. Supporting up to 24 U.2 dual port NVMe drives, our Nebula G2 platform delivers PCIe Gen4 end-to-end with outstanding performance, low latency, resource sharing and high availability.

### Ultra-Fast NVMe JBOF

In 2016, Celestica announced the original Nebula platform, the industry's first storage expansion enclosure (JBOF) using ultra-fast NVMe SSDs. Keeping pace with the rapidly expanding Flash market, we are pleased to introduce the Nebula G2 hardware platform solution, featuring 24 U.2 PCIe Gen4 NVMe SSDs in a 2U storage enclosure. Its extremely high performance makes it ideal for applications that require low latency and high data rates.

### High Availability Solution

Nebula G2 features 24 PCIe Gen4 NVMe drives with dual redundant PCIe-based expansion modules, power supplies and an HBA (host bus adapter) for connection to the host. It provides redundant data access to all of the hot swappable drives and includes redundant hot swappable power supplies.

### Out-of-Box Capacity at In-the-Box Speed

NVMe-based SSDs represent the latest emerging solid state storage technology. NVMe is based upon Flash technology, which utilizes PCIe, the same ultra-high speed interface that communicates directly with the CPUs in all servers. Combining NAND Flash with a high-speed interface virtually eliminates latency between the storage enclosure and processor, resulting in extremely high performance. Applications such as OLTP (on-line transaction processing) where low latency is a must, gain significant performance advantages.

### Queue Depth

NVMe is architected to provide significantly greater number of queues than SAS Architecture. Achieving up to 65,000 queues and 65,000 command queue depths are possible.

### No Waiting for SAS Interfaces

Traditional enclosures have relied on HDD technology for their storage expansion capabilities, limiting data rates to roughly 3Gbps. This results in milliseconds of latency delay waiting for the media to spin under the head.

With HDDs, the latency delay from SAS was tolerable, however, with SSD transfer rates, these latencies are unacceptable. Using NVMe avoids complexity and software overhead from the SCSI protocol.

### High Reliability

Nebula G2 is based on an existing high-reliability 2U platform that has been in use for several years, with a field population of more than 500,000 units. Adapting the existing solution enables Celestica to deliver lower total cost with faster time to market. Broadcom, the leading supplier of PCIe switch and SAS technology, worked jointly with Celestica to develop the Nebula G2 solution, delivering yet another leading-edge Storage technology. Early access customers have reported revolutionary performance gains using the Nebula G2 platform.



**Enterprise-Class Quality. Cloud Economics.**

## FEATURES

All flash array, NVMe technology

2U height, rack mount

JBOF supports up to 24 U.2 NVMe SSDs

- 16Gbps PCIe Gen4
- Dual port, x2 + x2 PCIe lanes for each SSD
- Enclosure Management
- In-band Management Interface
- Enclosure Health Monitor
- Enclosure Cooling Control
- System Event Log
- On-line Firmware Update
- SSD Hot-Plug Management
- Domain Configuration
- Support Redfish with BMC management

Dual Expansion Storage Module (ESM) to support 1+1 redundant

- 2 pass through cards on each ESM, 4 MiniSAS HD ports per card

Supports hot-swappable ESMs, PSUs and SSDs

Supports LED indicators and rail kits

## POWER AND COOLING

900W, 80 plus platinum, 1+1 redundant, hot swap

PSU 89-264V AC input, auto ranging, 47~63Hz

Four 40 mm high performance fan modules integrated in each PSU, front to rear system cooling

Fan speed controlled by system software

## PHYSICAL DIMENSIONS

Height: 87.4 mm

Width: 446 mm

Depth: 540 mm

## ENVIRONMENTAL

Operating Temperature: 5°C to 40°C

Non-Operating Temperature: -40°C to 60°C

Humidity: 8% to 85% RH

Operating Altitude: 0-3050 m (950 m at 40°C, De-rate temperature 1° degree C per 175 m above 950 m)

Sound Pressure: <6.6 Bels sound power level (23+/-2°C)

## APPROVALS

EMC: FCC Part 15 Subpart B Class A. ICES-003 Class A. EN 55032 Class A, EN 61000-3-2, EN 61000-3-3, EN 300386, EN 55024, EN 55035, EN 61000-4-3, EN 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, VCCI-CISPR32, VCCI-32-1

Safety: UL/CUL/CSA 62368, CB/IEC/EN 62368, CB/IEC/EN 60950

Environment: European Union RoHS, WEEE, European Union REACH

*Note: All specifications and figures are subject to change without prior notice.*

