



Cell Modem: Improving Weak Signal

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Gender-specific wording refers equally to the female and male form.

1. Introduction

In our experience we have not needed to use amplification for cell signals for Digi products, however conditions vary and eventually, when the signal is poor enough, help is needed. If the installation is in an area with an extremely poor signal, you may need a directional antenna. There are various styles of directional antennas available that usually improve the signal by about 10dB. A good signal will be in the range -50dBm (Excellent) to -99dBm (Marginal). This signal range is better than -100dBm. If the signal quality is worse than -100dBm (e.g. -107dBm) a directional antenna may provide a steady data connection.

In simplest terms, think of an omni-directional antenna as a standalone light bulb where the light goes in all directions, and think of a directional antenna as a flashlight where the light is reflected in a single direction.

2. Modem

The antenna connections on both the D-Link and Digi modems are an SMA female connection so it will need a cable from the antenna with an SMA male connector. Directional antennas will have various types of connectors that may have to transition to an SMA male connector to attach to the cell modem. Directional antennas will usually have to be mounted to a pole or post and aimed at the cell tower. On the D-Link modem, signal strength can be seen using the web interface available by connecting a laptop to the network port on the cell modem, opening up a browser and typing in the IP address at the top as specified in the cell modem manual. The main screen should display the available signal strength. Make gradual adjustments since the signal strength is not displayed instantaneously. The Digi modem has signal LEDs on the modem. More LEDs indicate a better signal.

Make sure the frequency range on a directional antenna corresponds to the frequency range of the cell tower and provider and that it is designed for MIMO (Multi-In, Multi-Out). Also, if individual antennas are being used, make sure the antennas have a 45 to 90 degree angle in reference to each other. The wire between the antenna and the cell modem needs to be of high quality and should be less than 5 meters.

3: Directional Antenna Example

Proxicast 4G/LTE Cross-Polarized MIMO High-Gain Panel Antenna Part# ANT-129-001

This model has two antennas inside that are oriented correctly so it just needs to be pointed to a cell tower.

