

ADVANTECH

Enabling an Intelligent Planet

Industrial Wireless Solutions Success Story eBook

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

ADVANTECH

AIWireless

Advantech Industrial Wireless

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Transportation



AGV



Medical



Smart
Lighting

ADVANTECH AIWireless

Advantech Industrial Wireless



Bridge



Construction



Aquaculture



Logistics



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



Flexible Logistic
Supply



Longevity
Support



Industrial
Grade



Reliable and
Secure



Wi-Fi 5/ Wi-Fi 6/ Wi-Fi 6E

AIW 100 Series



GNSS/GPS

AIW 200 Series



LTE Cat.1/4G/5G

AIW 300 Series



BLE 5.2

AIW 400 Series

Wireless Market Focus and Star Solutions

Transportation

Medical

Kiosk

Automation

AGV

Defence



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



AIW-163
Linux
Windows 10



AIW-165
Linux



AIW-166K
Linux
ubuntu®
Windows 10

4G LTE, 5G NR Multiple Form Factor

coming soon



AIW-342
M.2 3042 Key B/
SIM Slot



AIW-343
Full-sized
mini-PCIe/
SIM Slot



AIW-355
M.2 3052
Key B

GPS/ GNSS High Precision

coming soon



AIW-210
M.2 2242 Key B



AIW-220
Half-sized mini-PCIe

RF Antenna & Wireless Software



AIW-166K1

AIW-211

AIW-344

- 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.

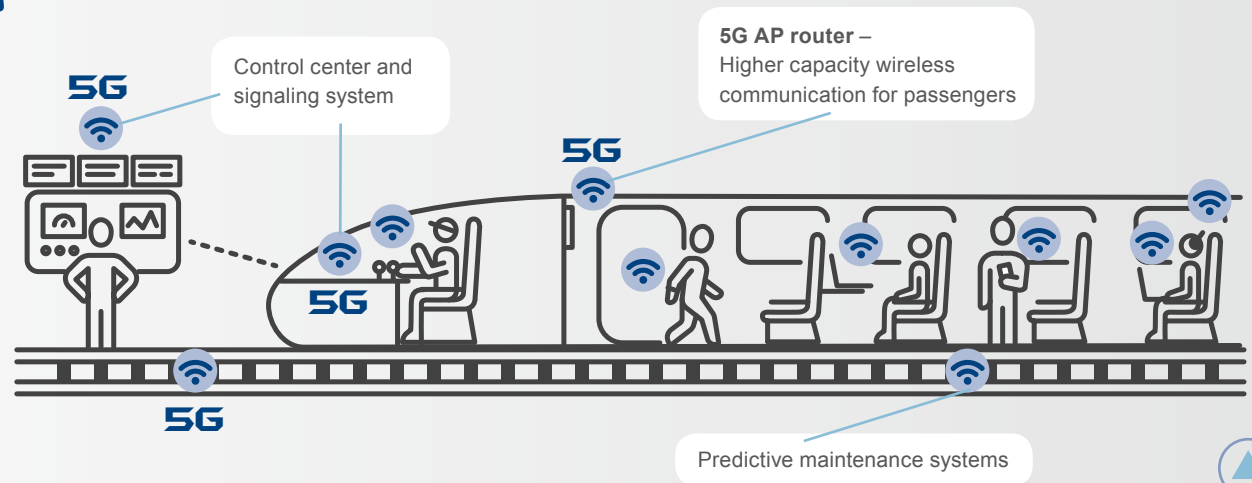
Benefits

- 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.



