

# Industrial Wi-Fi 7 in Action: EKI-6333BE-4GD

Case Study Portfolio



IoT Automation,  
Industrial Wireless and Sensing, 2026

# When Industrial Wi-Fi 7 Actually Makes Sense

Wi-Fi 7 matters when wireless performance starts affecting operations, not simply because it is faster.

## *Upgrade when Wireless is Operational Infrastructure*

## *What Wi-Fi 7 Adds*

### **01 When 2.4/5 GHz Spectrum Is Already Congested**

When crowded 2.4/5 GHz traffic starts affecting performance, tri-band Wi-Fi 7 adds 6 GHz spectrum for more usable wireless headroom.



### **More Spectrum Headroom**

6 GHz Tri-band Access

### **02 When Peak Traffic Exceeds Available Capacity**

When concurrent video, test data, or high-volume traffic creates bottlenecks, up to 5.8 Gbps provides more capacity headroom for demanding workloads.



### **More Capacity Under Load**

Up to 5.8 Gbps

### **03 When One Wireless Link Is Not Reliable Enough**

When mobile or latency-sensitive operations cannot depend on a single band, MLO uses multiple Wi-Fi links to improve connection resilience and responsiveness.



### **More Resilient Connectivity**

Multi-Link Operation (MLO)

# Three Real Cases, Three Operational Wi-Fi Constraints

| Operational requirement / Constraint                                                                                                                                                                                           | Why Wi-Fi 7 / How It Was Applied                                                                                                                                                                           | Reported impact                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <p><b>01 Aircraft ATE</b><br/><b>Mobile ATE &amp; High-Volume Test Data</b></p> <p>Moving test points required repeated cable rerouting while dense avionics and RF data increased wireless load.</p>                          | <p><b>More Capacity Under Load<br/>+ More Spectrum Headroom</b></p> <p>Tri-band AP/client bridge carries high-volume ATE data to centralized analytics.</p> <p>#DataCapacity</p>                           | <p>→</p> <p><b>60% shorter redeployment</b></p> <p>Real-time eye-diagram / BER analysis.</p> |
| <p><b>02 Smart Tram</b><br/><b>Continuous T2G &amp; Short-Dwell Data Offload</b></p> <p>4K CCTV and operational data had to stay connected during movement, while short station dwell required fast data offload.</p>          | <p><b>More Resilient Connectivity<br/>+ More Capacity Under Load</b></p> <p>On-board client with trackside / station APs for continuous connectivity and burst offload.</p> <p>#MovingConnectivity</p>     | <p>→</p> <p><b>20 sec station offload</b></p> <p>Uninterrupted CCTV streaming reported.</p>  |
| <p><b>03 High-Bay Warehouse</b><br/><b>RF Shadowing &amp; Costly High-Bay Cabling</b></p> <p>A 60,000 m<sup>2</sup> warehouse with 12 m steel racks faced RF shadowing, dense device traffic, and costly high-bay cabling.</p> | <p><b>More Spectrum Headroom<br/>+ More Capacity Under Load</b></p> <p>6 GHz wireless backhaul extends hard-to-wire zones while preserving 2.4/5 GHz for existing endpoints.</p> <p>#DedicatedSpectrum</p> | <p>→</p> <p><b>2 months → 1.5 weeks deployment</b></p> <p>~65% installation cost</p>         |

## WHY WI-FI 7 HERE

A mobile wireless bridge must carry concurrent high-volume test streams without limiting ATE mobility; tri-band capacity addresses the load.

