

AIW-163BR Sales Kit



E-IoT

AIW PM

Alice.Liu

2022/Q3



Industrial Wireless Solutions

Wireless Edge Networking Innovations in Manufacturing



Industrial Grade



Longevity Support



Flexible Logistic Supply



Reliable & Secure

ADVANTECH
AIWireless
Advantech Industrial Wireless



GNSS Compare
Research for your system



Design-In Service

Wi-Fi 6, Wi-Fi 6E
Multiple OS Support



AIW-163
Linux
Windows 10

AIW-165
Linux
Windows 10

AIW-166K
Linux
ubuntu®
Windows 10

4G LTE, 5G NR
Multiple Form Factors



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



AIW-210
M.2 2242 Key B

AIW-220
Half-sized mini-PCIe

RF Antenna &
Wireless Software



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

Why do you need to upgrade to Wi-Fi 6?

**High
Bandwidth**
1024-QAM
8x8 MU-MIMO

Large Capacity
OFDMA
MU-MIMO

Low Latency
OFDMA
Spatial Reuse

**Low Power
Consumption**
TWT
20 MHz-Only



AIW-163: New Wi-Fi 6 Solution



AIW-163BR



Key Features

- Wi-Fi 6 + BT 5.2
- RTL8852BE
- PCIe + USB
- M.2 2230 A-E Key
- 0 ~ 70 °C

Certification

EU/FCC/IC/Telec/South
America/Russia/ASEAN/
Australia/New Zealand...

OS Support

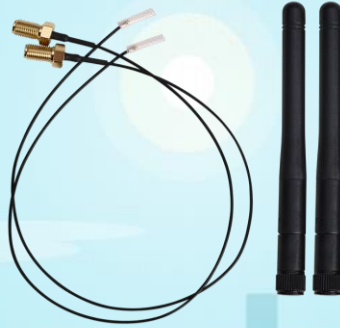
- Windows
- Linux



Selection Items

Cable Selection

- Cable (MHF4)
- (1) 1750007965-01: 30cm
 - (2) 1750008653-01: 20cm
 - (3) 1750008799-01: 17cm
 - (4) 1750008800-01: 10cm



(2.4GHz + 5GHz) Dipole antenna Spec

1750008717-01	
Frequency	2400 - 2500 MHz 5150 - 5850 MHz
Connector Type	SMA Male Reserve
Operation Temperature	-40 ~ 65°C
Polarization	Linear



Wi-Fi 6 Technology in Automation

Application:

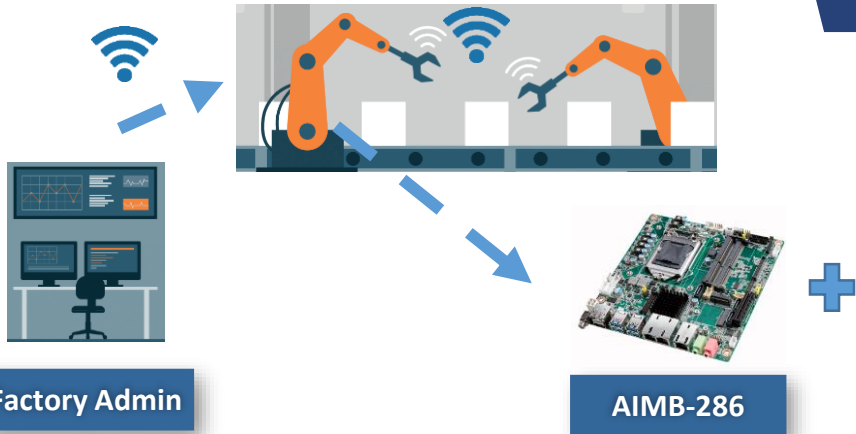
Automation needs a management system to do missions or tasks such as processing and assembly lines. This solution saves labor cost, mistake, and improve safety. Therefore, it's becoming an important role in manufacturing facilities.