AIW-355
M.2 3052
Key B

5G



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



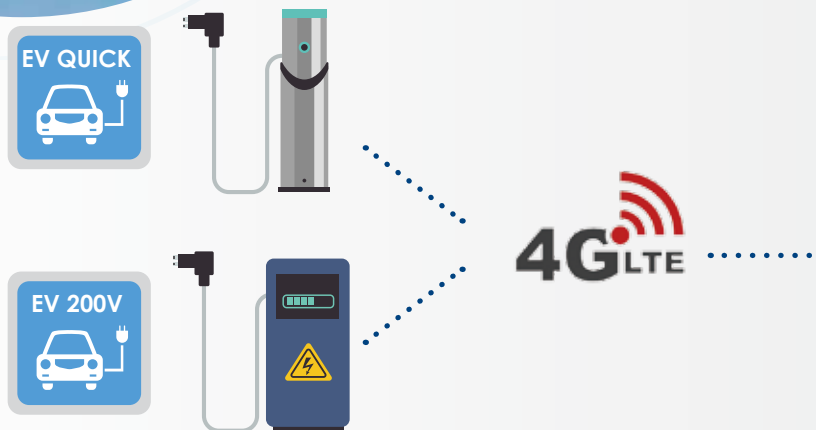
Electric Charging Stations

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)



ARK-1551

Slim Fanless
Computer



AIW-346FQ-N01

M.2 3052 Key B



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



ARK-2230
Modular Fanless
Computer



AIW-344
Full-size mini-PCIe



City Surveillance System

Application

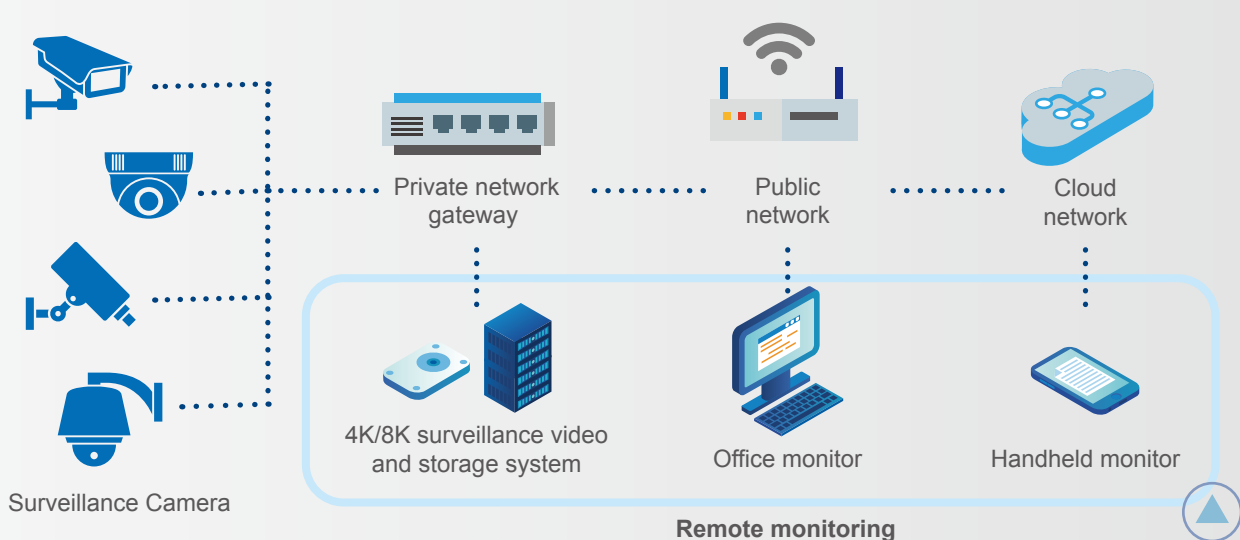
This solution saves supervision costs in inaccessible, dangerous circumstances/environments — including forest-fire prevention, and flammable & explosive materials monitoring. This improves safety while increasing responsiveness during incidents.

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

AIW-355
M.2 3052
Key B

5G



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



ARK-1220F
DIN-Rail Fanless
Computer



AIW-344
Full-size mini-PCIe



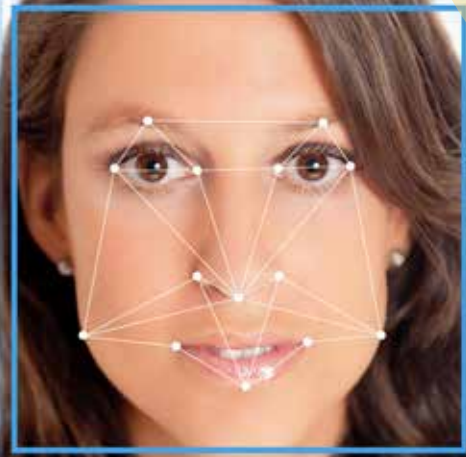
Visualization Solution

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.

