ADVANTECH

Enabling an Intelligent Planet

AIW-163BR
Sales Kit

E-IoT

AIW PM

Alice.Liu

2022/Q3

Industrial Wireless Solutions

Wireless Edge Networking Innovations in Manufacturing

80°C
-40°C
Industrial Grade

Longevity Support

Flexible Logistic Supply

Reliable & Secure

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AIWireless
Advantech Industrial Wireless

Wi Fi 6 CERTIFIED
Wi Fi 6E CERTIFIED
4G LTE
5G
GNSS Compare
GPS
Design-in Service

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

AIW-163 | AIW-165 | AIW-166K

Linux Windows 10 | Linux | 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

AIW-166K1 | AIW-211 | AIW-344

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

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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

Robot

Industrial

Medical

AIW-163BR

ADVANTECH AIWireless Advantech Industrial Wireless | Wi Fi 6 | 5.2

FC CE KC

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

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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:

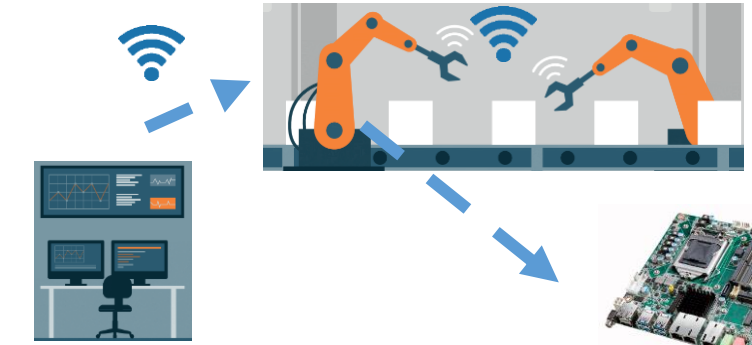
Automation needs a management system to do missions or tasks such as processing and assembly lines. This solution saves labor cost, mistake, and improve safety. Therefore, it's becoming an important role in manufacturing facilities.

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.



Factory Admin

AIMB-286

AIW-163BR

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Wi-Fi 6 Technology in Ultrasound Machine

Application:

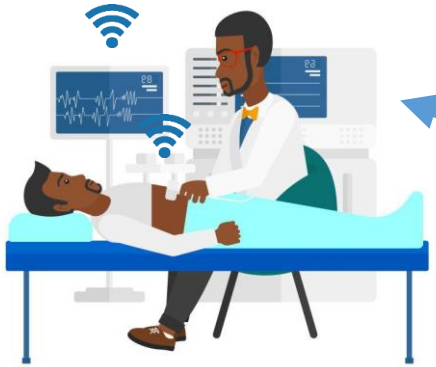
Modern Medical equipment has to use Wi-Fi 6 to do multiple functions and works because the cover range and connectivity are wide and sustainable. Moreover, in order to establish safety and efficiency, AIW-163BR Wireless Module can reach this target.

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

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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.

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Why AIW?

	Competitor A	Competitor B	Competitor C	Advantech
Targe 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**
- **Certification service**
- **Integration recommendation**

Advantech Embedded Wireless Design-in Service

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Advantech Industrial Wireless

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

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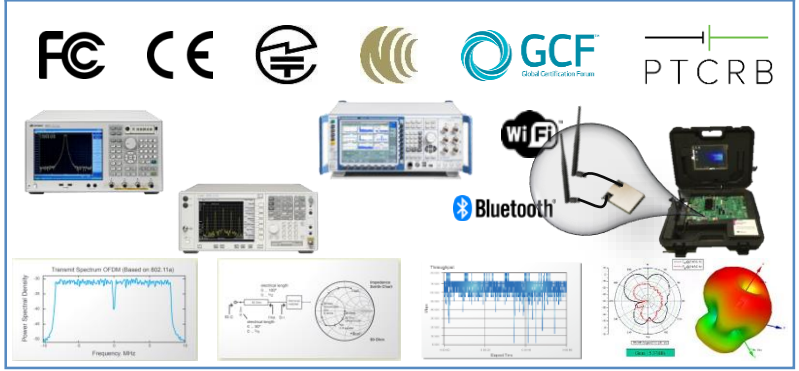
Advantech Industrial Wireless