Requirement about Wireless:

Good connection in working time, reducing mistake times for high production rate.

Data rates can speed up higher than before.

High transmission rate, reducing interference in the complex environment.



Wi-Fi 6 Technology in Ultrasound Machine



Application:

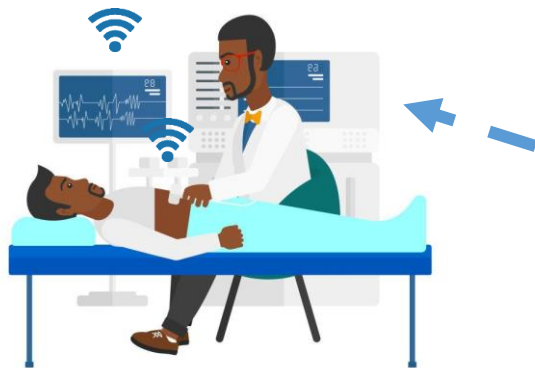
Modern Medical equipment has to use Wi-Fi 6 to do multiple functions and works because the cover range and connectivity are wide and sustainable. Moreover, in order to establish safety and efficiency, AIW-163BR Wireless Module can reach this target.

Requirement about Wireless:

The cover range is larger than before, helping a hospital to deliver data to the management system.

Obtain almost global certification, saving R&D time to create new modules for special countries.

Attain high performance, reaching product and safety obligations.



MIO-5376



AIW-163BR

Wi-Fi 6 Technology in Signage Players



Application:

Digital signages can be delivered information through AIW-163BR Wi-Fi 6 wireless module, keeping the data always running on time and correctly. From this point of view, the data rates and less delay time this product advantage parts for retail display application.

Requirement about Wireless:

With Less delay time, processing data can work very well. Obtain almost global certification, saving R&D time to create new modules for special countries. Easy to install, standard size in M.2 2230 A-E key.



Why AIW?

	Competitor A	Competitor B	Competitor C	Advantech
Target market	Embedded, non-commercial	Embedded, non-commercial	Consumer market	Embedded, non-commercial
O/S support	60% Windows 40\$ Linux	20% Windows 80% Linux	90% Windows 10% Linux	50% Windows 50% Linux
Longevity	Middle	Middle to Long	Short to Middle	Middle to Long
Product focus	Focus on Single technology	Focus on Single technology	Focus on Single technology	Multiple technology support
Price range	Middle to High	High	Low	Middle to High
Tech support level	Key account based	Key account based	Key account based	High
Certification	Multiple countries	Multiple countries	Multiple countries	Multiple countries Certification Kit*
Easy integration package	Customer source mainboard on their own	Customer source mainboard on their own	Customer source mainboard on their own	Easy integrated with Advantech Mainboard



Time to market



Design-In Service

Design-in service



Certification service



Integration recommendation



Advantech Embedded Wireless Design-in Service

Wireless connection SW

Driver and application

- Driver support for multi OS
- Customized wireless connection tool development

System performance

System + module + antenna

- Wireless throughput report
- Field test
- Platform compatibility test



RF certification service

Customized service

- Set up the RF test related SW and tool
- Pre-test at Advantech RF Lab
- RF certification related issues support
- RF certification report review

Embedded PIFA antenna

Customized design

- Antenna placement
- Antenna type selection
- Antenna radiation report
- Antenna isolation report
- Antenna efficiency report



Vertical Integration Service

Experienced IPC solution provider

iFactory
Inno Talks, Industrial IoT Insights, Monthly Video On Demand

iHealthcare
Patient-Centered Care Enhancement through Hospital Workflow Optimization

iLogistics
Trusted Driving Safety Solution Enhances Fleet Safety and Driver Behavior Monitoring

Intelligent Transportation Systems
Integrated Railway Solutions Buildup Modernized Infrastructure

Industrial Equipment Manufacturing
Enhance Customer Experience with Interactive and Stylish Wayfinding Kiosk

