



Case Study

AI-Powered PPE Detection for Workplace Safety

Transforming Workplace Safety with AI-Powered PPE Compliance Solutions

In today's rapidly evolving work environments, safety is paramount, and ensuring the proper use of Personal Protective Equipment (PPE) is crucial. Traditional methods of PPE compliance involve manual checks and often suffer from human error and inconsistency. Enter the AI-powered PPE checking device—a groundbreaking advancement set to transform workplace safety.

Challenges

The customer, **Konica Minolta** Business Solutions Europe, a subsidiary of Konica Minolta Inc., was looking for an Edge AI system for its automated PPE (Personal Protective Equipment) checks. They specifically required an embedded system powered by the advanced NVIDIA Jetson Orin module with up to 200 TOPS of AI performance. In addition, the system must support PoE or LAN ports for camera connectivity. The goal was to replace error-prone, time-consuming manual inspections to enhance accuracy, speed, and safety compliance while maintaining operational efficiency.

Main Requirements

- Embedded system with NVIDIA Jetson Orin module
- High AI computing performance with GPU acceleration
- GbE PoE and LAN ports for high-resolution camera deployment
- High scalability for massive data processing
- Compatibility with existing security and management systems



About Konica Minolta Inc.

Konica Minolta, a Japanese multinational technology company, with offices in 49 countries worldwide, manufactures business and industrial imaging products, including copiers, laser printers, multi-functional peripherals (MFPs) and digital print systems for the production printing market.

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Next-Level Edge AI System for Personal Protective Equipment Checking



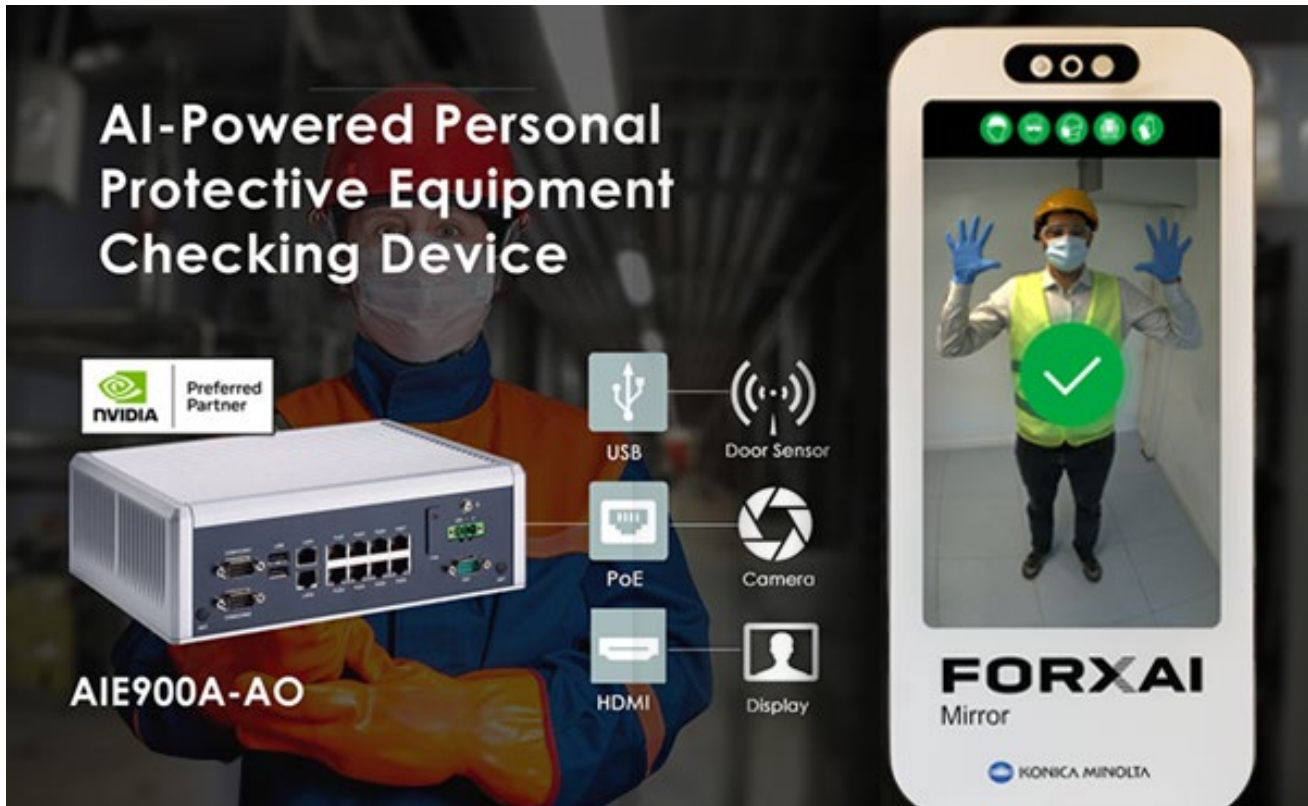
Axiomtek has proposed its AIE900A-AO, an edge AI computing system powered by the NVIDIA® Jetson AGX Orin™ platform with up to 200 TOPS of AI performance and integrates an advanced 1792-core NVIDIA Ampere™ GPU with 56 Tensor Cores. The AIE900A-AO comes with eight PoE (60 W) and two 2.5 GbE LAN for IP cameras and a range of vision sensors. It seamlessly integrates 5G, Wi-Fi 6E, and 2.5 GbE to offer unparalleled connectivity, enabling rapid data transfer

