

What is Wi-Fi?

Wi-Fi is a type of short range wireless communication that runs within a specific frequency range. It is often used at home to create a network for internet or printer access without the need for wiring. One thing to note is that despite being wireless, cell phones do not typically use Wi-Fi for cellular communication. They use a much lower signal frequency than their short range counterpart.

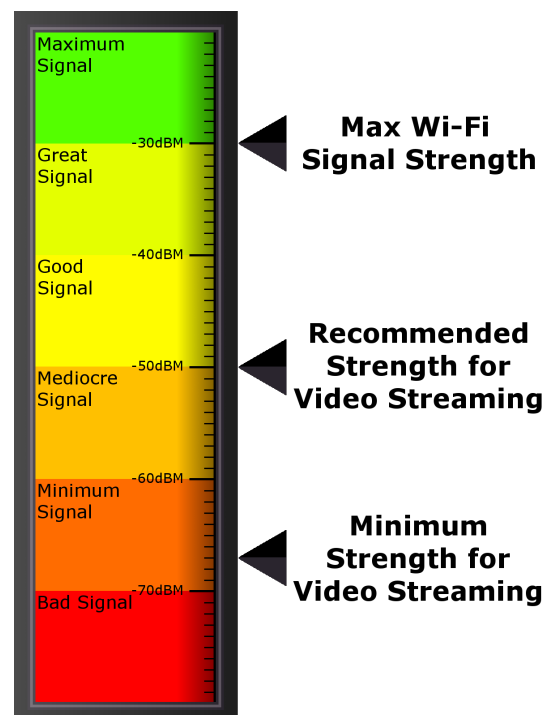
How is Wi-Fi signal strength measured?

One unit of measure for wireless signal strength is called dBm, or decibel milliwatt, and can be confusing at first glance. It is based on a logarithmic scale where higher dBm values coincide with better signal strength. Every 3 dBm or -3 dBm doubles or halves the signal strength respectively.

Note that in the case of Wi-Fi, these numbers are negative, which means the closer the value is to zero, the better the strength of the signal.

-30 dBm is considered a near perfect Wi-Fi connection, while anything below -70 dBm is often too unreliable to use.

For streaming video, -67 dBm is the bare minimum signal strength required. However, it is recommended to have at least -50 dBm or higher to stream video consistently.



What effects wireless signal strength?

Distance

For one, signal strength fades with distance. As you get further away from the origin of a wireless signal, the strength of it decreases. The effect of the decrease is different depending on the wireless frequency in use. Higher frequencies cover less area but allow for faster data transfer. Lower frequency signals work the opposite way, allowing you to transmit Wi-Fi signals further but with less bandwidth.

The most prevalent Wi-Fi frequencies are 2.4 GHz (gigahertz) and 5 GHz. More people are turning to 5 GHz since the 2.4 GHz channels are older and generally more crowded.

Obstructions

Certain materials can also have a dramatic effect on wireless signal strength. Dense substances, like concrete, metal, or brick, tend to block Wi-Fi signals the most.

Wi-Fi (5 GHz) Signal Strength Loss Through Common Construction Materials

Here is a short list of some of the most potent blockers of Wi-Fi. The numbers below show how much the signal strength is reduced when passing through that material

Brick



1 Layer: -15 dBm
2 Layers: -32 dBm
3 Layers: -33 dBm

Masonry Blocks



1 Layer: -15 dBm
2 Layers: -27 dBm
3 Layers: -39 dBm

Concrete



4 inches: -23 dBm
8 inches: -52 dBm
12 inches: -78 dBm

Lumber



1.5 inches: -3 dBm
3 inches: -7 dBm
4.5 inches: -13 dBm
6 inches: -20 dBm

Estimates and pictures are from the NIST study of
Electromagnetic Signal Attenuation in Construction Materials

If you are interested in the exact science behind these numbers, check out the [study done by NIST](#), the National Institute of Standards and Technology.

In addition to the materials listed above, there are a few more common materials that reduce Wi-Fi signal strength. Metal obstructions have a massive impact on your signal, and can block it almost completely. Other materials, such as glass, sheet rock, and plywood can lower a signal's power significantly if they are multiple layers thick.

If you would like to know how strong your Wi-Fi signal is throughout your business, we offer a Wi-Fi signal strength mapping service. The process involves running a scan in the area around your wireless access points and producing a visual map that shows the regions of high and low signal strength. For more info, please contact us at sales@888-tech.com or call 504-888-8324.

Solutions to Common Wi-Fi Problems:

Your wireless access point does not produce the desired coverage

- Try moving your access point to a place that is around 6 feet above the floor. This will help the signal spread better.
- Keep all wireless reliant devices within line of sight of an access point.
- Are there electrical outlets available? If so, you can use powerline adapters to create a wired network connection between electrical outlets. This can be useful when trying to connect devices in an area that lacks a good Wi-Fi connection without the need for additional wiring. We often use the [NETGEAR PowerLINE 1000](#), which is a model that comes with a Wi-Fi access point.
- Consider upgrading your wireless router or access point to a model with better coverage. If you have questions about models of access points, contact us at sales@888-tech.com or call 504-888-8324.

Your wireless network goes in and out

- Upgrade the software/firmware on your wireless router.
- Replace your wireless router. Often times these devices will not function after more than a year or two.

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