ASRock Industrial x intel

Elementary Empowers Lightweight AI Vision Inspection with ASRock Industrial iEP-7020E Performance

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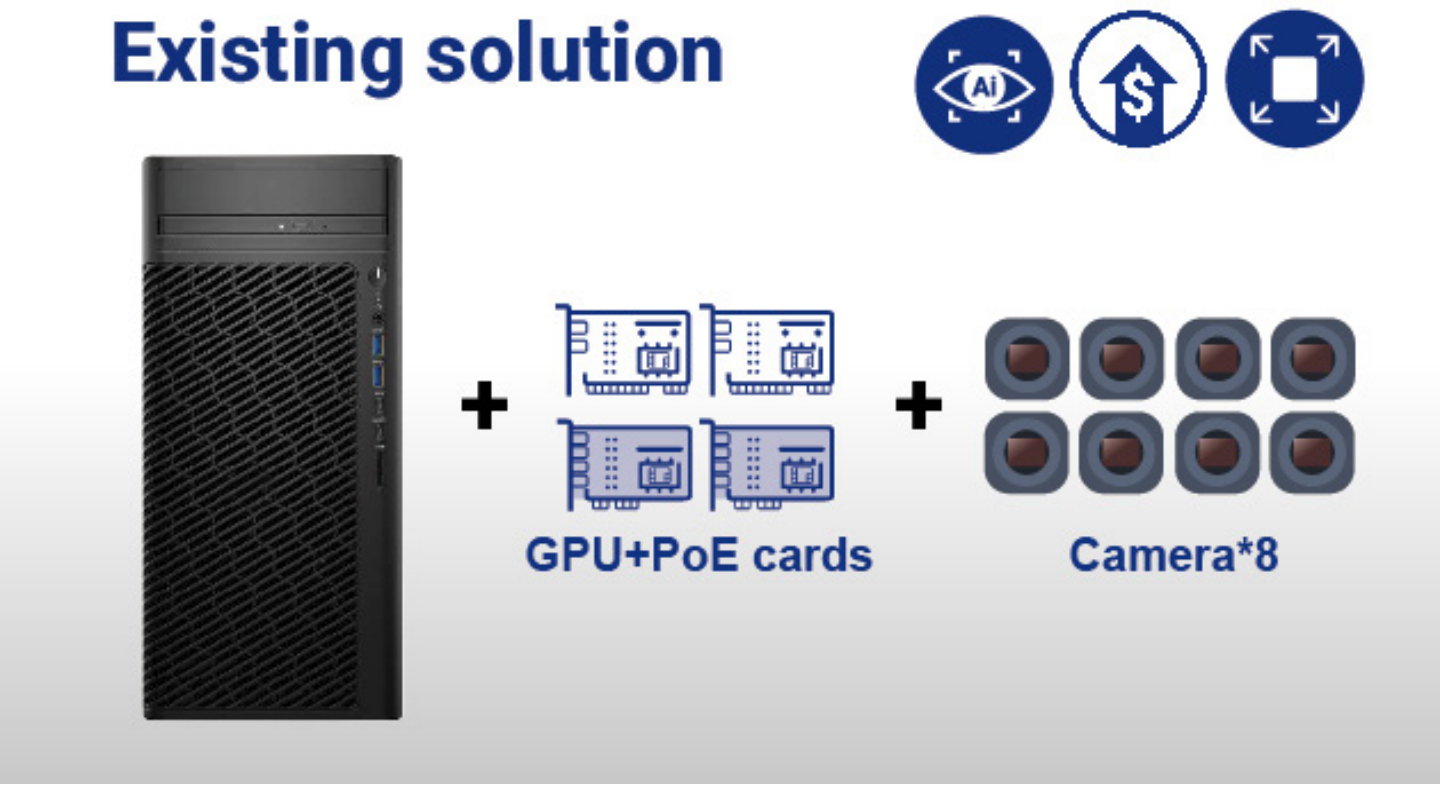
Elementary, a leader in AI-powered machine vision, adopted ASRock Industrial's iEP-7020E Series to power a compact AI vision inspection system for simpler applications, enabling real-time anomaly detection with up to two cameras. The new solution reduced system footprint by over 75% and lowered total cost, while maintaining low-latency performance and improving deployment speed, energy efficiency, and reliability.

Challenges

In the fast-evolving landscape of industrial automation, vision-based inspection systems must strike a balance between performance, scalability, and physical constraints. Elementary's original vision controller was built for complex inspection scenarios involving up to eight Basler GigE cameras. While powerful, this solution demanded a dual-slot PCIe NVIDIA GPU and two 4-port PoE PCIe cards – requiring a total of four PCIe slots and resulting in a bulky, high-cost system with a large physical footprint on the factory floor. Such setups were ideal for end-of-line inspections, but became over-engineered and impractical for simpler applications involving fewer cameras.

As demand grew for more compact and cost-efficient inspection solutions, particularly for installations with limited space and simpler AI workloads, Elementary identified the need to expand its product portfolio. They required a vision controller that could handle real-time AI inference for up to two cameras, fit easily into space-restricted industrial control cabinets, consume less power, and reduce total system cost, all without compromising performance. The challenge was to maintain AI capabilities and latency targets while dramatically shrinking the size, noise, and energy consumption of the system.



Solution

To address the limitations of its large-format vision controller, Elementary adopted ASRock Industrial's iEP-7020E Series Industrial IoT Controller as the foundation for a new, compact visual inspection solution. This system was purpose-built for simpler inspection use cases, involving up to two Basler GigE cameras, without compromising on AI performance or responsiveness. By leveraging the integrated GPU within the Intel® 13th Gen Core Industrial Processor inside the iEP-7020E Series, Elementary successfully ran its proprietary AI anomaly detection models, delivering reliable, low-latency inference that matched the performance of their larger, GPU-equipped systems. With built-in iGPU and dual PoE port support of the iEP-7020E Series, this shift eliminated the need for a discrete graphics card and multiple PCIe PoE expansion cards, dramatically simplifying the system architecture and reducing both cost and complexity.

The iEP-7020E Series' compact footprint and DIN-rail mountable design made it an ideal fit for tight industrial enclosures and space-limited factory control cabinets. Its support for 24V external power input further streamlined cabinet layout by minimizing internal wiring needs. Additionally, the fanless operation ensured minimal acoustic impact, while the robust industrial-grade design enhanced system reliability in demanding production environments. This integration enabled Elementary to develop a powerful and efficient inspection system that not only met technical and environmental constraints, but also aligned with customer demands for faster deployment, simplified maintenance, and lower total cost of ownership.

Benefits

Space-Saving Design at Low Cost

The solution reduced the overall system footprint by over 75%, making it ideal for tight enclosures and space-constrained factory setups - while significantly reducing the total system cost for complete inspection solution.

High-Performance AI at Lower Power

Delivered consistent, low-latency AI inference on iEP-7020E Series, powered by Intel® 13th Gen Core Industrial Processor with integrated GPU support, providing high-performance while reducing energy consumption, thermal output, and overall cost.

Simplified Deployment & Greater Reliability

With pre-configured settings, fanless operation, and fewer moving parts, the iEP-7020E Series enabled faster deployment, reduced acoustic noise, and improved system reliability in industrial environments.

Related Products

- iEP-7020E
- iEP-7030E
- iEP-7040E

Partner Name

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