60%

Shorter Test Redeployment

Real-time

Eye-Diagram &amp; BER Analysis

Wireless

Test Station Mobility

Deployment Location: Aircraft Manufacturing Facility, India

## Overview:

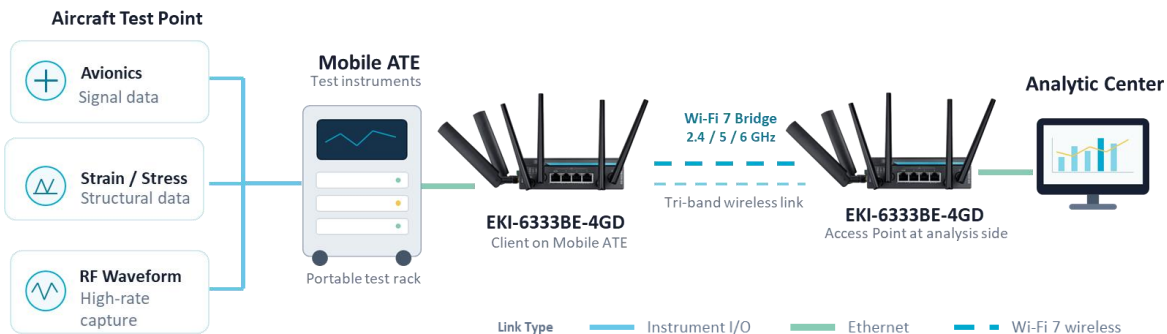
Aircraft test points move among the cockpit, wings, and tail. Mobile ATE stations capture concurrent avionics, structural, and RF data for centralized analysis.

## Challenges / Requirements:

- Frequent moves make long cable runs slow to redeploy and vulnerable to damage.
- Concurrent test streams increase WLAN load and the risk of latency or packet loss.

## Solution:

EKI-6333BE-4GD bridges the mobile ATE and analytics center in AP/client modes. Tri-band connectivity adds capacity for concurrent streams, while four 2.5GbE ports support local wired equipment.



## Benefits:

- Move ATE without rerouting long shop-floor cables
- Centralize eye-diagram and BER analysis in real time
- Carry concurrent avionics, structural, and RF test streams

## WHY WI-FI 7 HERE

Tri-band capacity supports continuous live traffic and high-volume station offload within one T2G (Train-to-Ground) architecture.

**20 sec**  
Station Offload

**Uninterrupted**  
CCTV Streaming

**+50%**  
Incident Response Efficiency

*Deployment Location: Urban Tram Network, Nordic Region*

## Overview:

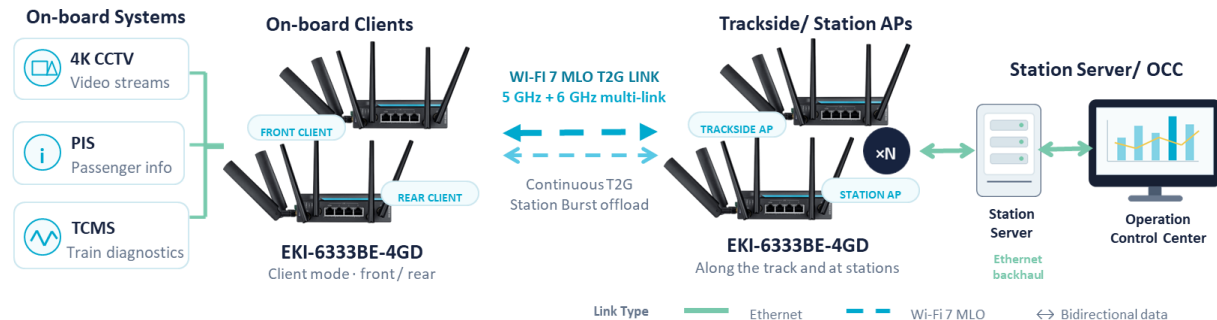
The tram continuously exchanges video, passenger information, and train-health data with trackside infrastructure. During short station stops, it also offloads trip records and logs.

## Challenges / Requirements:

- Repeated AP handoffs occur at reported train speeds of 50-70 km/h.
- Crowded urban spectrum and short station dwell times constrain high-volume offload.

## Solution:

EKI-6333BE-4GD connects onboard systems to trackside and station APs. Tri-band connectivity supports continuous T2G traffic and burst offload; roaming performance still depends on client behavior and RF design.



## Benefits:

- Maintain operational video and telemetry between stations
- Reuse one wireless path for T2G traffic and station offload
- Complete high-volume record and log offload during short station stops.



AI MODIFIED

*Deployment Location: High-Bay Warehouse, Europe*

## Overview:

A 60,000 m<sup>2</sup> site includes 12 m steel racks, more than 100 AMRs, and hundreds of handhelds, scanners, CCTV devices, and printers. This environment creates severe RF shadowing and high peak traffic.

## Challenges / Requirements:

- Metal racks create severe RF shadowing and multipath.
- Reported roaming delays above 200 ms caused AMR safety stops, while high-bay cabling increased cost and deployment time.

## Solution:

Wired root APs connect to the WMS over a 2.5GbE backbone. EKI-6333BE-4GD mesh nodes extend coverage into hard-to-wire zones, using 6 GHz for RF-planned backhaul and 2.4/5 GHz for existing clients. Mesh nodes require local power but no Ethernet uplink.

