

What is a wireless or Wi-Fi network?

More and more wireless technologies make their way into our homes; you could call them the little brothers of the big mobile phone networks whose antennas can be found on many houses. Apart from making phone calls, wireless systems are now primarily used for transmitting larger amounts of data. WLAN stands for Wireless Local Area Network, more often referred to as wireless or Wi-Fi, the latter being the trademark for one of the most common technologies. It allows users to surf the Internet or send e-mails from their home computer, laptop, or PDA without any tangle of wires, and this wireless access is becoming increasingly available in public places outdoors, in urban centers, hotels, or airports. By now there are tens of thousands of public access points - so-called Wi-Fi hot spots - available worldwide, and that in addition to many commercial networks e.g. in office buildings.



Wireless Network



Wireless Network

Internet without Wires



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What does building biology have to offer?

The building biology environmental consultants from the BUILDING BIOLOGY ASSOCIATION (VB) are experts in identifying and reducing environmental risks in indoor environments. They measure, analyze, and assess Wi-Fi networks in addition to many other factors, including mold, indoor toxins, and other physical exposures from e.g. mobile phones, DECT cordless phones, and radioactivity, air quality and indoor climate. They also make recommendations for remediations. Building biology environmental consultants help find and reduce disease-causing factors that often hide within our own four walls.

We are less interested in discussing or arguing about unreasonable exposure limits than in taking positive action.

Life is more satisfying when there are less stressors-as a precaution and to be on the safe side.

Your Building Biology Consultant
Member of the Building Biology Association e.V. (VB)

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The Building Biology Association (VB) follows the Standard of Building Biology Testing Methods SBM and works in cooperation with the Institute of Building Biology and Ecology IBN/Neubeuern (<http://www.baubiologie.de/site/english.php>). Comprehensive information on building biology can be found in Wolfgang Maes' book "Stress durch Strom und Strahlung" (German ISBN 3-923531-25-7).



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How does a wireless or Wi-Fi network work?

The Wi-Fi antenna in a DSL router (or in a separate Wi-Fi access point) radiates non-stop, whether data is transmitted or not. It does not make any sense, but unfortunately this is exactly what happens. With a critical ELF signal of 10 Hertz, this pulsed microwave radiation is blasted across the entire house, day and night, as soon as and for as long the device is plugged into an outlet. On top of that, wireless connective devices such as laptops or stationary computers with their integrated or insertable wireless cards certainly radiate when data is transferred, but often also when the computer is simply turned on. This makes for high RF radiation levels, which most of the time are absolutely unnecessary.

Why are such antennas not activated except when they are actually needed, e.g. for the short period of time during a data transfer, and then automatically deactivated as soon as not in use? This would have been easy to accomplish, but the technical developers did not consider the possibility. An automatic deactivation was deliberately shortchanged.

How do I recognize a wireless or Wi-Fi network?

The inconspicuous Wi-Fi antennas in the small rectangular or round plastic housings may hide next to any telephone jack, sometimes even in bedrooms. They are usually easily recognized by their short antennas.

How far does its wireless radiation reach?

Within a radius of only a few meters around the Wi-Fi antennas, RF radiation levels are about 1,000 $\mu\text{W}/\text{m}^2$, which is comparable to those found at a distance of a few dozen or even over 100 meters from a mobile phone base station. In the context of mobile phone radiation, the German Medical Association has already issued warnings for such levels, for which also changes in brain wave activity or other biological effects are documented. Without any impeding building materials in-between, Wi-Fi radiation levels may still be above 5 $\mu\text{W}/\text{m}^2$ at a distance of 50 m, which is not acceptable from a building biology perspective (especially, Wi-Fi radiation was found to be critical at levels around 0.1 - 1 $\mu\text{W}/\text{m}^2$ according to past building biology testing experiences). Any solid



masonry wall or concrete ceiling reduces RF levels by about 50-80 %, wood-frame wall constructions, however, provide hardly any reduction.

Are there official statements concerning Wi-Fi?

Harsh criticism, position papers, and warnings are being issued by building biology environmental consultants, scientists,

medical doctors, and even by official agencies in Germany and other countries: "The German Government warns against the use of wireless networks. They should be avoided at home." The Federal Agency of Radiation Protection recommends to avoid the use of wireless networks at work and at home. In order to keep one's personal radiation exposure as low as possible, it is suggested to prefer wired connections. Because of their RF radiation emissions, the City of Frankfurt am Main and the Education and Sciences Union (GEW) refuse to use Wi-Fi networks in all Frankfurt schools, they warn against health risks and prefer wired technologies. Four libraries in Paris turned off their wireless networks. Many employees had complained about headaches, dizziness, nausea and fatigue after the wireless networks had been installed. The Bavarian Board of Education advises schools not to use Wi-Fi, calling on Bavarian schools to do without such wireless Internet access. The reduction of radiation exposures in classrooms is a priority.

Where can wireless networks be found?

From a building biology perspective, the problem has become rather acute over the past few years when Wi-Fi devices started to show up in ever increasing numbers in ordinary living spaces: a Wi-Fi antenna is almost always hidden in a DSL router or laptop (which most users are not even aware of). The idea: Anybody should be able to easily surf the Internet anywhere at home or on the go, not only in the office but in the living room and garden too. The whole thing is amazingly attractive especially because there is no need to run new wires through the house, no holes, no dust, no mess.

Are wireless or Wi-Fi networks unsafe?

Consumer protection centers warn against Wi-Fi. It makes use of microwave radiation just like mobile phones and cordless DECT phones.

The ZDF Consumer Magazine WISO clarifies: "Wi-Fi causes electromagnetic pollution. A Wi-Fi router or the base station of a cordless DECT phone do not belong on a bedside table or in a bedroom."

Dr. Gerd Oberfeld, environmental medicine expert of the Salzburg Government

(Austria), refers to Wi-Fi as a "radiation blaster". In the US, parents file the first lawsuits concerning Wi-Fi: "This type of microwaves causes severe health risks, especially in children."

Unfortunately, reality often looks completely different from those demands out there. Wi-Fi is scheduled to be everywhere: This is reason enough to try escaping it. Often it is up to oneself to simply be informed and pay attention.

How can I protect myself from Wi-Fi?

The following tips help to avoid or reduce your personal radiation exposure to wireless or Wi-Fi networks:

- Always prefer wired data transmission systems to wireless networks (even though you may have to run some wire), especially in residences, schools, and preschools...
- If at all, wireless networks should be run at the lowest possible power output actually required to get the work done (which usually can be set in the software).
- Have access points only transmit for the short period of time required to transfer data, otherwise keep it always turned off, especially during the night. Simply turn the switch at the Wi-Fi device off or, better yet, unplug it.
- Keep a preferably large distance (>10m) between areas of frequent human use and the transmitting antennas.
- Transmitting antennas should not be installed in the rooms they service but rather in hallways or less used rooms farther away.
- Also keep your neighbor in mind!
- Strategically place access point antennas in such a way as to minimize the radiation exposure in areas of frequent human use. Never connect sector antennas with high antenna gains (and their increased directivity) to access points and never point them towards areas of frequent human use.
- Laptop or PC: Keep your distance from the wireless card; if at any time larger amounts of data are transferred, leave the area. Always turn off the wireless card with a separate switch or disable it in the control panel (PC) or at the taskbar (Mac) when not in use.
- Perhaps rooms or walls could be specifically shielded if the wireless radiation comes from outside or a neighbor; though it is imperative to have a RF radiation survey conducted prior to any shielding project.

