Case Study

Empowering the New Era of Smart Manufacturing

Background

Smart manufacturing is driving a new industrial revolution, demanding more from edge computing devices. ARK-1200 series is a compact, robust Edge Computers, designed to deliver reliable performance in challenging industrial environments. It seamlessly integrates Operational Technology (OT) with Information Technology (IT), accelerating production line automation and data acquisition, forming a critical infrastructure for Industry 4.0.

Customer Painpoints

Modern manufacturing demands industrial PCs with exceptional computing power, compact design, and wide operating temperature ranges. Additionally, devices must support various industrial communication protocols to connect sensors, robots, and automation equipment. ARK-1222 meets the rigorous requirements for 24/7 stable operation in harsh environments, ensuring uninterrupted production lines.

Our Solutions

Powered by Intel® N-series and Amston Lake processors, ARK-1222 delivers high-performance computing while maintaining low power consumption. Its fanless design prevents dust accumulation, significantly enhancing system stability and reducing maintenance costs. With a wide operating temperature range and rich I/O interfaces, it's an ideal choice for machine vision, collaborative robots, and automation control systems, accelerating edge AI deployment.

- Intel® N-series / Amston Lake processors for optimal performance
- Up to 16GB DDR5 memory ensures smooth and reliable operation
- Dual GbE LAN ports and multiple serial/USB ports for versatile connectivity
- M.2 expansion slots for flexible storage and wireless communication options
- Wide operating temperature range of -40°C to 70°C, ideal for harsh industrial environments

ARK-1222

Intel® N97 to i3-N305, DDR5 Memory, Versatile Connectivity, and Extreme Temperature Support

Case Study

Security IEC 62442-4-2 in Automation

Background

As manufacturing increasingly integrates AI vision for smarter automation, cybersecurity becomes crucial for maintaining reliable operations. With the Cyber Resilience Act (CRA) coming into effect by 2027, manufacturers are seeking IEC 62443-4-2 certified platforms to safeguard data, support AI-driven edge computing, prevent downtime, and ensure compliance with EU regulations—delivering secure, resilient, and efficient production environments.

Customer Painpoints

A packaging machine maker was seeking to enter the European Union with its new AI vision product. Their intelligent packaging machines require high computing performance and support for GPU card expansion to execute seamless vision-to-action operations. Their primary focus was the data collected and monitored at the edge; this data was used to help improve the efficiency and accuracy of new product lines.

Our Solutions

Leveraging Intel® 12th, 13th, and 14th Gen Core® i processors, the ARK-3534 series provides diverse I/O for up to 25 device connections and up to 4 PCIe/PCI slots to satisfy advanced AI and industrial applications, such as AOI, semiconductor equipment, and collaborative robot applications. With its capability to add a PCIe x16 GPU for advanced AI computing and intelligent data generation, customers and applications require an IEC 62443-4-2 certified embedded controller to secure this critical data.

- Supports Intel 12/13/14th Gen Desktop Core i processor, Celeron/i3/i5/i7/i9 up to 24 cores
- PCIe and PCI expansions
- 3x 2.5Gbps, 1x 1Gbps LAN port, total 4 LAN ports, 2x CANBus (optional) for robotic applications

ARK-3534D

Powerful Multi-Core Intel® Support with High-Speed LAN & Expandable PCIe for Advanced Robotics

Case Study

Semiconductor Equipment High Integration

Background

With the growing demand for high-performance and reliable electronic devices in IPC, semiconductor automation equipment is becoming increasingly vital, as automation systems can reduce human errors, contamination risks, and production variability. This equipment requires a high-performance, compact, yet I/O-rich system as the main controller. To meet these needs, the ARK-1125 series is designed with rich I/O in a palm-size form factor and industrial-grade heat dissipation capabilities, ensuring stable operation while maintaining expansion opportunities.

Customer Painpoints

In recent years, semiconductor automation equipment has required a multi-functional yet compact industrial computer as a main controller. This industrial PC must monitor other devices, collect large amounts of data, and respond immediately while maintaining a small form factor to fit into constrained equipment spaces. It also needs to ensure system stability even when there is minimal airflow.

Our Solutions

The ARK-1125 is powered by either Intel® N200 QC SoC processor or Intel® Atom® x7211E DC SoC processor, offering high performance with low power consumption. It is a compact and versatile fanless embedded system. Its palm-sized dimensions allow it to be installed in limited-space environments, and its ample I/O ports and several M.2 slots allow expansion with various devices. Moreover, it operates within a wide operating temperature range of -30 to 60°C, and it serves as a ready-to-use platform for semiconductor automation equipment.

- Intel Latest Atom® Processor X Series and N Series
- I/O Interfaces for Different Applications
  - » DDR5 memory up to 16GB
  - » M.2 Key B, E and M for SSD, WiFi, 5G solution
  - » Hailo-8 AI module support
- CE, FCC, CB, UL, UKCA, CCC and BSMI for all SKUs

Energy Star for Energy Efficiency in USA – **ARK-1125C**

RED for wireless module installation in EU – **ARK-1125H**

ARK-1125

Next-Gen Intel® Atom® with AI Support, Flexible I/O, and Global Compliance

Case Study

Smart Energy Storage Management

Background

With the U.S. energy storage market projected to surpass 30 GW (gigawatts) in annual deployments by 2030, Smart Energy Storage delivers a future-ready, all-in-one solution for fast and cost-effective system integration. It simplifies deployment without compromising quality or configurability. Tailored Smart Service plans offer industry-leading guarantees, optimized performance, and AI-driven predictive maintenance to extend system lifespan and protect long-term value. As AI-enabled, edge-based energy management becomes essential in decentralized power networks, Smart Energy Storage positions itself as a reliable and scalable platform for commercial, industrial, and grid-edge applications.

Customer Painpoints

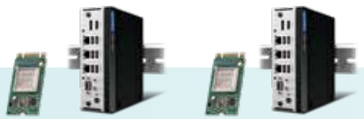
Smart Energy Storage systems rely on a distributed computing architecture, with dedicated units performing real-time monitoring and advanced data analytics. Designed for outdoor deployment, these systems must ensure reliable operation in harsh cabinet environments, while offering a compact footprint and a vertical I/O layout for easy installation and maintenance.

Our Solutions

Each Smart Energy Storage cabinet deploys two ARK-1251 systems, one for monitoring and one for data analysis. Built for industrial environments, ARK-1251 features a fanless design, IP40 protection, and a −20°C to 60°C temperature range. Its DIN-RAIL mounting and vertical I/O layout simplify cable management and facilitate on-site maintenance.

With integrated Hailo AI modules, ARK-1251 enables real-time edge inference for anomaly detection, predictive maintenance, and performance optimization. By analyzing battery health data locally, it enhances system reliability, reduces downtime, and improves energy efficiency. Combined with EdgeBMC and DeviceOn, the system supports remote diagnostics, OTA updates, and AI development management for scalable and reliable Smart Energy Storage operation.

- Intel® Core Ultra 5/Ultra 7 processor built-in
- -20 ~ 60°C extended operating temperature
- 12V ~ 28V wide range power input support
- Rich vertical I/O design: 4x COM, 3x LAN, 6x USB, 3x M.2, 8 bit DIO, DP+HDMI
- Supports EdgeBMC OOB, DeviceOn for remote monitoring



ARK-1251

Hailo AI add-on w/ AMK-A0054 thermal kit