Industrial Wireless Solutions Success Story eBook

6 x Industries | 19 x Wireless/Boards/Systems Cases

Advantech Industrial Wireless
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Advantech's Industrial Wireless (AIW) Solutions provide a wide range of wireless technology including Wi-Fi 5/6/6E, 4G LTE, 5G NR, GPS/GNSS, and Bluetooth. Our solutions are divided into four series adaptable to diverse connected platform applications in the AIoT era.
Wireless Market Focus and Star Solutions

Wi-Fi 6, Wi-Fi 6E
Multiple O/S

4G LTE, 5G NR
Multiple Form Factor

GPS/ GNSS
High Precision

RF Antenna & Wireless Software

- Wi-Fi roaming for AGV applications
- Enhanced positioning accuracy for GNSS
- Auto reconnection for cellular systems
Public Transportation

Application
Wi-Fi technology fulfills multiple functions in public transportation. In such applications, Wi-Fi needs to be sustainable while covering a wide range with excellent connectivity. It also needs to efficiently provide data to stations for passengers and tracking systems.

Benefits
• The correct interaction of these components and the design of a network mobility solution address latency issues
• Global certification supports worldwide use and saves on design fees when adapting solutions to different countries
Smart Railways

Application
Recent years have seen increasing demand for smart railway transportation across many countries. Consequently, train control and signaling technology — including high-quality communications, high-capacity passenger and train operations communications — have also increased. There has also been increasing demand for predictive maintenance and other comparable solutions.

Benefits
• High-speed transmission rates (exceeding 10Gb/s) will enable reliable onboard wireless connection without cuts to improve traveler experiences — even in events with mass communication and numerous IoT devices.
• Millisecond-level low-latency provides real-time operation and traffic forecasts with artificial intelligence while improving critical environment railway communications.
Railway Remote System Control

Application
Transportation systems need to deliver correct data to guarantee safety with minimal downtime. AIW industrial modules meet these demands and accommodate the wide temperature ranges found in rolling stock and railway applications.

Benefits
- Worldwide certification empowers multinational railway systems
- Wide-range temperature support accommodates diverse railway applications
Electric Charging Stations

Application
This electric charging station uses 4G LTE to connect charging stations to local utility companies and network providers. Doing so helps users monitor charging status, station-to-station communication, data exchange, and other measures.

Benefits
- Wide operating temperature support
- Stable connection supports remote update in unattended areas
- Easy software integration process.
- Cost effective carrier certification support (AIW-346FQ-N01)
Public Bike Service

Application
Public transportation agencies seeking to leverage bike rental systems need to take the number of bikes, stations, and the control centers into consideration. Wireless technology reduces the cost of these systems and increases their usage. Advantech’s AIW-344 LTE Wireless Modules deliver wide temperature support and stable connectivity to public bike rental systems.

Benefits
• Reliable solution via ARK-2230L and 4G LTE AIW-344
• Solution based selling eases Design-in process
City Surveillance System

Application
This solution saves supervision costs in inaccessible, dangerous circumstances/environments—including forest-fire prevention, and flammable & explosive materials monitoring. This improves safety while increasing responsiveness during incidents.

Benefits
• High-speed transmission rates (exceeding 10Gb/s) improve the transmission speed of existing surveillance video systems
• Millisecond-level low-latency enables intelligent security, remote real-time control, and advance early-warning capabilities
Geothermal Well Remote Monitoring System

Application
Remotely monitor geothermal well water level, intake, return flow, and temperature within geothermal mining units. Empower geothermal well remote control to save water and energy.

Benefits
- Stable connection across wide outdoor areas
- Wide operating temperature support for applications in harsh environments
- Long product life cycle support
- Easy software integration processes

Smart City

ARK-1220F
DIN-Rail Fanless Computer

AIW-344
Full-size mini-PCIe

Microsoft
Visualization Solution

Application
Visualization solutions can track people and gather data over extended periods of time. AIW-166K1 provides the high-performance needed to track people and upload data to the cloud immediately. This is an excellent solution for future digital demands.

Benefits
- Processes data in real-time, provides AI analysis, and uploads data to the cloud
- Stable connection enhances big data processing
- Easy maintenance accommodates routine actions

Smart Retail
Admin

DS-085
Ultra-slim Digital Signage

AIW-166K1
M.2 2830 E key
Retail Robot Wireless AI Notification System

Application

The EWM-W193M201E wireless module is an excellent choice for use in autonomous retail robot solutions. When the robot moves along the aisle, the scanner can scan goods on the shelves and detect problems — such as stock, price, and/or product issues. Once detected, the data will be transmitted to backend servers and then to the central system. Doing so notifies the staff, enabling them to correct issues as they arise. In this way, wireless modules support complicated actions.

