## HighPoint NVMe RAID Enables Scalable, High-Performance Intelligent Imaging

***Powering Data-Intensive Microscopy at 3i (Intelligent Imaging Innovations)***

Modern scientific microscopy is no longer limited by optics alone. Today's advanced imaging platforms generate massive, complex datasets that must be captured, visualized, and analyzed in real time. For 3i (Intelligent Imaging Innovations, Inc) - a leader in multimodal microscopy systems - storage performance, scalability, and reliability are mission-critical.
Headquartered in Denver, Colorado, with additional operations across the world, 3i develops and deploys high-resolution scientific imaging solutions alongside its flagship SlideBook® software, which manages the entire digital microscopy workflow from acquisition to analysis.
To meet the extreme data demands of modern imaging pipelines, 3i utilizes the HighPoint Rocket 7540 AIC as a core component of its workstation and acquisition architectures.

### Scaling Storage for Terabytes per Experiment

Today's microscopy experiments can routinely generate terabytes of data with a single microscope producing hundreds of experiments annually. These datasets must remain local to the workstation to support interactive 3D visualization and post-acquisition processing - making external drives or constant offloading to remote storage impractical.

*"Our users prefer to get as much storage space as possible within their budgets. It's simply not practical to constantly move files off the workstation to remote storage or another computer."*
— *Sergei Sorkin, Director of IT, 3i*

To address this challenge, 3i initially deployed the HighPoint SSD7140, later transitioning to the SSD7540 as its primary NVMe RAID platform. Today, HighPoint storage is deployed in many of their microscope systems and data analysis workstation solutions.
These solutions are installed primarily in Dell Precision workstations, configured exclusively for high-speed data capture and processing.

### Optimized NVMe RAID for Imaging Workflows

A typical 3i configuration consists of six 8TB NVMe SSDs combined into a single RAID 0 volume to maximize performance and capacity. Some customer deployments also leverage RAID 10 or multiple volumes per card, depending on data protection and workflow requirements.
HighPoint NVMe RAID cards play a critical role in two key imaging workflows:

**Data Analysis:** Large datasets are captured and processed on the same workstation, where low latency and sustained throughput are essential for smooth visualization and analysis.

**Data Acquisition:** During the acquisition process, the Rocket 7540's hosted storage operates as high-speed cache, absorbing data streams from multiple cameras before the data is later migrated to long-term storage.

Each camera may require around 900 MB/s throughput and many systems utilize two or more cameras simultaneously or near-simultaneously - well within the capabilities of the AICs PCIe Gen4 x16 architecture.

### Stability, Scalability, and Real-World Performance

*For 3i, raw peak performance is only part of the equation. Equally important are stability, scalability, and predictable behavior under sustained workloads.*
*"Ultimately, our requirement was to provide NVMe speed similar to what a RAID 0 with two Gen3 NVMe SSDs would deliver but with reliable, stable scalability in capacity and performance."*

The SSD7540 met these requirements by enabling:

- High-capacity local storage for multi-terabyte experiments
- Stable, sustained performance for long acquisition sessions
- Flexibility to scale storage density as imaging technologies evolve

### A Trusted Foundation for Intelligent Imaging

Despite the extreme and evolving demands across research microscopy, HighPoint NVMe RAID solutions have proven to be a reliable, scalable foundation for 3i's intelligent imaging platforms, enabling their customers to:

- Capture massive imaging datasets without interruption
- Perform 3D visualization and AI-driven analysis
- Scale storage capacity alongside next-generation imaging technologies

For 3i, HighPoint's Rocket 7540 is not just a performance upgrade - it is a critical enabler of scientific discovery.

**Learn More:** https://www.intelligent-imaging.com/