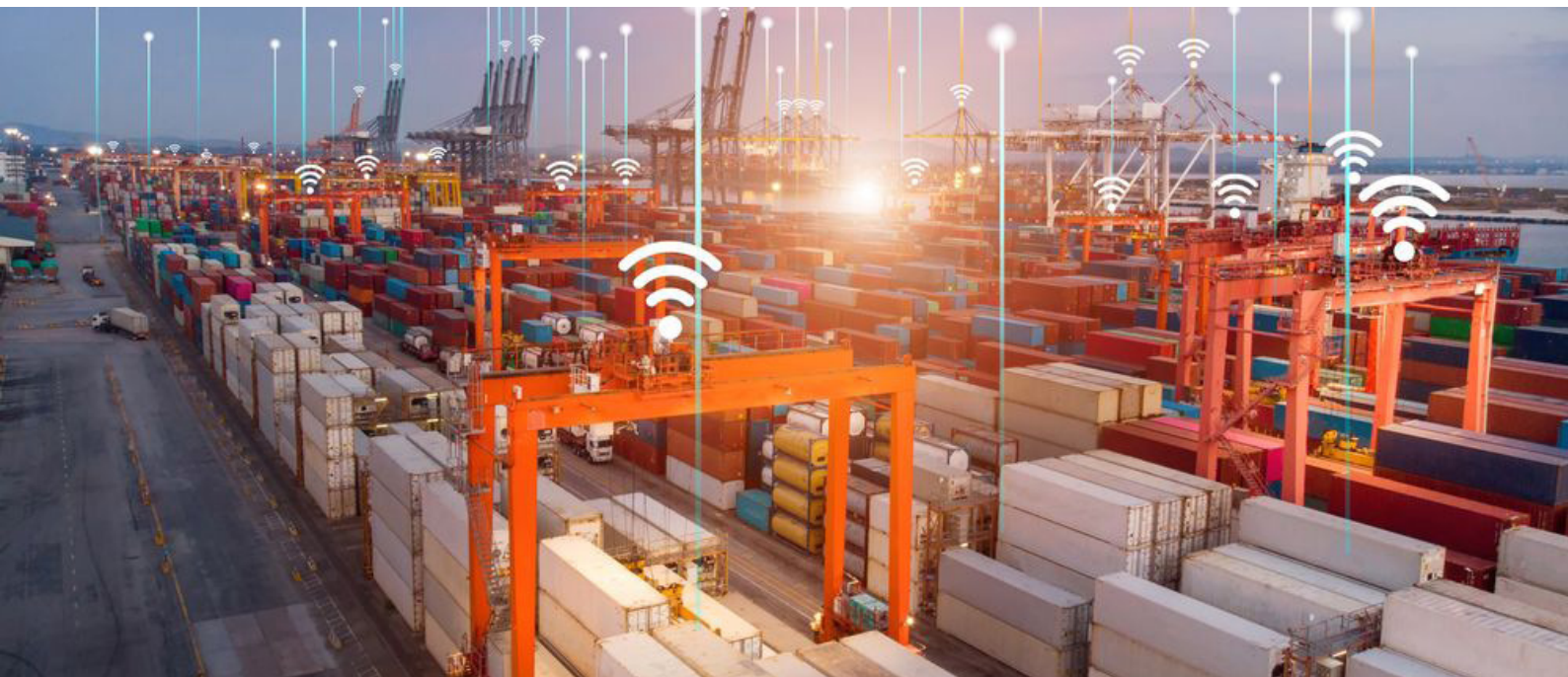


## 5G MPN FOR LOGISTICS USE CASE

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### AUTOMATED LOGISTICS OPERATIONS

Modern production and logistics facilities are rapidly evolving through the adoption of warehouse automation, driven by the deployment of Autonomous Mobile Robots (AMRs), Automated Guided Vehicles (AGVs), Pick-and-Place robots, and other intelligent systems. These machines operate 24/7, autonomously transporting raw materials, components, and finished goods across various workstations.

Technologies like LiDAR, Simultaneous Localization and Mapping (SLAM), and real-time sensors enable precise navigation, collision avoidance, and task coordination. At the heart of this ecosystem is the fleet management system, which monitors robot status in real time and orchestrates tasks for maximum operational efficiency.

However, to unlock the full potential of such automation, reliable, low-latency, and scalable connectivity is essential—something traditional wireless technologies like Wi-Fi struggle to provide.

### BUSINESS BENEFITS

**40%**  
fewer Wi-Fi repeaters  
and mesh routers

**70%**  
fewer Wi-Fi  
disruptions

**60%**  
savings on cabling  
and trenching

## Main challenges and motivation for replacing Wi-Fi in Logistics:

- **High Latency:** Maintaining sub-50 ms latency across multiple mobile robots is difficult with Wi-Fi, particularly for tasks requiring real-time responsiveness.
- **Unreliable Communication:** Wi-Fi's random back-off and lack of deterministic traffic scheduling can cause one device to monopolize bandwidth, impacting others.
- **Coverage Gaps:** Even with dense AP deployment, warehouses often suffer from dead zones and signal interference.
- **Roaming Disruptions:** Handover between access points can interrupt connectivity and delay mission-critical operations.

## THE KONTRON ADVANTAGE: PRIVATE 5G FOR SEAMLESS AUTOMATION IN LOGISTICS

By enabling real-time control, wider coverage, and resilient communication, Kontron's private 5G transforms warehouse automation from a bottlenecked process into a fluid, intelligent, and scalable operation—setting the foundation for next generation manufacturing efficiency.

Kontron's private 5G solution offers a robust and scalable alternative to overcome all logistic challenges, delivering carrier-grade reliability, performance, and control—tailored for industrial use:

USE CASE ▼	CHALLENGES AND LIMITATIONS ▼	KONTRON 5G MPN BENEFITS ▼
Real-time mobility	Dynamic environments with large moving metal objects are affecting signal penetration and quality, and can't be addressed with wireless alternatives like Wi-Fi, while cables are neither practical nor flexible.	Providing superior coverage in mixed indoor-outdoor setups with uninterrupted connectivity of AGVs as they move across various zones, ensuring a smooth handover for a safe autonomous operation and communication among the AGVs/AMRs and under a heavy network load.
Reliable & secure communication	Wi-Fi's random back-off and lack of deterministic behaviour is causing network performance issues like monopolized bandwidth, black spots, congestion, handover issues, making it unacceptable for business-critical communications.	Guaranteeing deterministic performance for business critical applications. Ensuring industrial-grade data continuity, reliability, and security with a personalized project approach, end-to-end design, and implementation.
Replacing cables	Cables' limited flexibility is hindering movement of equipment like AGVs or AMRs and complicating reconfiguration of layouts. Cables are prone to failure and causing costly downtimes due to time-consuming installation and maintenance.	Delivering wired-like performance without the need to install and constantly maintain expensive cabling infrastructure. Limiting costly downtime and providing much needed flexibility in introducing new devices.

## WHY KONTRON?

Kontron's 5G platform is optimized for **industrial-grade performance**, **low power edge deployments**, and **open integration** with third-party automation systems. Combined with our deep experience in embedded systems, telco software, and industrial computing, Kontron is uniquely positioned to support manufacturers on their **Industry 4.0 and digital transformation journey**—starting with a compact **5G Starter Pack** and scaling to full-factory coverage.