Benefits

• Supports fast receiver Automatic Gain Control (AGC) with synchronous and asynchronous control loops among antennas, antenna diversity functions, and adaptive transmit power control functions. Doing so engenders better performance in the analog portions of the transceiver.
• Provides simple legacy, 20MHz/40MHz/80MHz coexistence mechanisms to ensure backward and network compatibility.
Quick-service Restaurants

Application
Quick-service restaurants increasingly provide self-ordering devices that support prompt orders at peak times and record customer information. The combination of AIW-166K1/K2 wireless modules and Edge Visualization Solution (EVS), enable customers to complete ordering by themselves. In addition, restaurants can deliver advertisements and analyze basic customer information (such as age, gender, etc.).

Benefits
• Wide spectrum bandwidth enables Wi-Fi devices to achieve faster speeds and lower latency
• Worldwide certification supports different frequencies
• Real-time transmission speed supports 4K digital video streaming on diverse devices
Warehouse AGV

Application

AGV vehicles need management systems that complete missions or tasks — including navigation and orders. This solution saves labor costs, reduces mistakes, and improves safety. These features are playing an important role in manufacturing warehouses and facilities.

Benefits

• Supports roaming functions, switching connection to workable devices
• Economic combo kit, makes passing certification and tests easier
• Good performance helps save time and resources
Manufacturing Robotic Arms

Application
Advanced factory equipment often uses Wi-Fi to complete multiple functions and tasks. It also helps establish safety and efficiency for labor in the factory operation.

Benefits
- Reliable and secure Linux environment eases factory automation infrastructure
- Easy software integration process
- Add-on service for WW RF certification

RSB-3720
2.5" SBC

i.MX8M Plus

Wi-Fi/BT

AIW-165
M.2 2830 E key
Industrial Boiler System

Application
Large boiler equipment requires attention beyond routine checks and occasional glances at the pressure gauge. This solution uses the combination of an AIW-344 LTE module and RISC-based box computer. This combination enables the real-time monitoring of the water pressure within the heating system via a central control room.

Benefits
- Provides real-time collection and monitoring of pressure data
- Enables remote control management to keep boiler pressure levels within standard tolerances
- High throughput LTE module enables precision computer to achieve high transmission speed with low latency
Automatic Water Pump Control

Application
Reliable pump controllers are essential for maintaining desired levels of water within water management systems. Automatic water pump controllers can do this with remarkable precision using Advantech’s EWM-W193H01E module. This solution also enables users to set and engage pumps remotely.

Benefits
- Build an enhanced signal detector, an adaptive frequency domain equalizer, and a soft-decision Viterbi decoder to alleviate severe multi-path effects and mutual interference in the reception of multiple streams
- Collect sensor data and trigger equipment action automatically
Ultrasound System

Application

Hospitals and clinics need powerful systems for analysis and examination. Such systems achieve accurate diagnosis and augment emergency/critical-disease procedures. The data goes through the Wi-Fi system and is delivered to the hospital system for future tracking. This design paradigm is becoming an essential part of medical devices.

Benefits

- Worldwide certification, global market plan without limitations
- Supports low energy state, and Bluetooth low energy to accommodate medical devices.

SOM-5892
Computer On Modules

EWM-W193H01E
Half-size Mini-PCIe

Medical
Blood Management System

Application
Blood centers need blood management systems for taxonomy. These systems reduce mistakes by helping to maintain blood quality and save its related data. Such solutions are becoming more prominent as parts of medical devices.

Benefits
• Highly-accurate performance reduces mistakes
• Supports wireless authentication privacy infrastructure
• Low latency accelerates data delivery rates
Medication Dispensing System

Application
A medical vending machine for automated medication dispensing cabinets requires a high-performance, reliable wireless connection and design. This device is reliable for complicated and precise jobs, improving user safety.

Benefits
• Product longevity commitment
• Peripheral integration service for cables and antennas
• Bundle recommendation — including mainboard and Wireless solutions

Medical vending machine

AIMB-286G2
Mini-ITX Motherboards

AIW-192K1
M.2 2230 A-E Key
Military D-Fend Solutions

Application
Anti-drone defense for urban and/or sensitive environments requires the use of wide temp Wi-Fi modules. Anti-drone solutions also need to provide stable performance during connection to reduce mistakes and losses.

Benefits
- These solutions need to avoid the extreme disruption of civil communication signals
- They need to automatically and passively detect, locate, and identify rogue drones
- They need to passively and continuously scan for and detect unique communication signals
Drone Applications

Application
This solution provides high-throughput 2.4GHz frequency for UAVs used in logistic delivery. The low latency connection improves destination stability to reduce issues related to lost connection and/or tracking.

Benefits
- Wide temperature support
- Easy software integration process
- Add-on service for WW RF certification

RSB-3720
Single Board Computer

AIW-165
M.2 2830 E key

Wi-Fi/BT
Regional Service and Customization Centers

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Worldwide Offices

Asia Pacific

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