Software and certification support

FCC **CE** **ETSI** **GCF** **PTCRB**

WiFi **Bluetooth**

Transmit Spectrum CFEM (Based on 802.11g)
Power Spectral Density
Frequency (MHz)

Power Spectral Density
Frequency (MHz)

Power Spectral Density
Frequency (MHz)

Power Spectral Density
Frequency (MHz)

Global service network

- Design Centers
- Manufacturing Centers
- Configure To Order Service Centers
- Logistics Centers
- Onsite Service
- System Repair Centers
- System & Board Repair Centers
- Show Rooms

Locations: Milpitas, Irvine, Cincinatti, Monterrey, Rajuba, Eindhoven, Munich, Amberg, Warsaw, Beijing, Kunshan, Bangalore, Singapore, Melbourne, Moscow, Seoul, Tokyo, Taipei, Bangkok, Penang, Singapore, Melbourne, Headquarters

Design in service

Training

Board Bring up

Remote Support

Hardware Testing and Validate

Total Solution Provider

Wireless Marketing Package

[eNews] Wi-Fi 6

eBrochure

Solution eBook

Application eBook Feature Article

Wireless Kits eDM

Advantech Industrial Wireless Solutions

New Product High-light

NEW AIW 100 Series / AIW-166K

Main chipset: Intel® EE AX210
Form factor: M.2 2230 A-E Key
Operating temp: -40~85°C / -40~185°F
OS: Windows, Linux, and Chrome

Bluetooth, Wi-Fi 6E, M.2 2230, 5G, 4G LTE, USB-C

FAQ

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[Sales Kit Download](#)

Market Trends

Turkey trials will GC to lay foundations for a commercial future
10G-Tbps could reduce delay to the nanosecond and this is for demand that 5G-E
Industrial performance benefits for its capabilities as well as its massive data
rate capacity.
(Jun 15, 2023) | [Business](#), [SmartCity/Smart Home](#) | [View More](#)

What Wi-Fi 6E means for the future of the iPhone
As Intel, 5G are standard versions of 5G/4G-E best feature access to the new 5G/5G-E
frequency band... This new frequency could be a huge deal and will make a major
impact on the future of wireless connectivity.
(Mar 16, 2023) | [Business](#), [Japan](#) | [View More](#)

Wi-Fi 6E Networking And Why You Should Care With Intel Special
Guidance
Let's explore some 5G/4G-E best feature and what it enables, with some examples to
help. Starting with the introduction of the Wi-Fi 6E standard, China
Communications Group, Chinese State-owned Wireless Solutions Group and 5G
(Mar 16, 2023) | [Business](#), [WiFi/Networks](#) | [View More](#)

Advantech Industrial Wireless Solutions
Robust Performance with Ultimate Reliability for Industrial Applications

Technological Breakthroughs
Product Series
Design-in Services
Global R&D
Case Studies

AIWireless
Advantech Industrial Wireless

Industrial Grade
Modular Design
Flexible Config. Support
Proven Logic Support

Wireless Design-in Services

ADVANTECH
Enabling an Intelligent Planet

[www.advantech.com](#)

Meet the Next Generation of Wireless Technology

Accurate Positioning with 5G and Wi-Fi 6E

AIWireless
Advantech Industrial Wireless

Advantech Industrial Wireless Solutions (AIW)

5G, Wi-Fi 6E, 4G LTE, 3G, 2G, 1G

PN-8600000563

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Edge Intelligence Solution Guide

Edge+ Overview
Edge+ AI & Intelligence Solutions
Edge+ AI & Intelligence Solutions
Edge+ AI & Intelligence Solutions

Industrial Wireless Solutions

Advantech Industrial Wireless Solutions (AIW)

5G, Wi-Fi 6E, 4G LTE, 3G, 2G, 1G

PN-8600000562

[View Online](#)

