

# Product Brief



Intel® Wi-Fi 6E AX210 Extended Temperature Industrial Module  
2nd Generation Wi-Fi 6 with Extended Wi-Fi 6E (6 GHz band) Support

# Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature (-40°C to +85°C) Industrial Module

High performance, high reliability Extended Temperature wireless solution for Industrial IoT always-on and always-connected applications such as Industrial PCs, HMIs, and Robotics.



The Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module is targeted for use cases and applications where the module has to operate all the time.

The Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module is ideal for always-on IoT applications such as Human-Machine Interfaces (HMI), Industrial PCs and robots and enables manufacturing, industrial, and other IoT customers to take advantage of artificial intelligence and inferencing at the edge via fast, reliable, and flexible connectivity.

The product supports dual-stream Wi-Fi in the 2.4GHz, 5GHz, and 6GHz bands, and includes improved TCP throughput and future Wi-Fi 6 R2 features, including UL MU-MIMO<sup>1</sup> that improves UL network capacity in dense environments. These new features maximize the benefits of Wi-Fi 6, including Gigabit speed, ultra-low latencies, and enhanced reliability benefits across new radio frequencies exclusive to Wi-Fi 6E devices, and deliver a significant improvement in user experience in dense deployments.

This module is designed to support upcoming Wi-Fi 6E technology and related Wi-Fi Alliance Wi-Fi 6E<sup>2</sup> certification.

## 2<sup>nd</sup> GENERATION INTEL Wi-Fi 6 WIRELESS WITH EXTENDED Wi-Fi 6E (6GHz BAND) SUPPORT

### Higher Activity Use Cases

Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial modules are targeted for use cases and applications where the module has to operate continuously and reliably in extended temperatures (-40°C to +85°C).

### Extended Temperatures

### Long-term Reliability

Long-life availability and long-life Intel Support for a future-proof platform for intelligent solution development.

### Excellent Support and Availability

### Stronger Security with WPA3\*

The Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial modules also feature the latest WPA3\* security that improves authentication and encryption while making connections even easier.

### Lower Latency

### Greater Network Flexibility

Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module supports legacy Wi-Fi 4, 5, 6, and Wi-Fi 6E, as well as Wi-Fi 6 Wave 2 features. By implementing the new Wi-Fi 6E technology supporting the new 6GHz band that includes 1200MHz of new contiguous spectrum (>2x compared to 5GHz) with more Gigabit Wi-Fi options and exclusivity to Wi-Fi 6 products, Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module enables greater network flexibility, faster downloads, sharing and backups as well as reduced latency and improved reliability.

### Faster Speed

### Reduced Latency

### Wi-Fi 6E Dual Band 2X2 160MHz

When using Wi-Fi 6 technology with 1024QAM and 160MHz channels, Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module can deliver nearly 3x higher peak data rates<sup>3</sup> (up to 2.4Gbps) and up to 4x capacity improvement in dense or congested environments compared to 802.11ac<sup>4</sup>.

### Bluetooth® 5.4

On top of existing features, Bluetooth® 5.4 includes the Isochronous Channel feature that lays the foundation for the implementation of the next generation of Bluetooth® Audio - Low Energy Audio. The Bluetooth® 5.4 Core specification also provides the capability to change the transmit power of the devices (local and peer) in order to improve the link quality while optimizing power consumption.

<b>Operating Systems</b>	Windows* 10 Enterprise Long-Term Servicing Channel (LTSC), Windows* 11 LTSC and Yocto Project*-based operating systems.
<b>M.2 2230 Form Factor</b>	The M.2 2230 form factor enables system configuration and platform usage flexibility with the use of a standard Key A or Key E socket to attach the module.

## EXPERIENCE THE INTEL® DIFFERENCE

<b>Worldwide Regulatory Support</b>	Enables performance-optimized worldwide regulatory compliance on a single adapter SKU. The Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module detects its location and automatically optimizes the Wi-Fi settings to local regulatory requirements, maximizing performance in each geography, simplifying global enterprise procurement. Future regulatory changes are easily managed during the product life cycle.
<b>Intel® Dynamic Regulatory Solution</b>	
<b>Wireless Functionality in Pre-boot Environment</b>	Support for Wi-Fi network and Bluetooth® Low Energy HID connectivity in the platform UEFI (Unified Extensible Firmware Interface) environment during its boot stage. This capability enables use cases like OS recovery over Wi-Fi and Bluetooth® Low Energy-based keyboard and mouse connectivity in this pre-boot environment.

