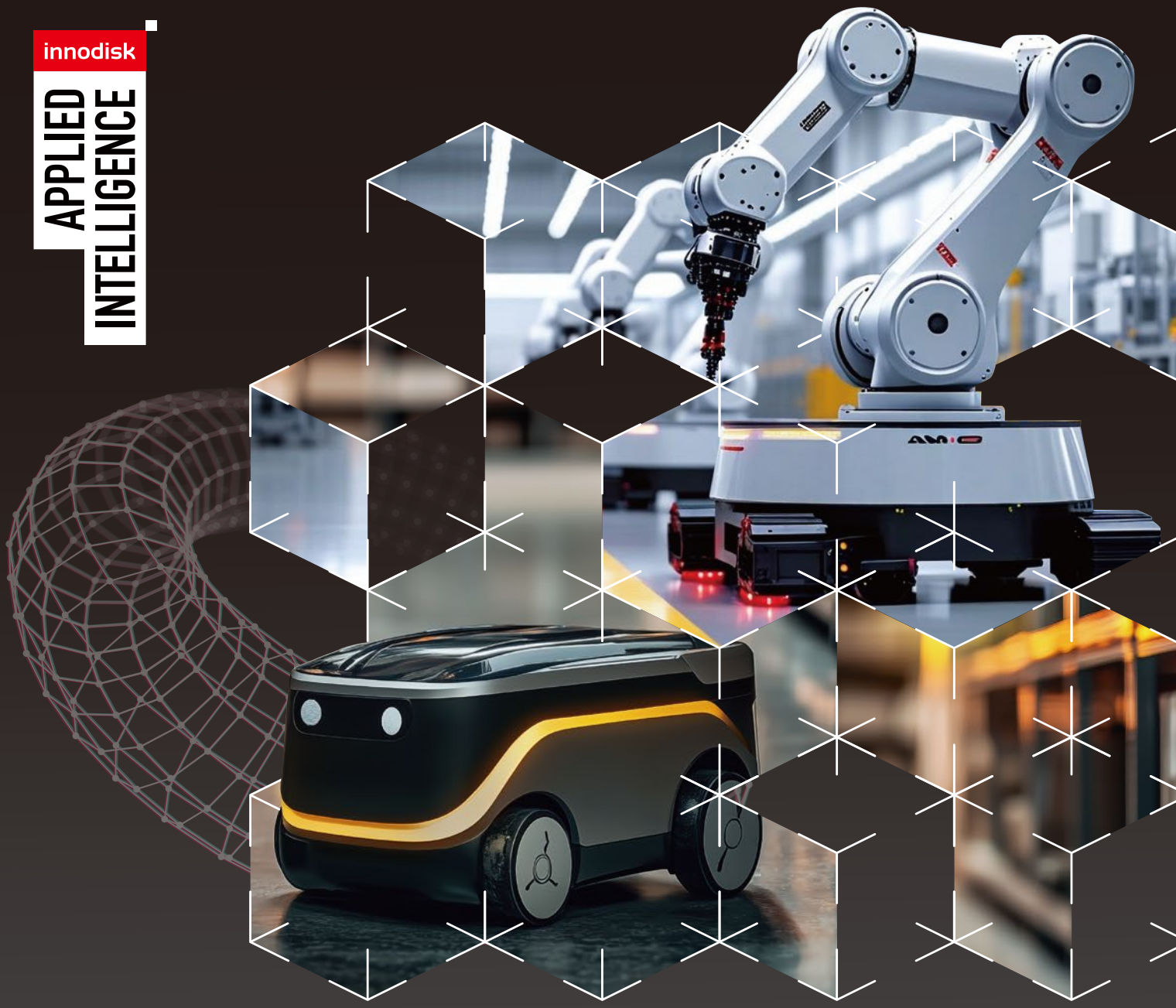
innodisk

APPLIED INTELLIGENCE



INNODISK AGV & AMR EMBEDDED SOLUTIONS

DRIVING THE FUTURE OF SMART MOBILITY & ROBOTICS

As industries embrace intelligent automation, AGV (Automated Guided Vehicle) and AMR (Autonomous Mobile Robot) are transforming logistics, manufacturing, and smart mobility. Reliable, high-performance technologies play a crucial role in driving these advancements.

