Seamless Connectivity for Mobile Robots in a Smart EV Assembly Plant

Case Study

Project Overview

To drive capacity expansion and embrace Industry 4.0 standards, a leading New Energy Vehicle (NEV) manufacturer constructed a state-of-the-art smart factory. A critical component of this facility was the automation of the general assembly line using mobile robots (AGVs). Maisvch deployed nearly 100 units of high-performance Industrial 5G/Wi-Fi 6 Routers, creating a high-speed, low-latency wireless network that ensures seamless roaming for mobile assets, setting a new benchmark for intelligent automotive manufacturing.

Results

The deployment of Maisvch's wireless solution has delivered significant operational improvements:

Enhanced Productivity:
AGVs operate without network-induced pauses, maximizing the throughput of the assembly line.

Real-Time Quality Control:
High-bandwidth stability allows for instant video upload and analysis, ensuring product quality defects are caught immediately.

Scalability:
The use of Wi-Fi 6 and 5G ensures the factory network is future-proof, ready for more advanced AI and IoT devices in the coming years.

Featured Products

MIR785-W
5G Industrial Cellular WiFi Router

The Challenges

In a metal-rich, high-interference factory environment, standard commercial Wi-Fi solutions fail to meet the strict requirements of automotive production. The project demanded:

- Zero-Interruption Roaming (Business Continuity):

AGVs and inspection robots are constantly moving between different Access Points (APs). To prevent the robots from stopping or "stalling," the network required a seamless fast roaming mechanism with a handover latency of <50ms.

- High Bandwidth for Visual Inspection:

The production line utilizes automated video quality inspection. This requires real-time transmission of high-definition video data from mobile terminals to the server. The network needed to guarantee a bandwidth of >100Mbps per terminal, necessitating Wi-Fi 6 or 5G capabilities.

- Industrial-Grade Anti-Interference:

The assembly line is filled with Variable Frequency Drives (VFDs) and heavy machinery that generate significant electromagnetic noise. The wireless equipment had to support Dynamic Frequency Selection (DFS) and industrial shielding to avoid interference and maintain signal stability.

Solution

Working closely with a top-tier robotics integrator, Maisvch provided a cutting-edge wireless communication solution tailored for the mobile robots in the assembly line.

Hybrid 5G & Wi-Fi 6 Technology:

The core of the solution is the Maisvch MIR785-W, a dual-function Industrial Router.

- Wi-Fi 6 Performance: By utilizing Wi-Fi 6 (802.11ax), the system handles high-density connections and provides the massive throughput required for video analytics.
- 5G Backhaul: The routers support 5G cellular connectivity, offering a flexible and high-speed alternative for data backhaul where cabling is difficult.

Seamless Handover:

The deployed routers are optimized for high-speed mobility. They successfully achieved the sub-50ms roaming requirement, allowing AGVs to switch network nodes imperceptibly. This ensures that control commands and video streams are never interrupted, maintaining the rhythm of the assembly line.

Standardized Reliability:

Approximately 100 units of the MIR785-W were installed on AGVs and robots throughout the facility. The solution has proven so robust that it has become a standard application blueprint for the integrator's future automotive projects.

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