and real-time communication essential for mission-critical applications.

The AIE900A-AO operates within a wide temperature range of -25°C to +50°C, making it suitable for deployment in diverse environmental conditions. Its compact dimensions (239 x 185.3 x 79.4 mm) enable deployment in space-constrained field sites. The AIE900A-AO bundles with the Linux Ubuntu 20.04 OS environment and supports the NVIDIA® JetPack software development kit to foster the development of cross-industry AI-assisted operations.

Application AI Enhancements in PPE Checking

As AI and machine learning technologies continue to evolve, the capabilities of PPE checking devices will only improve, offering even greater precision and integration with other safety systems. Customer **Konica Minolta** deployed the AIE900A-AO within its Forxai Mirror - PPE checking device, utilizing its AI capabilities to perform real-time verification of employee attire as they pass through entry checkpoints. To facilitate effective PPE monitoring, the device is equipped with GbE PoE (Power over Ethernet) ports to support the deployment of high-resolution cameras, essential for capturing clear and detailed images of workers' PPE. With its wide operating temperature range and minimal heat output, the AIE900A-AO perfectly suits high-performance operations in space-constrained environments.



System Configurations

- NVIDIA® Jetson AGX Orin 32GB (200 TOPS)
- Seamless speed: 5G, Wi-Fi 6E, and 2.5 GbE combined
- 24 VDC with Ignition power control (E-Mark compliance)
- Supports 8 PoE and GMSL for camera and LiDAR
- Wide operating temperature range from -25°C to +50°C
- Supports device management and optional OTA deployment powered by Allxon

Why Axiomtek

As a member of the NVIDIA Preferred Partner, Axiomtek has been in close collaboration with NVIDIA in driving AI innovation at the edge. With expertise and relentless devotion to computer products, Axiomtek offers reliable and high-performance edge AI platforms for various applications and demands based on NVIDIA's cutting-edge technology to help build a smarter world.

“Our projects require substantial processing power, and the AIE900A-AO, which supports the NVIDIA® Jetson AGX Orin platform, delivers precisely that. We’ve successfully run multiple demanding models simultaneously with impressive speed and responsiveness. What truly distinguishes this unit is its efficiency; its low power consumption and minimal heat output have been revolutionary, allowing us to deploy the AIE900A-AO in environments where space and thermal management are crucial. Its overall design feels far more reliable than other comparable boards we've evaluated. This translates to peace of mind, knowing that our critical AI workloads are running on hardware we can trust,” said the Product Manager of the Konica Minolta Business Solutions Europe.

About Axiomtek Co., Ltd.

Axiomtek has experienced extraordinary growth in the past 30 years because of our people, our years of learning which resulted in our tremendous industry experience, and our desire to deliver well-rounded, easy-to-integrate solutions to our customers. These factors have influenced us to invest in a growing team of engineers including software, hardware, firmware, and application engineers. For the next few decades, our success will be determined by our ability to lead with unique technologies for AIoT and serve our key markets with innovatively-designed solution packages of hardware and software – coupled with unmatched engineering and value-added services that will help lessen the challenges faced by our systems integrator, OEM and ODM customers and prospects alike. We will continue to enlist more technology partners and increase collaborations with our growing ecosystem who are leaders in their fields. With such alliances, we will create synergy and better deliver solutions, value, and the expertise our customers need.

As a member of the NVIDIA Preferred Partner, Axiomtek has been in close collaboration with NVIDIA in driving AI innovation at the edge. Combining its strong edge computing expertise with NVIDIA’s AI and deep learning technologies, Axiomtek delivers a full portfolio of GPU-optimized hardware platforms and data communication solutions for deploying AI to the edge, helping customers speed up the implementation of deep learning capabilities into their IoT devices and turn Artificial Intelligence of Things (AIoT) into reality.