

Case Study: Mitsubishi Electric – Private 5G Center of Excellence for Industrial Automation

Showcasing 5G-Enabled Control, Connectivity, and Automation in a Unified Industrial Environment

Summary

Mitsubishi Electric, a global leader in industrial automation, sought to validate the role of Private 5G as a unified wireless backbone for the factory of the future. For a board-level demonstration, a 5G-enabled Center of Excellence (CoE) was established to showcase real-world industrial automation use cases. The objective was to prove that a single Private 5G network could reliably support robots, PLCs, AGVs, and



remote control interfaces while meeting the stringent latency and performance demands of modern manufacturing.

Problem Statement

The demonstration for Mitsubishi Electric's Board of Directors from Japan posed several complex challenges that needed to be addressed simultaneously:

- Showcasing real-time wireless control of industrial robots without performance degradation.
- Ensuring deterministic, low-latency connectivity suitable for PLC-based automation.
- Integrating robots, PLCs, AGVs, and control devices on a single wireless network.
- Providing mobility and flexibility through tablet-based remote control.
- Delivering a rapid, production-grade deployment aligned with a board-level evaluation.

Conventional wired architectures were too rigid, while Wi-Fi lacked the reliability required for mission-critical industrial automation.



Proposed Solution

A Private 5G Wireless Network was deployed as the foundation of the industrial CoE. The architecture mirrored real factory conditions and enabled a clear, impactful demonstration of key industrial automation use cases running concurrently:

- 1. Wireless Robotic Control:** Industrial robotic arms were controlled in real-time over 5G using tablet-based interfaces.
- 2. PLC Connectivity:** Wall-mounted PLCs were integrated into the 5G network, replacing traditional wired connections.
- 3. AGV Connectivity:** Automated Guided Vehicles (AGVs) were connected for continuous and reliable navigation and control.
- 4. Unified Connectivity:** All devices (robots, PLCs, AGVs, tablets) operated on a single, unified Private 5G network.

Outcome and Impact

The Private 5G CoE was successfully deployed within a short timeframe and met all technical and demonstration requirements. Key outcomes included:

Metric	Result
Robotic Control	Smooth, real-time tablet-based control of robotic arms.
PLC Performance	Stable and deterministic PLC communication over wireless 5G.
AGV Operation	Reliable AGV operation and coordination within the network.
Board Approval	Successful board-level demonstration leading to contract closure.

The project established a benchmark Private 5G Center of Excellence for industrial automation, validated Private 5G as a viable alternative to wired industrial networks, and created a scalable model for future Industry 4.0 deployments.

Conclusion

The successful deployment and demonstration for Mitsubishi Electric's board proved that Private 5G is ready to serve as the nervous system for the modern smart factory. It provides a secure, high-performance, and flexible foundation to unify industrial automation, accelerate innovation, and unlock the full potential of Industry 4.0.