

Solving The Real Issues In Storage

How can storage and application architects avoid moving large data sets across busses and datacenter networks? The NGD Systems Catalina 2 (CAT-2) is a second-generation Non-Volatile Memory Express® (NVMe™) solid state drive (SSD) that was built to address this specific issue. Storage architects confront how to scale applications in their storage environments without significantly increasing costs. This is especially true in distributed real-time analytics involving very large data sets of petabyte scale. In these use cases, the movement of these large data sets from storage to server memory has a huge impact on application performance.

In-Situ Processing: Application Acceleration and Scaling

The CAT-2 with **in-situ processing** is built to address many key issues in the programmable storage and content delivery markets that currently limit application performance and scaling. The CAT-2 processes the data where it resides in the SSD without using host resources to ensure more efficient use of storage. This approach, which is managed through standard APIs, affords significant flexibility for the developers of “big data” applications.

How We Do It

CAT-2 utilizes a patented breakthrough architecture which permits it to provide in-situ processing, high capacity, and low power consumption for a variety of target markets. CAT-2 uses the NVMe 1.3 protocol on a PCIe Gen3x4 interface, while the NGD Systems proprietary QoS technology manages power, flash endurance, and latency characteristics. Starting with a base of 3D TLC flash media utilized as the primary storage element enabled by a proprietary LDPC error correction capability, ensure complete platform protection. The product is offered in a PCIe Add-In Card (AIC) and U.2 form factor and is warranted for 3 years at up to 3 drive writes per day.

Key Applications

There are several verticals that can benefit from CAT-2's combination of features, and in-situ processing:

Hyperscale/Data Center



Market Needs:

High capacity
Low cost w/3D TLC & QLC
Consistent performance (QoS)
Disintegration of supply chain

In-Storage Computation

Content Delivery Networks



Market Needs:

Ultra-high capacity
Low cost w/3D TLC & QLC
Low read latency (QoS)
Low write wear

In-Storage Computation

Fog Storage/Edge Computing



Market Needs:

Optimized capacity
Low cost w/3D TLC
Small form factor
Moderate Write Wear

In-Storage Computation

Key Capabilities

Industry Leading Capacity

- Patented elastic FTL
- Up to 32 Terabytes capacity
- 0.65 Watts per terabyte
- 3D TLC enabled design

Application Aware In-Situ Processing

- Performs compute functions within storage device
- Reduce CPU overhead
- Improved performance

High Reliability

- End-to-end data protection
- Advanced LDPC ECC
- Full power loss protection
- QoS Management

CAT-2 NVMe SSD Specifications

	PCIe Add-In Card	U.2 - 2.5-inch SFF
Raw Unconfigured Capacity	4TB, 8TB, 16TB, 32TB	4TB, 8TB, 16TB
Interface/Protocol	PCIe Gen3 x4; NVMe 1.3	
Performance		
Random Read	35k IOPs (400usec command latency)	
Random Write	24k IOPs (100usec command latency)	
Sequential Read	250MB/s	
Sequential write	220MB/s	
Error Protection	Patented LDPC	
Active Power ¹	12W	
Supply Voltage	12V-only	
Operating Temp	0°C to 60°C ²	
Dimensions	111.28 x 254.00 x 18.05mm	69.85 x 100.45 x 15mm
Weight	485g	285g ³
Warranty	3 years	
1 - Configurable at factory 2 - Airflow dependent; passive cooling only 3 – Target, in development		

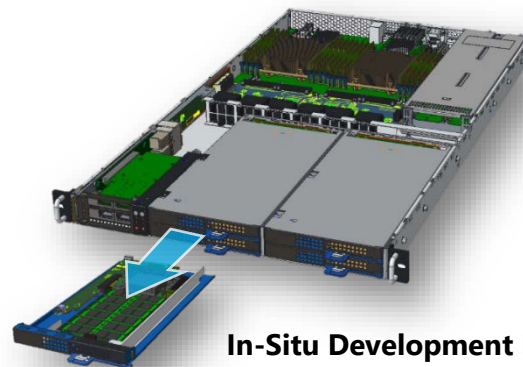
CAT-2 Part Number Reference

Part Number	Capacity (TB)	Form Factor	In-Situ Enabled
NC2520-xx0T1-C	04, 08, 16	2.5" U.2	No
NC2525-xx0T1-C	04, 08, 16	2.5" U.2	Yes
NC8020-xx0T1-C	04, 08, 16, 32	PCIe AIC	No
NC8025-xx0T1-C	04, 08, 16, 32	PCIe AIC	Yes



In-Situ Processing Unit Specifications

	Description	
API and CLI	Complete API with functions and variable to seamlessly use all In-Situ features Command line interface	
C/C++ Library	For customization and future support	
Platform PN	NC8025-080Txx-ISDP	x1, x2, x4



In-Situ Development Platform available, contact your sales rep for details