

EION BYTES

The official solution update of EION Wireless



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Impact of Weather on Wireless Networks



A frequently asked question to all wireless service providers is:

Does weather affect fixed wireless networks?

The answer is **Yes & No**.

The answer is Yes if the network is not deployed correctly, and the answer is No if the network is properly engineered and link margins are properly calculated. If the right frequency and antenna system are properly engineered, designed, and installed, a wireless system can provide 99.999% reliability. This article focuses on the wireless networks deployed in bands from 5 to 6 GHz.



 **RAIN**

Moisture such as fog, rain, and snow (depending on its water content) adds attenuation to the signal's path. The amount of moisture is critical to understand here. Fog, although dense, has very low moisture when it comes to its effect on RF signals. With snow, it all depends on its density. Snow typically has less moisture content than actual rain. Rain depends on the amount of rainfall (measured in mm/h) and the size of the raindrops. Heavier raindrops combined with a higher velocity of rainfall result in higher attenuation. Typical rainfall produces roughly 5.5 dB. Again, it depends on the amount of rain coming down and the frequency being used.

 **SNOW**

Due to the larger size of snowflakes compared to raindrops, attenuation due to snow is generally higher than that of rain. However, the value is still low, compared to the link margin of Wireless systems 15 ~ 20 dB Fade Margin.



Live photo of EION radio on a snowbank.

 **HUMIDITY**

Humidity can affect the strength of your wireless signal, but not so drastically that you fail to receive a signal at all. Instead, the moisture in the air makes it more difficult for the signal to transmit efficiently, which could result in a slower, more sluggish connection speed.

 **WIND**

Radio signals are not usually affected by wind, but hardware such as external antennas or dishes can sway, vibrate, flex, or be moved by the wind.

 **FOG**

Depending on the frequency, the attenuation of signal levels will suffer slightly. For long-range links like 20 - 30 km, fog will cause only a very slight fade in the signal. It is not likely the fog; it is more like changes in the air pushing the signal off its intended path that affects the signal. This effect increases if your line of sight is close to earth/trees, i.e. the Fresnel zone does not exist.

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