XCOM RAN™ by Globalstar

The Rise of Micro-Fulfillment Centers

Why Automation Demands Private 5G

The Micro-Fulfillment Boom

Retail and logistics are transforming rapidly under the weight of e-commerce demands and consumer expectations for same-day or even same-hour delivery. To keep up, companies are shifting from large, centralized distribution centers toward micro-fulfillment centers (MFCs) located closer to urban populations. These smaller, highly automated facilities reduce delivery costs and time while improving customer satisfaction.

The Role of Automation in MFC Operations

MFCs thrive on automation and efficiency, powered by a dense layer of IoT devices:

- Automated mobile robots (AMRs) and automated guided vehicles (AGVs) moving goods with precision
- AI-powered vision systems for real-time inventory checks, quality assurance, and order accuracy
- Connected conveyors, sensors, and sortation systems that manage product flow
- Environmental and energy monitoring devices that optimize storage conditions and reduce costs

Together, these systems create a fast, highly orchestrated ecosystem where downtime or connectivity failures can disrupt entire operations.

Why Wi-Fi and Public Cellular Fall Short

Traditional wireless options are hitting their limits inside MFC environments:

- Wi-Fi struggles with interference, limited coverage in dense layouts and handoff failures for mobile robotics
- Public cellular provides broader coverage but introduces spectrum congestion, lack of in-building signal penetration, unpredictable performance, and higher latency that jeopardize mission-critical applications

In short, neither can reliably scale to the dense, mobile, and low-latency requirements of modern MFCs.

The Case for Private 5G Networks

Private 5G is emerging as the vital infrastructure for next-generation fulfillment operations:

- Dedicated, interference-free spectrum ensures predictable performance
- Low-latency connectivity enables real-time robot coordination and safety-critical processes
- Seamless mobility supports fast-moving devices without drops or delays
- Strong security and data sovereignty protect sensitive operational and customer data
- Scalable bandwidth grows with facility automation and evolving IoT needs

Network Optimization with XCOM RAN by Globalstar

Even private 5G isn't without challenges in high-density industrial settings. That's where optimized solutions like XCOM RAN™ come in. XCOM RAN dynamically manages interference, RF noise, and device coordination, while increasing data throughput and ensuring consistent performance in complex environments like warehouses and MFCs.

© Globalstar, Inc. All rights reserved.