

Solution Profile

HMAX and iQ Solutions for Mining and Mineral Exploration

AI-Powered Nanotech Solution for Mining

Next Generation Automated Mineralogy

A modern replacement for legacy automated mineralogy systems enables geologists and metallurgists to move from sample to insight in minutes, not hours.

High Throughput Particle Analysis

For concentrates, tailings, cleanliness, or process control samples. Ideal for laboratories supporting production operations, not just research.

In Line and At Line Quality Control

Deployed directly in the processing plant to bridge the gap between the lab and production.

The Challenges Facing Modern Mining

Mining operations are under increasing pressure to deliver **higher recovery, lower costs, and faster decisions**—while dealing with ever growing volumes of complex analytical data. Automated mineralogy, particle analysis, and in line inspection systems generate **terabytes of multidimensional imaging and spectral data**, yet much of this data is still processed offline, too slowly, or with tools that are no longer scalable.

The Hitachi HMAX Solution

HMAX by Hitachi is a next-generation suite of AI powered solutions designed to bridge the digital and physical worlds by harnessing vast data from physical and digital assets, integrating advanced AI technology, and leveraging Hitachi's unmatched domain expertise. HMAX combines data collected from physical and digital assets such as sensors, industrial equipment, and machinery with Hitachi's domain knowledge accumulated through years of deploying operations and maintenance systems. Advanced AI technologies—i.e., perception AI, generative AI, agentic AI, and physical AI—are then applied to deliver new powerful solutions to organizations worldwide.

The Hitachi HMAX solution combines a GPU accelerated edge analytics platform purpose built for high throughput particle and mineral analysis, and research and development workflows. It combines advanced image processing, AI inference, and automation into a single, scalable solution that operates directly at the instrument or production site.

At the center is a compact, industrial grade system designed to process massive imaging and spectral datasets in real time, without reliance on cloud connectivity that transforms mineral characterization from a slow, offline workflow into a near real time, decision ready process. The solution is designed for mining, not IT labs and is engineered specifically for particle analysis, automated mineralogy, and quality control. It is not a repurposed data center solution—it is built to operate alongside SEMs, detectors, and plant floor systems.

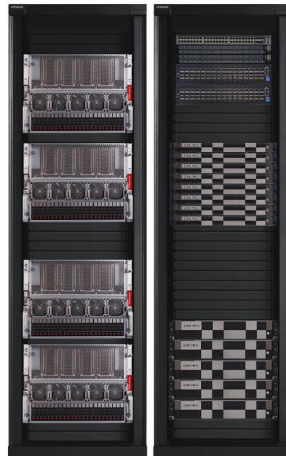


HMAX for Mining and Hitachi iQ

Meaningful AI outcomes require a solid data foundation and deep domain expertise

Hitachi High-Tech provides advanced nanotechnology tools and analytical solutions to the mining industry, specializing in electron microscopy and XRF analyzers for rapid, accurate mineral characterization.

These advanced operational technologies (OT) depend on robust information technologies (IT). With a single remote sensor generating over 168TB per week, ingesting, storing, preparing and analyzing this data requires artificial intelligence (AI) and machine learning (ML). Hitachi iQ combines VSP One storage, robust networking, GPU-based accelerated compute to ensure efficient collection, storage, and management of data. By facilitating streamlined data integration and accessibility, a well-constructed data



infrastructure enhances the scalability and adaptability of AI solutions. Hitachi iQ Studio software brings agent building tools and blueprints with rigorous data sovereignty, governance, and security measures, crucial for maintaining data integrity and compliance with regulatory standards. This integrated infrastructure platform brings the power of AI on premises and lays the data foundation for innovative, industry-specific AI solutions.

Faster Decisions - Reduce the time from sample collection to actionable insight—supporting faster operational decisions.

Higher Throughput - Process larger datasets without slowing acquisition or production.

Lower Cost of Ownership - Move from bespoke engineering to a standardized, supported platform.

Future Proof Investment - Built to scale with new detectors, new AI models, and new workflows as mining evolves.

Direct to GPU Processing

Data streams directly from detectors into GPU memory dramatically reduces analysis time and eliminates costly re runs.

Edge AI You Can Trust

All processing happens **on site**, and AI models are used for inference only—your data is never used to train external systems.

Next Generation Automated Mineralogy

- Faster particle detection and segmentation
- GPU accelerated spectral matching and AI workflows for faster results and reporting
- Near real time classified mineral maps

High Throughput Particle Analysis

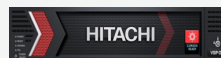
- Large area mosaic imaging area mosaic imaging
- Automated particle sizing, shape, and chemistry
- Consistent, repeatable workflows across sites

Hitachi iQ Minimum Requirements



Hitachi iQ M Series Accelerated Compute

2x Intel Xeon 6952P
1024GB (16x64GB, 6400MHz)
1x 2p 1/10GbE
2x 2p 200Gb QFSP12
4x H200NVL GPU's



Hitachi VSP One Storage

2x Controllers
1024GB Cache
2x1p 1GbE (Management)
4x 100Gb NVMe/TCP
14x 60TB NVMe Drives
525TiB usable

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