Industrial Wireless Solutions Success Story eBook

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

AIWireless
Advantech Industrial Wireless

Wireless Market Focus and Star Solutions

4G LTE, 5G, Wi-Fi 6E, 3G, 2G, 1G

5G or Wi-Fi 6E: Finding the Best Solution for Your Workplace

ADVANTECH
INNOVATIVE TECHNOLOGIES

PN-8600000579

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SPEED-TO-MARKET
Fully Certified Industrial Wireless Kits

Advantech Industrial Wireless Kits adhere to globally recognized standards — including FCC, CE-RED, and IC — enabling the rapid development of AIoT business. They integrate cables, antennas, and modules within one package to reduce the time to market.

Join FREE Online Webinar

Certificate-Ready
Open, agile and fully certified

High Availability
Integrated package meets diverse needs

Cost Efficiency
Reduces time and cost

[Learn More](#)

Wi-Fi and BT Wireless Kits

EWM-W192-K1K2 [Buy Now](#) **4G LTE EWM-C186-K1** [Buy Now](#)

Wireless Modules

Wi-Fi 5 2T2R M.2 2230 Wireless Module [Learn More](#)
4G LTE Cat4 Module [Learn More](#)
Wi-Fi 5 2T2R half-sized Wireless Module [Learn More](#)

AIW-152 [Learn More](#) **AIW-344** [Learn More **EWM-W190** \[Learn More\]\(#\)](#)

[View Online](#)

[View Online](#)

Wireless Marketing Package

AIW Landing Page

The landing page features the Advantech AIWireless logo at the top. Below it, the main headline reads "The Next Generation of Industrial Wireless Technology" with the sub-headline "Robust Performance with Ultimate Reliability". There are four icons representing "Industrial Grade", "Longevity Support", "Reliable and Secure", and "Flexible Logistic Supply". A "Contact Us" button is on the right. Below this is a "Menu" section and a section titled "About Advantech Industrial Wireless" with a grid of icons. At the bottom, there is a "View AIW Story" button and a navigation bar with "HOME", "PRODUCTS", "SOLUTIONS", "SERVICES", and "CONTACT US".

[View Online](#)

[eNews] June Issue

The eNews cover features the Advantech AIWireless logo and the headline "Advantech Industrial Wireless Solutions". It highlights "5G Connectivity", "AIoT", and "Wi-Fi 6". Below this is a section for "Ecosystem Collaboration" with the text "See the Next Generation of Wireless and Embedded Technology". A "June 2021" badge is in the top right. The main content area includes a "View eVite" button and a "Register & Join Roundtables" button. Below is a table of featured products:

Ready	EW18-W205	Ready	EW18-W169
Chipset: NXP 88100987	Chipset: NXP 88100987	Chipset: NXP 88100987	Chipset: NXP 88100987
WiFiBT: IEEE 802.11ax + BT 5.0	WiFiBT: IEEE 802.11ax + BT 5.0	WiFiBT: IEEE 802.11ax + BT 5.0	WiFiBT: IEEE 802.11ax + BT 5.0
Form Factor: M.2 2230	Form Factor: M.2 2230	Form Factor: M.2 2230	Form Factor: M.2 2230
Temp: -30 ~ 85 °C	Temp: -30 ~ 85 °C	Temp: -30 ~ 85 °C	Temp: -30 ~ 85 °C

Below the table is a section for "Fibocom Webinar Series" with the headline "Make the 5 G's Thrive" and a "Know More" button. At the bottom, there is a "Market Trend Sharing" section featuring "AIW-155 Launched on RUTRONIK 24 in Europe" with a "Know More" button.

[View Online](#)

Press Release

The press release cover features the Advantech AIWireless logo and the headline "AIW 166K Series AIW-166K". Below this is the sub-headline "The Next-gen Wi-Fi 6E Wireless Kit". There is a "June 2021" badge in the top right. The main image shows the AIW-166K product and its packaging.

