Understanding RSSI

What is RSSI and what does it mean for a WiFi network?

RSSI, or "Received Signal Strength Indicator," is a measurement of how well your device can hear a signal from an access point or router. It's a value that is useful for determining if you have enough signal to get a good wireless connection.

Note: Because an RSSI value is pulled from the client device's WiFi card (hence "received" signal strength), it is not the same as transmit power from a router or AP.

The Basics: Why is my WiFi so slow and how do I fix it?

- Why Channels 1, 6, and 11? (/training/resources/why-channels-1-6-11.html)
- WiFi Signal Strength Basics (/training/resources/wifi-signal-strength-basics.html)
- Understanding RSSI (/training/resources/understanding-rssi.html)
- New Router with DSL (/training/resources/use-router-with-dsl.html)
- Change Router Settings (/training/resources/change-wireless-router-settings.html)

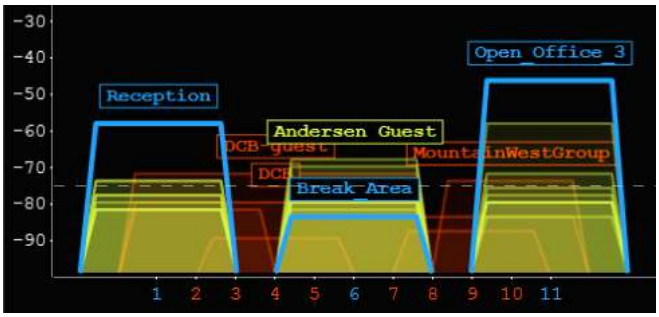
RSSI vs dBm

dBm and RSSI are different units of measurement that both represent the same thing: signal strength. The difference is that RSSI is a relative index, while dBm is an absolute number representing power levels in mW (milliwatts).

RSSI is a term used to measure the relative **quality** of a received signal to a client device, but has no absolute value. The IEEE 802.11 standard (a big book of documentation for manufacturing WiFi equipment) specifies that RSSI can be on a scale of 0 to up to 255 and that each chipset manufacturer can define their own "RSSI_Max" value. Cisco, for example, uses a 0-100 scale, while Atheros uses 0-60. It's all up to the manufacturer (which is why RSSI is a relative index), but you can infer that the higher the RSSI value is, the better the signal is.

Since RSSI varies greatly between chipset manufacturers, MetaGeek software uses a more standardized, absolute measure of signal strength: received signal power, which is measured in decibels, or **dBm** on a logarithmic scale. There's a lot of math we could get into, but basically, **the closer to 0 dBm, the better the signal is**.

To help leverage your signal strength measurement most effectively so you can make channel planning decisions, inSSIDer (//metageek.link/inssider-product-page) displays signal strength in two ways.



The Networks Table visualizes where selected networks are located on the 2.4 or 5 GHz band in relation to other networks, and the signal strengths of each.

The Signal Strength Over Time graph shows how your network's signal strengths changes as you move around the room or office.

Acceptable Signal Strengths

Signal Strength	TL;DR		Required for
-30 dBm	Amazing	Max achievable signal strength. The client can only be a few feet from the AP to achieve this. Not typical or desirable in the real world.	N/A
-67 dBm	Very Good	Minimum signal strength for applications that require very reliable, timely delivery of data packets.	VoIP/VoWiFi, streaming video
-70 dBm	Okay	Minimum signal strength for reliable packet delivery.	Email, web
-80 dBm	Not Good	Minimum signal strength for basic connectivity. Packet delivery may be unreliable.	N/A
-90 dBm	Unusable	Approaching or drowning in the noise floor. Any functionality is highly unlikely.	N/A

What if I have an acceptable signal strength but I'm still having problems?

If you've already checked your signal strength using a WiFi scanning app like inSSIDer (//metageek.link/inssider-product-page) and concluded that you have acceptable WiFi signal strength, then interference may be to blame. Your computer's WiFi adapter can help you see some types of interference, but for finding non-WiFi interferers, you'll need a spectrum analysis tool like Wi-Spy (/products/office/).

Next Lesson...

New Router with DSL (/training/resources/use-router-with-dsl.html)

The signal strength of the "MetaGeek" SSID is great (approx. -50dBm), but the actual wireless signal is being destroyed by a non-WiFi interferer, which is shown above with a large green spiky shape between channels 5 and 6.

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