## WHY WI-FI 7 HERE

Wi-Fi 7 adds value in the mesh backhaul rather than legacy client links. A dedicated 6 GHz backhaul reduces data cabling while maintaining compatibility with existing 2.4 and 5 GHz endpoints.

**2 mo → 1.5 wk**

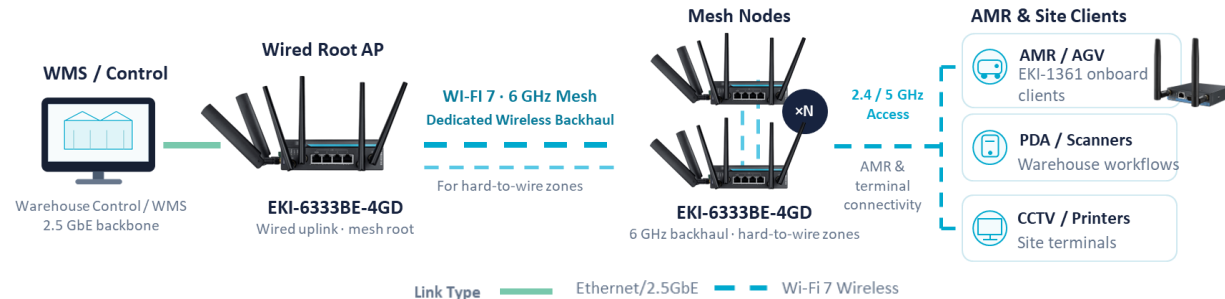
Deployment Time

**–65%**

Installation Cost

**+35%**

Orders per Hour



## Benefits:

- Extend coverage without wiring every high-bay node
- Preserve 2.4/5 GHz access for legacy AMRs and handhelds
- Add capacity through a dedicated, RF-planned backhaul

# Built for High-Bandwidth Industrial Workloads

Overcoming traditional wireless bottlenecks in bandwidth-intensive and latency-sensitive industrial environments.



## Deterministic Wi-Fi 7 Connectivity

- Tri-band MLO (2.4/5/6 GHz) and 2+2+2 MU-MIMO deliver up to 5.8 Gbps.
- Leverages clean 6 GHz spectrum for ultra-high throughput and stable, deterministic connectivity.

## Intelligent Network Operation & Management

- Simplifies large-scale wireless deployment through integrated NMS and OTA updates.
- Enables centralized monitoring, diagnostics, and maintenance optimization.

## 24/7 Industrial Reliability

- Operates in -40 to 75°C with a rugged metal enclosure and fanless design.
- Dual 12–48 VDC inputs ensure stable, continuous operation in harsh environments.

## Industrial-Grade Security Compliance

- Supports IEC 62443, CE RED, WPA3, and encrypted SNMP.
- Ensures secure and reliable connectivity for industrial control systems.

# Validate the Fit Before You Deploy

Every industrial site has different RF conditions, endpoints, traffic loads, and mobility requirements. Share the inputs below so Advantech can assess deployment feasibility, recommend the right topology, and define measurable acceptance criteria.

## 01 Site, RF & Infrastructure

Floor plan, materials and obstructions, mounting restrictions, available power and Ethernet, existing network requirements, and local 6 GHz availability.

## 02 Endpoints & Compatibility

Device types and quantities, supported Wi-Fi standards and bands, client drivers and firmware, antenna configuration, and roaming or MLO support where applicable.

## 03 Traffic & Mobility

Application data flows, peak and aggregate throughput, concurrent client count, movement speed and routes, and required transfer or offload windows.

## 04 Target KPIs

Coverage and signal quality, throughput, latency, jitter, packet loss, roaming interruption, and required offload volume and time.

### A Site Validation Can Help Confirm

- RF coverage and interference conditions
- AP and client roles, node placement, and backhaul topology
- Endpoint compatibility and expected performance
- Clear pass or fail criteria for the target application

### Discuss Your Wi-Fi 7 Deployment

Share your site requirements with our team to assess feasibility and recommend the right topology.

**Request a site validation**



ADVANTECH

# Industrial Wi-Fi 7

Unlocking 6GHz Spectrum for Uninterrupted,  
Seamless Connectivity



EKI-6333BE-4GD Access Point

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