Accelerate Wireless Edge Networking Innovations
 Designed for AGV Applications and Medical Devices

Key Features

- IEEE 802.11ax
- 4x 2000 MHz
- 160 MHz channel bonding
- 1024-QAM
- 4x 2000 MHz channel bonding
- 1024-QAM
- 4x 2000 MHz channel bonding
- 1024-QAM

[View Online](#)

Wi-Fi 6E eNewsletter

The eNewsletter cover features the Advantech AIWireless logo and the headline "Advantech Industrial Wireless Solutions". It highlights "5G Connectivity", "AIoT", and "Wi-Fi 6". Below this is a section for "New Product High-Light" with the headline "Why Wi-Fi 6?". There is a "Aug 2021" badge in the top right. The main content area includes a "Market Trend Sharing" section with the headline "EU Boosts 6GHz Spectrum for Wi-Fi 6E" and a "Marketing Packages" section.

[View Online](#)

Hot Videos

The video cover features the Advantech AIWireless logo and the headline "What is AIW?". There is a play button icon in the center.

[What is AIW?](#)

The video cover features the Advantech AIWireless logo and the headline "Edge+". There is a play button icon in the center. Below the headline are images of various AIW products.

[AIW Star Products](#)

The video cover features the headline "QUICK WIRELESS TECHNOLOGY FACTS" with a play button icon. Below the headline are images of three people wearing face masks.

[Wireless Top 10 Q & A](#)

Download link

- **AIW Landing page :**

https://my.advantech.com/Includes/GetTemplate.aspx?RowId=0dc5f2cf62&utm_source=MailBee&utm_medium=eDM&UID=20fGIA5AvZlI

- **AIW brochure:**

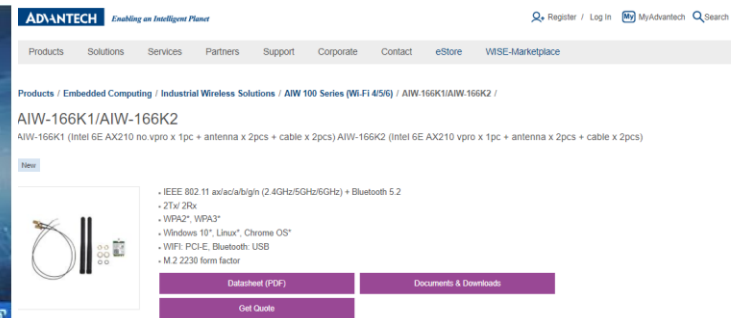
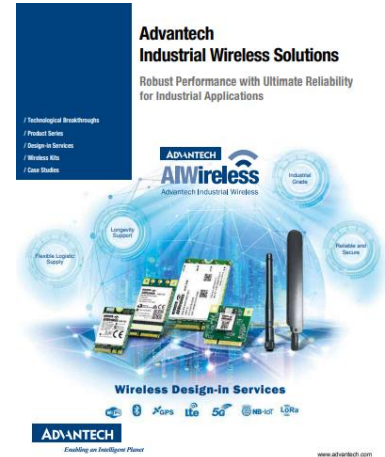
https://advcloudfiles.advantech.com/ecatalog/2021/05141005.pdf?utm_source=MailBee&utm_medium=eDM&UID=J0sXebkkzKH4&utm_source=MailBee&utm_medium=eDM&UID=20fGIA5AvZlI

- **AIW-163 data sheet:**

https://www.advantech.com/products/1-2r51yz/aiw-163/mod_dfe6ce2d-bc11-4205-83d4-03ae7b452822

- **AIW video**

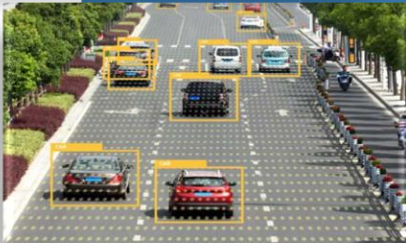
<https://campaign.advantech.online/en/AIW>



