

# WiGig® and Health/Safety



WiGig CERTIFIED™ products will operate in the 60 GHz frequency band and deliver multi-gigabit speeds, low latency, and security-protected connectivity between nearby devices. Many WiGig CERTIFIED products are expected to be Wi-Fi CERTIFIED™ as well, and products implementing both WiGig® and Wi-Fi® will include mechanisms to facilitate seamless handover between the two technologies. This brochure is designed to answer questions about the health and safety aspects of WiGig technology, and to share the opinions of respected, public health institutions on this topic.





## About Electromagnetic Fields (EMF)

### What is WiGig?

A complementary technology to Wi-Fi, WiGig provides data rates up to 7 Gbps and is based on the IEEE 802.11ad standard, similar to Wi-Fi. Popular use cases for WiGig include cable replacement for popular I/O and display extensions, wireless docking between devices like laptops and tablets, instant sync and backup, and simultaneous streaming of multiple, ultra-high definition and 4K videos.

Electromagnetic Fields (EMF), also known as Electromagnetic Energy (EME), can best be described as waves of electric and magnetic energy moving together through space.

EME is emitted by natural sources like the sun, the earth and the ionosphere. Radiofrequency (RF) EME is emitted by artificial sources such as mobile phone base stations, broadcast towers, radar facilities, some types of remote control devices, and electrical and electronic equipment.

EMF is characterized according to frequency and wavelength in a continuum called the electromagnetic spectrum. The entire spectrum consists of radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays and gamma rays.

Radiofrequency EMF are considered non-ionizing radiation, defined as not able to directly impart enough energy to a molecule or atom to break chemical bonds or remove electrons. In contrast, ionizing radiation such as X-rays can strip electrons from atoms and molecules. This process produces molecular changes that can lead to damage in biological tissue.

## Protecting the Public



### **International exposure standards**

All radio-based technologies are subject to standards that limit human exposure to RF and ensure the safe use of the technology by users and the general public. Scientific knowledge and studies form the basis for the standards. The standards are reviewed and updated periodically to ensure they reflect knowledge from the most recent scientific research.

The International Commission on Non-Ionizing Radiation (ICNIRP) and the Institute of Electrical and Electronics Engineers (IEEE) developed RF exposure standards used today. They offer almost identical protection and form the basis of safety rules used by most countries in the world.

The exposure limits contained in the RF standards also include a built-in substantial margin of safety; the World Health Organization affirms that the safety margin takes into account all members of the population, including elderly and ill people, pregnant women, and young children.

All wireless products are required to be evaluated to ensure they comply with exposure limits and rules adopted by regulatory agencies of individual countries. For example, in the U.S. the Federal Communications Commission (FCC) is the responsible agency setting the rules for wireless products; in Europe each country's regulatory agency has responsibility but the Conformité Européenne (CE) mark demonstrates the overall product is compliant with country regulations. Specific country regulatory information is generally found in the product manual.

### **Scientific research**

In the past 50 to 60 years there has been a significant amount of scientific research to better understand the safe use of devices that use EME. The World Health Organization website notes that there have been more than 25,000 published articles during the past 30 years in the area of biological effects and medical applications of non-ionizing radiation.





Independent scientific organizations, public health agencies, and governments throughout the world regularly review the large body of research. The institutions all are consistent in their assessment that there is no established evidence of harmful effects from radio frequencies used at or below the established limits.

The volume of research about EME and its effects on human health informs experts about all the radio bands in the spectrum. To date, there is no scientific evidence suggesting that fields in the 60 GHz frequency range would behave any differently with exposures to humans or animals than the many other frequency ranges of RF fields that have been well studied.

Wireless industry organizations continue to monitor the research and the industry relies on the latest exposure standards, which reflect current scientific knowledge and consensus on the research.

## Key points

- Electromagnetic fields are relied on to provide many services we take for granted today such as TV and radio broadcast, mobile phones, electrical equipment and more. RF is considered non-ionizing which means by its very nature it cannot break chemical bonds.
- WiGig operates in the 60 GHz band, offering consumers and businesses the ability to transfer data at high speeds (up to 7 Gbps) and supports usages such as uncompressed video streaming, wireless docking, huge file transfers, instantaneous wireless backups
- All radio-based technologies, including WiGig, must meet international standards that limit human exposure to RF and are developed to ensure the safe use of the technology by users and the general public. These standards are science based, reviewed periodically and reflect the latest scientific knowledge.
- Independent scientific organizations, public health agencies, and governments throughout the world regularly review the large body of research. The institutions are consistent in their assessment that there is no established evidence of harmful effects from radio frequencies used at or below the established limits.

## About Wi-Fi Alliance®

Wi-Fi Alliance® is a global non-profit industry association—our members are the worldwide network of companies that brings you Wi-Fi®. The members of our collaboration forum come from across the Wi-Fi ecosystem and share a common vision of connecting everyone and everything, everywhere. Since 2000, the Wi-Fi CERTIFIED™ seal of approval designates products with proven interoperability, industry-standard security protections, and the latest technology. Wi-Fi Alliance has certified more than 23,000 products, delivering the best user experience and encouraging the expanded use of Wi-Fi products and services in new and established markets. Today, billions of Wi-Fi products carry a significant portion of the world's data traffic in an ever-expanding variety of applications.

### Where can I obtain more information on this topic?

To find out more information, visit any of the following websites:

#### **ICNIRP (International Commission on Non-ionizing Radiation Protection)**

[www.icnirp.de/](http://www.icnirp.de/)

#### **Wi-Fi Alliance**

[www.wi-fi.org/wi-fi-and-health](http://www.wi-fi.org/wi-fi-and-health)

#### **Wi-Fi Alliance, WiGig® and the future of seamless connectivity**

[www.wi-fi.org/file/wigig-and-the-future-of-seamless-connectivity-2013](http://www.wi-fi.org/file/wigig-and-the-future-of-seamless-connectivity-2013)

#### **World Health Organization, International EMF Project**

[www.who.int/peh-emf/project/EMF\\_Project/en/](http://www.who.int/peh-emf/project/EMF_Project/en/)

#### **World Health Organization, Radio Frequency fields: Environmental Health Criteria Monograph**

[www.who.int/peh-emf/research/rf\\_ehc\\_page/en/](http://www.who.int/peh-emf/research/rf_ehc_page/en/)

#### **World Health Organization, What are Electromagnetic Fields?**

[www.who.int/peh-emf/about/WhatisEMF/en/index1.html](http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html)