With deep expertise in the embedded industry and industrial-grade solutions, Innodisk delivers comprehensive, future-ready solutions tailored for AGV & AMR applications.

AGV & AMR: KEY DIFFERENCES AND EMERGING APPLICATIONS

Some may be confused by the differences between AGV and AMR—both automate movement, but they function in distinct ways.

AGV is designed to follow fixed paths, using technologies like magnetic strips, laser guidance, or optical tracking. They are highly efficient in structured environments.

AMR leverages AI-driven autonomous navigation, allowing them to adapt to dynamic spaces like factories, hospitals, and complex industrial settings.

Both AGV and AMR are expanding their applications across various industries. Now, let's see how this technology is being trialed in real-world settings.

SERVICE ROBOTICS

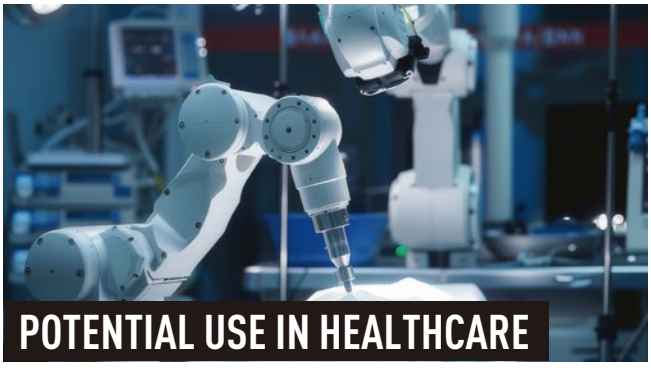
- In-restaurant food delivery robots
- Autonomous cleaning / vacuum robots
- AI-powered reception and service robots

LOGISTICS

- Warehouse parcel sorting and delivery
- Automated transfers in supply chain
- In-factory logistics and parts transportation

HIGH-RISK AND HEAVY-DUTY TASKS

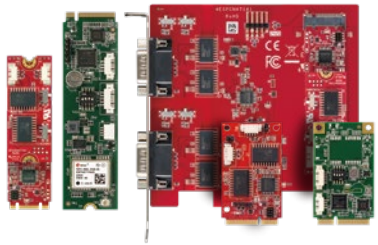
- Mining vehicles for hazardous environments
- Automated irrigation/cultivation systems for efficient farming



POTENTIAL USE IN HEALTHCARE

- Automated medical supply delivery
- Safe transport of medical waste
- Surgical robotics / robotic arms

INNODISK'S MODULAR SOLUTIONS FOR AGV & AMR



CAN Bus & CAN FD MODULE

Acts as the robot's central nervous system, serving as a communication network that enables real-time data exchange between various components and systems.

- High-speed transmission and enhanced data processing.
- 2.5kV voltage isolation protection.
- Stable operation from -40°C to 85°C.
- Robust ESD safeguards support Air-15kV and Contact-8kV.

DRAM MODULE

Provides high-speed data access for real-time processing and efficient task execution.

- DDR5/DDR4 SODIMM with speeds up to 6400MT/s and capacities up to 64GB.
- Compact size for small form-factor PCs.
- Original IC to meet strict industrial standards.
- Complies with RoHS and CE / FCC certifications.

CAMERA MODULE

Acts as the robot's eyes, enabling real-time vision, object recognition, and environmental awareness for precise navigation and operation.