Appendix



Past Wi-Fi Comparison



Wi-Fi 5 (802.11ac)	Item	Wi-Fi 6 (802.11ax)
Single user support (OFDM)	AP capacity	Multiple user support (OFDMA)
4 - 8	AP spatial streams	8
2.4GHz & 5GHz	Frequency band	2.4 GHz & 5GHz
6.9 Gbps	Max data rate	9.6 Gbps
Downlink	MU-MIMO	Uplink and Downlink
256 QAM	Highest Modulation	1024 QAM
WPA2	WPA	WPA3

- * **OFDMA** : Allows one transmission to deliver data to multiple devices at once.
- * **WPA 3**: Makes it harder for hackers to crack passwords by constantly guessing them.

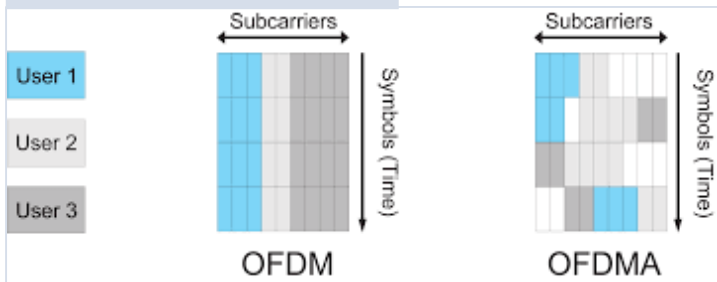
Future Wi-Fi Comparison

Item	Wi-Fi 6 (802.11 ax)	Wi-Fi 6E (802.11 ax)	Wi-Fi 7 (802.11 be)
Launch date	2021	2022	2023 Q4 (expected)
Bands	2.4GHz & 5GHz	2.4GHz & 5GHz & 6GHz	1 ~ 7.25 GHz
Security	WPA3	WPA3	WPA3
Channel Size	20, 40, 80, 80+80, 160 MHz	20, 40, 80, 80+80, 160 MHz	Up to 320MHz
AP modulation	OFDMA	OFDMA	OFDMA (with extensions)
MU-MIMO	8 x 8 MU-MIMO	8 x 8 MU-MIMO	16 x 16 MU-MIMO

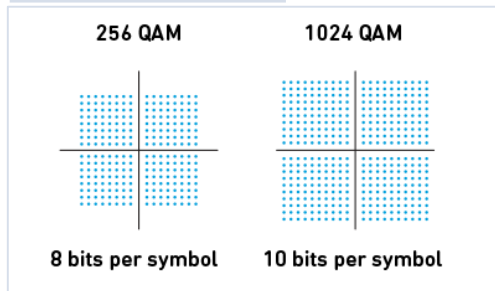


Quick Highlight on Wi-Fi 6 (11ax)