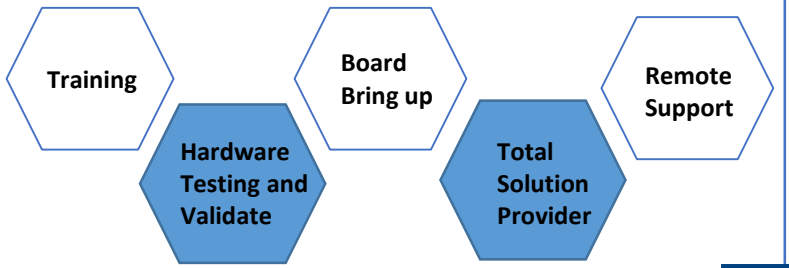
Experienced IPC solution provider

Software and certification support



Global service network

Design in service



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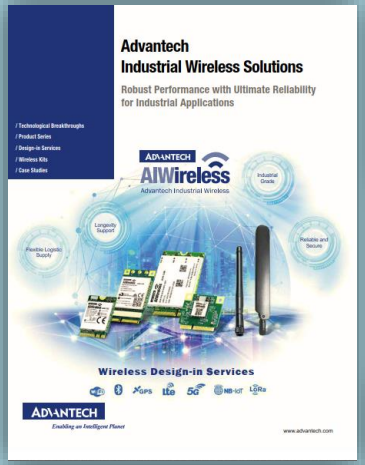
Wireless Marketing Package

[eNews] Wi-Fi 6

[View Online]

eBrochure



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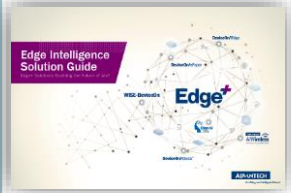
Solution eBook



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Application eBook Feature Article

PN-8600000579

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Wireless Kits eDM

[View Online]

Wireless Marketing Package

AIW Landing Page

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[eNews] June Issue

View Online

Press Release

View Online

Wi-Fi 6E eNewsletter

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Hot Videos

What is AIW?

AIW Star Products

Wireless Top 10 Q & A

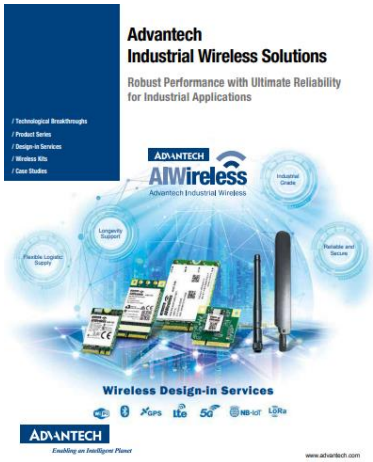
Download link

- **AIW Landing page :**

https://my.advantech.com/Includes/GetTemplate.ashx?RowId=0dc5f2cf62&utm_source=MailBee&utm_medium=eDM&UID=20fGiA5AvZli

- **AIW brochure:**

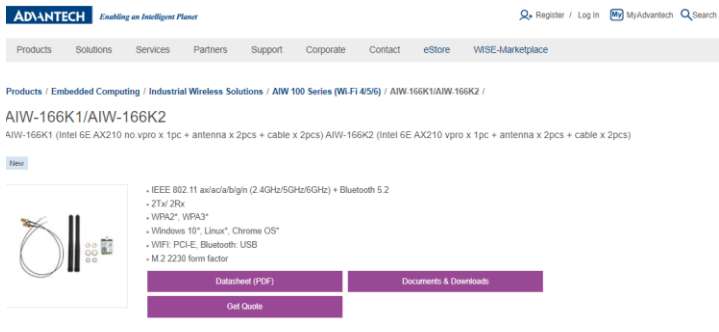
https://advcloudfiles.advantech.com/ecatalog/2021/05141005.pdf?utm_source=MailBee&utm_medium=eDM&UID=J0sXebkkzKH4&utm_source=MailBee&utm_medium=eDM&UID=20fGiA5AvZli



- **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

OEE
iWard Solution
Predictive Maintenance
M2I/CNC
WISE-PaaS EnSaaS
NB-IoT
Integrated UShop+
Machine to Intelligence
iWater Treatment
Solar Power
Co-Creation
共創
Intelligent Factory
WISE-PaaS Alliance
ADVANTECH
WISE-PaaS
IoT Edge Intelligence
Service IoT
Embedded IoT
IoT
iHospital
WISE-PaaS
IoT.SRP
INDUSTRY 4.0
NB-IoT
IoT.SENSE
iLogistics
UShop+
EdgeLink
EnSaaS
Intelligent Transportation
WebAccess
INTELLIGENT RETAIL
IoT Edge Intelligence
IoT.SRP

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

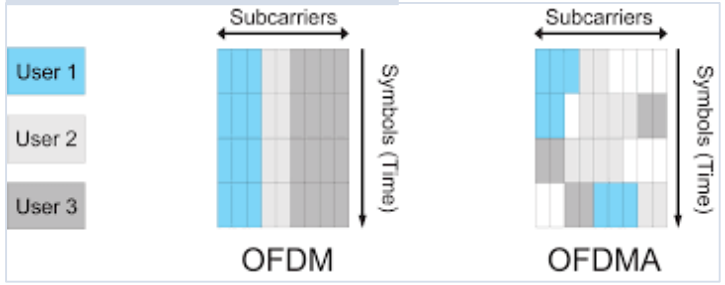
* **OFDMA :** Allows one transmission to deliver data to multiple devices at once.
* **WPA 3:** Makes it harder for hackers to crack passwords by constantly guessing them.