## BUSINESS-CLASS WIRELESS

<b>Intel® vPro® Technology<sup>5</sup></b>	Supports Intel's hardware-based security and management features build into the Intel® Core™ vPro® processors and chipsets that enables IT to manage PCs virtually anywhere, anytime, while reducing deployment costs, improving security and ROI.
<b>Intel® Active Management Technology<sup>6</sup></b>	Using integrated platform capabilities and popular third-party management and security applications, Intel® AMT allows IT or managed service providers to better discover, repair, and help protect their networked computing assets. Intel® AMT is a feature of Intel® Core™ processors with Intel® vPro® technology.
<b>Built for IoT</b>	The Intel® Wi-Fi 6E AX210 (Gig+) Extended Temperature Industrial module combines long-life support and long-life availability, pre-validation on Intel IoT platforms, as well as wireless Intel® AMT to connect your embedded IoT platforms to other edge devices. Target Wake Time (TWT) is a feature that can be used to extend the battery life of remote Wi-Fi 6E sensors.

## INTEL® WI-FI 6E AX210 (GIG+) EXTENDED TEMPERATURE INDUSTRIAL MODULE TECHNICAL SPECIFICATIONS

### General

Dimensions (H x W x D)	M.2 2230 : 22mm x 30mm x 2.48mm [1.6mm Max (top side)/ 0.1mm Max (bottom side)]
Weight	M.2 2230 : ~ 3.2 +/- 0.2g
Radio ON/OFF Control	Supported
Connector In	M.2 : PCIe*, USB
Use Conditions	For details on Intel Industrial use conditions, please contact your Intel Account Manager
Operating Temperature	-40°C to +85°C
Humidity Non-operating	50% to 90% RH non-condensing (at temperatures of 25°C to 35°C)
Operating Systems	Microsoft* Windows* 10 Enterprise LTSC, Linux*
Wi-Fi Alliance <sup>7</sup>	Wi-Fi CERTIFIED* 6, Wi-Fi CERTIFIED* a/b/g/n/ac, WMM*, WMM*-Power Save, WPA2*, WPA3*, WPS*, PMF*, Wi-Fi Direct*, Wi-Fi Agile Multiband*, and Wi-Fi Timesync*
IEEE WLAN Standard	IEEE 802.11-2016 and select amendments (selected feature coverage) IEEE 802.11a, b, d, e, g, h, i, k, n, r, u, v, w, ac, ax; Fine Timing Measurement based on 802.11-2016, Wi-Fi Location R2 (802.11az) hardware readiness <sup>8</sup>
Bluetooth®	Bluetooth® 5.4
Availability and Support	Long-life availability Long-life Intel Support

### Security

Security Methods	WPA2*; WPA3*
Authentication Protocols	802.1x EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0 -MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA')
Encryption	128-bit AES-CCMP, 56-bit AES-GCMP

### Compliance

Regulatory	For a list of country approvals, please contact your local Intel representatives.
Product Safety	UL, C-UL, CB (IEC 60950-1)
US Government	FIPS <sup>10</sup> 140-2

**PRODUCT NAME****MODEL NUMBER****VERSION**Intel® Wi-Fi 6E AX210 (Gig+) Extended  
Temperature Industrial Module

AX210.NG.WG.II

Wi-Fi 6E (6GHz), 2x2, Bluetooth® 5.2, M.2 2230



For more information on Intel® Wireless products, visit [intel.com/wireless](https://www.intel.com/wireless)

<sup>1</sup> Wi-Fi 6 Uplink Multi-User MIMO (Multiple Input Multiple Output) supports up to 8 streams of UL data from multiple stations, improving UL network capacity in dense environments.

<sup>2</sup> Wi-Fi 6E WFA certification for AX210 was received in January 2021. Refer here: <https://api.cert.wi-fi.org/api/certificate/download/public?variantId=99375>.

<sup>3</sup> "Nearly 3x higher peak data rates" Intel® Wi-Fi 6 AX claims are based on the comparison of the expected maximum theoretical data rates for similarly configured 802.11ax and standard 802.11ac Wi-Fi solutions as documented in IEEE 802.11ax D4.0 spec and IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers.

<sup>4</sup> Wi-Fi 5 = 802.11ac. In accordance with the IEEE 802.1ax PAR. For additional details, visit: <https://mentor.ieee.org/802.11/dcn/14/11-14-0165-01-0hew-802-11-hew-sg-proposed-par.docx>.

<sup>5</sup> Intel® vPro® Technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software and IT environment. To learn more, visit: <http://www.intel.com/technology/vpro>.

<sup>6</sup> Requires activation and a system with a corporate network connection, an Intel® AMT-enabled chipset, network hardware and software. For notebooks, Intel® AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating, or powered off. Results dependent upon hardware, setup and configuration. For more information, visit: <http://www.intel.com/technology/platform-technology/intel-amt>.

<sup>7</sup> Support of Wi-Fi Alliance certification is OS-dependent.

<sup>8</sup> IEEE 802.11az hardware readiness per expected Wi-Fi Location R2 feature support and based on Draft 2.1 of the IEEE 802.11az amendment and is subject to change.

<sup>9</sup> Some security solutions may not be supported by your device operating system and/or by your device manufacturer or may require additional hardware (e.g., UICC - SIM card). Check with your device manufacturer for details on availability.

<sup>10</sup> On Microsoft® Windows® 10.

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