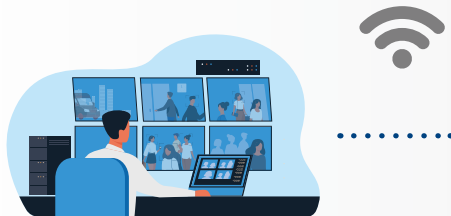
Benefits

- 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

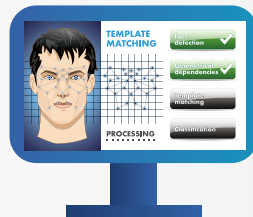


IDENTITY PROTECTION

Name:
Password:
phone:



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.

WISE-DeviceOn

ADVANTECH
Edge-X



Scanner

USB
.....
USB



EI-52
(in robot)



EWM-W193
Half-size mini-PCIe

Wi-Fi
.....
MQTT



Backend Server

Wi-Fi
.....
MQTT



Staff's Mobile



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



Internet



DS-085

Ultra-slim Digital Signage



AIW-166K1

M.2 2830 E key

M2

WiFi 6

Bluetooth 5



Mobile Device



Tablet Device



User
Analysis



Data Center
Server



Advertisement
Broadcast





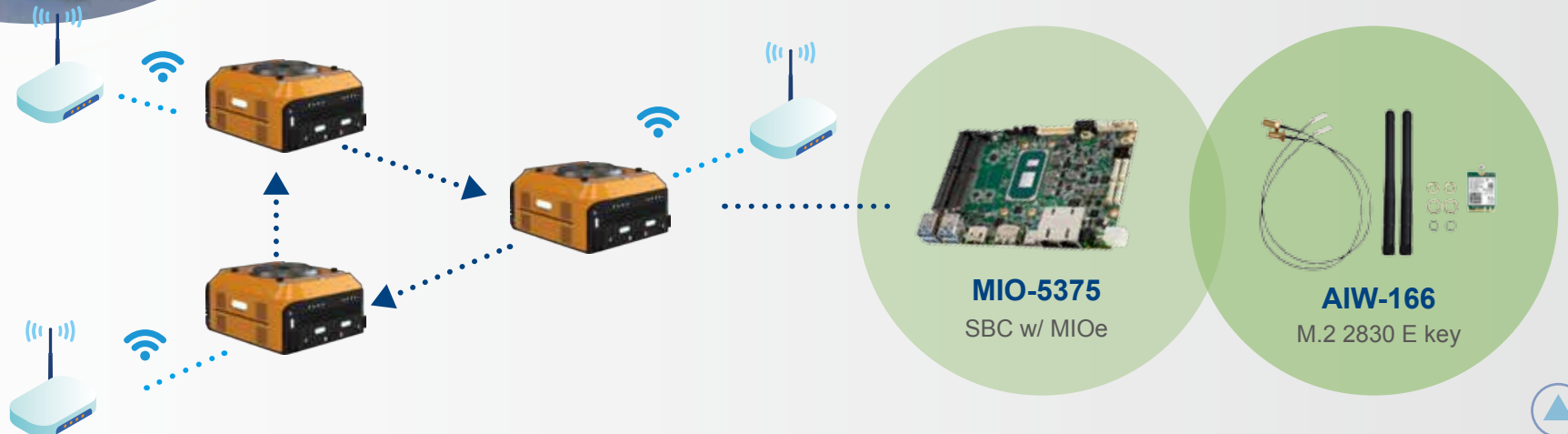
Warehouse AGV

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

i.MX8M Plus



RSB-3720
2.5" SBC

Wi-Fi/BT



AIW-165
M.2 2830 E key





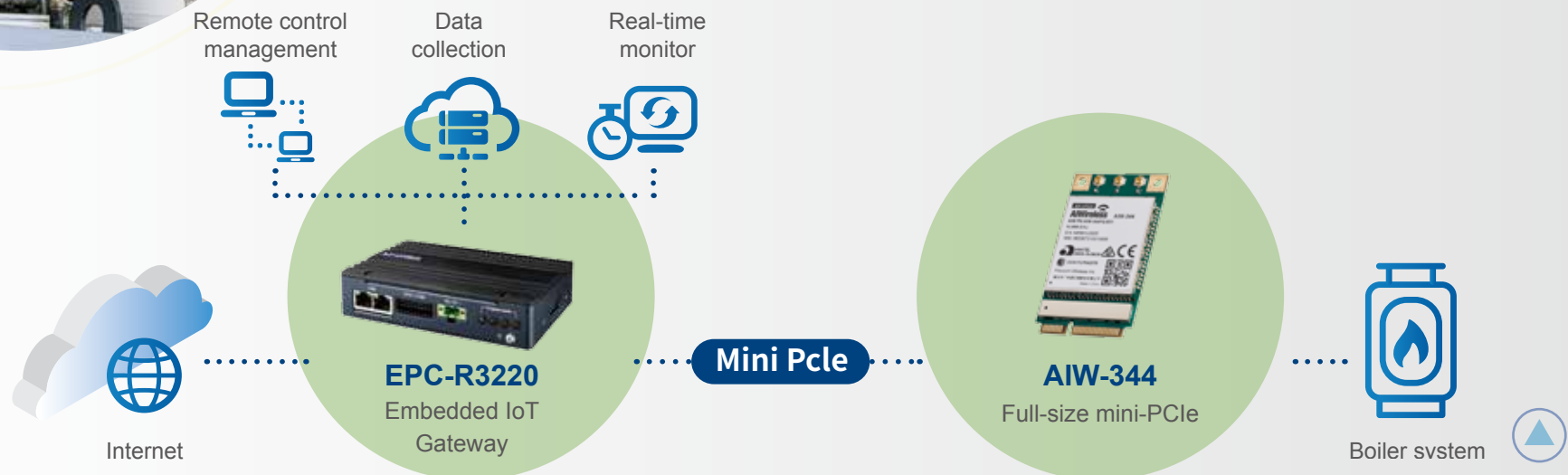
Industrial Boiler System

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



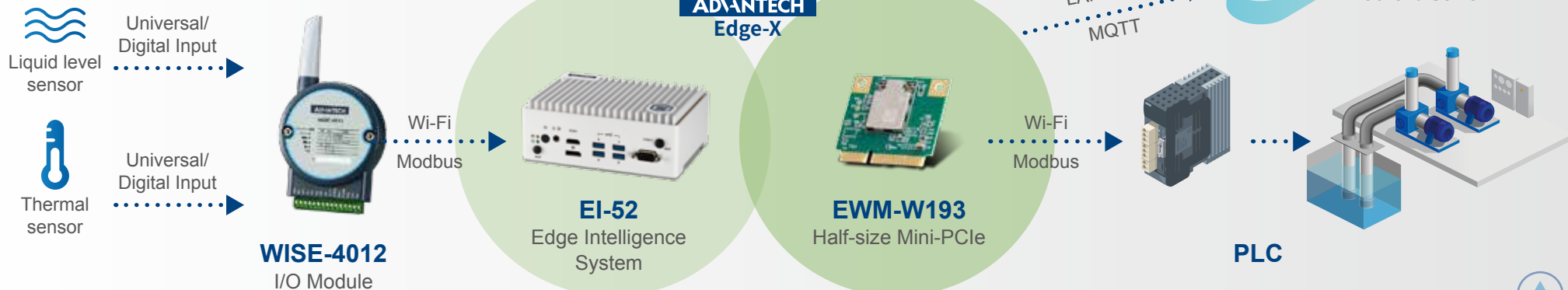
Automatic Water Pump Control

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-PCle



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

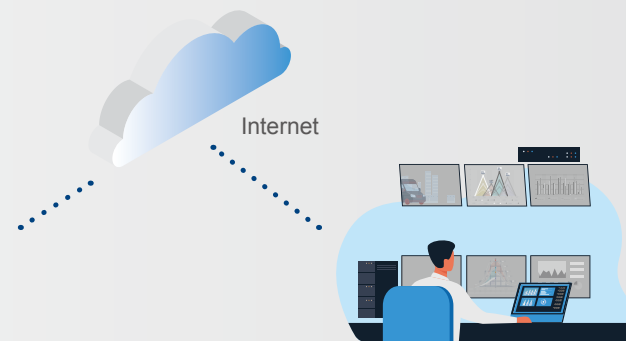
- Highly-accurate performance reduces mistakes
- Supports wireless authentication privacy infrastructure
- Low latency accelerates data delivery rates