Future Wi-Fi Comparison

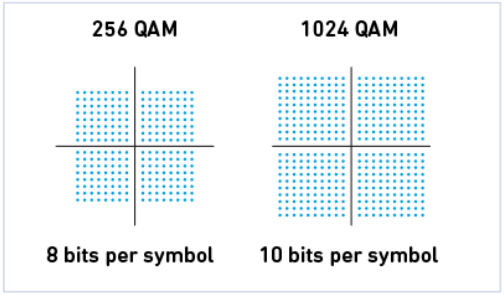
Item	Wi-Fi 6 (802.11 ax)	Wi-Fi 6E (802.11 ax)	Wi-Fi 7 (802.11 be)
Launch date	2021	2022	2023 Q4 (expected)
Bands	2.4GHz & 5GHz	2.4GHz & 5GHz & 6GHz	1 ~ 7.25 GHz
Security	WPA3	WPA3	WPA3
Channel Size	20, 40, 80, 80+80, 160 MHz	20, 40, 80, 80+80, 160 MHz	Up to 320MHz
AP modulation	OFDMA	OFDMA	OFDMA (with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

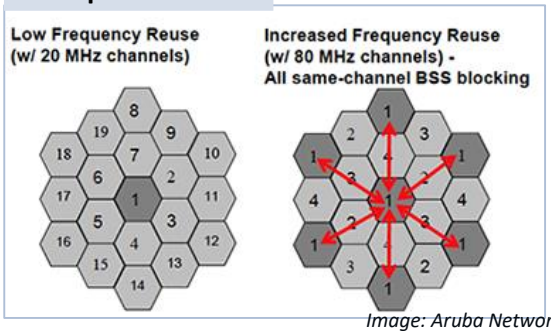


Image: Aruba Networks

Increase data transaction rate

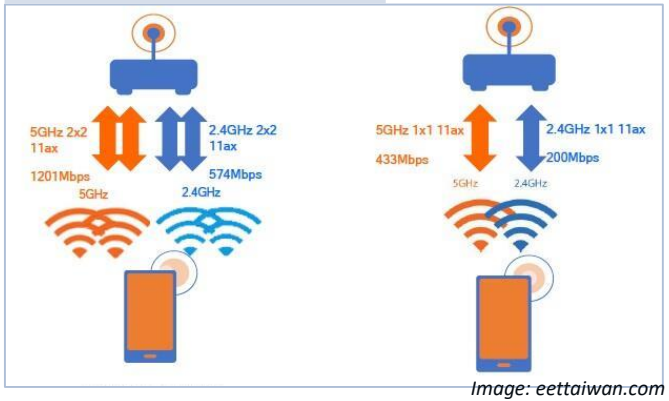


Image: eettaiwan.com

Better user experience

Reasonable AP resource allocation

Higher capability, Higher speed

Decrease package loss rate

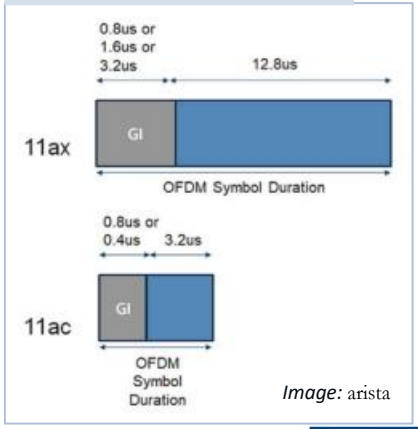
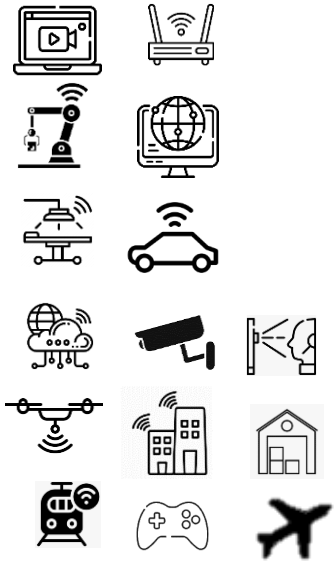


Image: arista

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

ADVANTECH AIWireless Advantech Industrial Wireless

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