Allow more device to connect



25% higher capacity



AP Spatial reuse

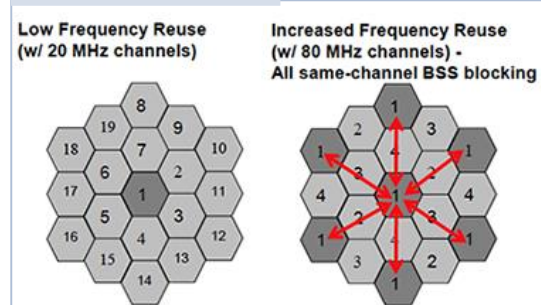


Image: Aruba Networks

Increase data transaction rate

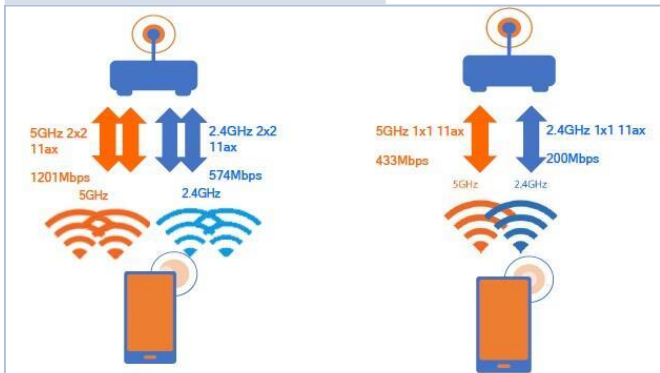


Image: eettaiwan.com

Better user experience

Reasonable AP resource allocation

Higher capability, Higher speed

Decrease package loss rate

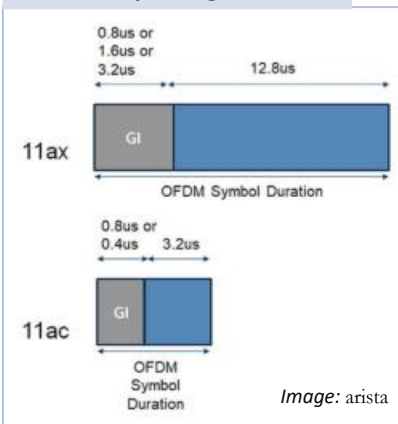
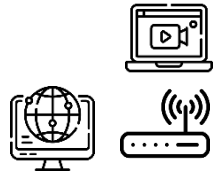


Image: arista

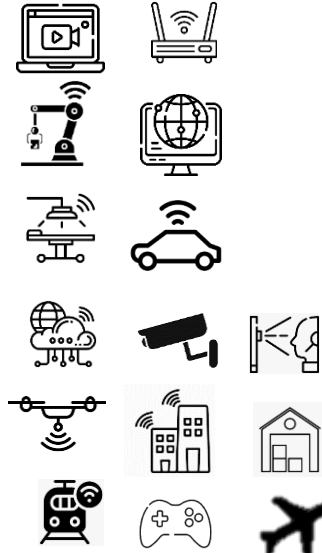
Industrial Wi-Fi Application Milestone



- **2009 (Wi-Fi 4)**
 IEEE 802.11 a/b/g/n
 (2.4GHz, 5GHz)



- **2014 (Wi-Fi 5)**
 IEEE 802.11 ac
 (2.4GHz, 5GHz)



- **2021 (Wi-Fi 6)**
 IEEE 802.11 ax
 (2.4GHz, 5GHz)



- **2022 (Wi-Fi 6E)**
 IEEE 802.11ax
 (2.4GHz, 5GHz, 6GHz)



- **2023 (Wi-Fi 7)**
 IEEE 802.11 be
 (2.4GHz, 5GHz, 6GHz)

Wireless Module Certification List

Country

Armenia	Aruba	Australia & New Zealand	Azerbaijan	Bahamas	Barbados	Belarus	Botswana	Brazil
Benin	Bermuda	Bolivia	Burkina Faso	Burundi	Cameroon	Cape Verde	CB	CE
Chad	China	Comoros	Congo	Cambodia	Central Africa	Costa Rica	Cote	Djibouti
Ecuador	Egypt	Equatorial Guinea	Ethiopia	Fiji	Gabon	Gambia	Ghana	Guinea
Guinea-Bissau	Haiti	HK	Honduras	IC-Canada	India	Indonesia	Israel	Jamaica
Japan	Jordan	Kuwait	Kyrgyzstan	Lebanon	Lesotho	Madagascar	Malawi	Malaysia
Mali	Mauritania	Moldova	Morocco	Mozambique	Namibia	Nepal	Netherland	Niger
Nigeria	Oman	Pakistan	Papua	Paraguay	Peru	Philippine	Qatar	Rep. Dominican
Russia	Saudi Arabia	Senegal	Serbia	Singapore	South Africa	South Korea	Switzerland	Taiwan
Thailand	Tunisia	UAE	Uganda	UK	Ukraine	USA-FCC	Vietnam	Zimbabwe