SOM-7568
Computer On
Modules



EWM-W193H01E
Half-size Mini-PCIe



Management center



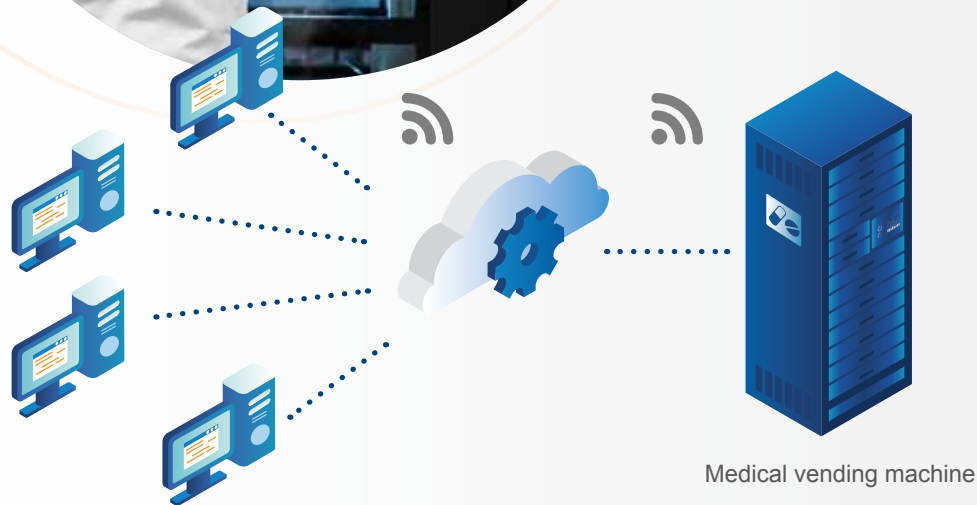
Medication Dispensing System

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



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.

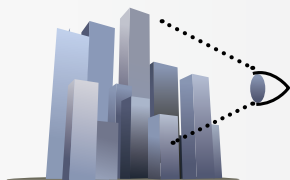
Benefits

- 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

Flying Object False Positives



No Clear Line-of-Sight



Signal Disruption



Collateral Damage



Wi-Fi/BT



AIW-154

M.2 2230

E Key





Drone Applications

Application

This solutions' 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

i.MX8M Plus



RSB-3720

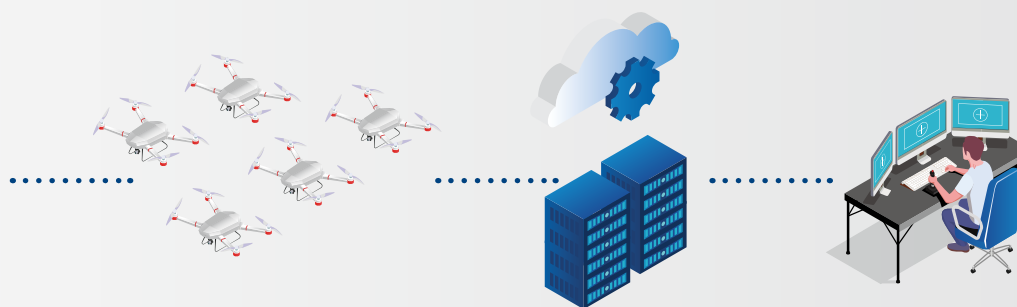
Single Board
Computer

Wi-Fi/BT



AIW-165

M.2 2830 E key





WiFi 6
CERTIFIED

WiFi 6E
CERTIFIED

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

4G LTE **5G**

4G LTE, 5G NR
Multiple Form Factor

GPS **GNSS Compare**
Research lab in your pocket

GPS/ GNSS
High Precision

Design-in Service

RF Antenna &
Wireless Software

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