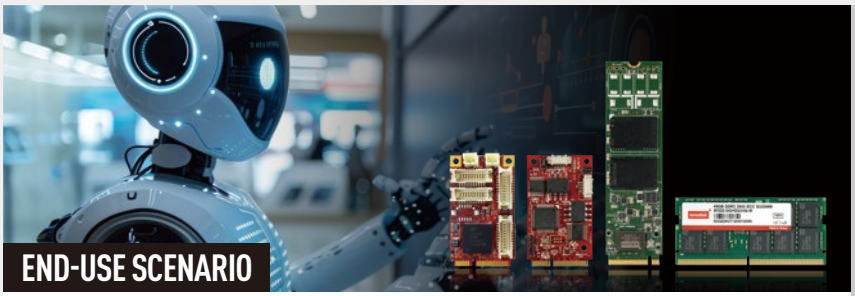
- MIPI over Type-C Camera Modules: Extended cable length for flexible installation.
- GMSL2 Camera Modules: IP67-rated for waterproof and dustproof durability.
- AI platform integration service.

FLASH STORAGE

Acts as the robot's long-term memory, ensuring stable data storage for logs, system backups, and critical operational data.

- Industrial-grade PCIe Gen4 NVMe SSDs provide reliable and stable storage.
- PLP (iCell) Technology prevents data loss.
- 100% industrial-grade 3D TLC NAND Flash provides higher capacity and longer lifespan.

PRACTICAL APPLICATIONS AND SUCCESS STORIES



END-USE SCENARIO

HUMANOID ROBOT FOR AUTOMOBILE ASSEMBLY LINE

INNODISK SOLUTION

- mPCIe (USB) to dual isolated CAN 2.0B (CAN Bus) and mPCIe to eight RS-232/422/485 Module (Serial)
- DRAM: DDR5 5600 MT/s SODIMM
- SSD: M.2 2280 PCIe Gen 4 x4 4TE2

A humanoid robot reduces human labor by handling tasks like transporting heavy objects and precise installations. With Innodisk's solution, the client's robot enhanced multi-module coordination and data synchronization. Additionally, the wide-temperature and isolation protection design of the modules ensured stability and resistance, perfectly matching the robot's motherboard in demanding environments.

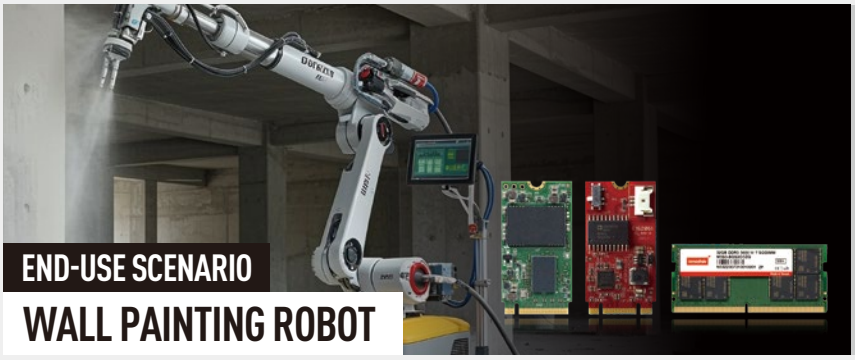
END-USE SCENARIO

AMR FOR WAREHOUSE

INNODISK SOLUTION

- Camera: MIPI over Type-C 8MP Fixed Focus Camera Module
- CAN Bus Module

With increasing complexity and a wide range of goods in warehouses, precise object sensing is crucial. By providing a patented MIPI over Type-C camera and a customized PCB design, Innodisk helped customers achieve low-latency, **1-meter signal transmission** with fisheye visual coverage. Combined with Innodisk's CAN Bus module, we enabled AMRs to leverage advanced vision sensors and a robust communication network.



END-USE SCENARIO

WALL PAINTING ROBOT

INNODISK SOLUTION

- CAN Bus Module: M.2 to Single CAN Bus 2.0B WT
- DRAM: DDR5 Wide Temperature SODIMM
- SSD: M.2 2242 PCIe Gen 3 x4 3TE8

A wall-painting robot needed precise pressure control and real-time adjustments to ensure a consistent painting process. By integrating Innodisk's solutions into the client's system, the robot was able to achieve greater efficiency, minimize waste, and enhance painting consistency through timely data transmission.