

## SpotCell<sup>®</sup> Optimal “Fringe Area” Installations

SpotCell adaptive repeaters operate in the 800 and 1900 MHz frequency bands and provide always-on wireless coverage to areas that otherwise have poor or non-existent coverage. Reduced coverage area is the result of a weak wireless signal and can be caused by natural and urban obstructions or distance between the wireless user and the nearest cell site.

This application note will recommend steps that can be taken to ensure an optimal installation in “fringe” areas where physical distance to the nearest base station is great or obstructions are high.

### RSSI and Isolation

Successful SpotCell installation and maximization of coverage area is dependent on two main factors.

SpotCell Donor Unit (DU) Received Signal Strength (RSSI) from the nearest base station has the most important impact on system performance. Factors that cause signal degradation (attenuation) from the base station to the SpotCell DU include: natural (foliage, hills, mountains) as well as urban obstructions (buildings, walls, underground locations).

A second factor, often more easily addressed, is the isolation between the SpotCell DU and Coverage Unit (CU). Isolation is a measure of signal attenuation between two locations. The greater the level of attenuation between the DU and CU, the more optimal level of gain will be applied to the system.

### Donor Unit Installation

The SpotCell DU is composed of an antennae and integrated electronics. When installing, the DU must be positioned to receive an adequate signal from the nearest base station. If a nominal signal of -106dBm is not

received by the DU, the SpotCell system will not function.

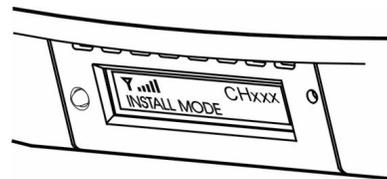
Given the various types of applications, there are many factors that affect DU RSSI.

Largely, the solution to obtaining sufficient RSSI in fringe area applications is to mount the DU in an outdoor location as high as possible.

A visual inspection of the surrounding landscape is a good starting point in determining possible locations for the DU. DU RSSI is best with a direct line of sight to the base station. If this is not possible or the direction to the base station is not known, choose multiple locations based on your ability to view the horizon in an unobstructed fashion.

A suggested DU installation location would be a rooftop mount using a tripod and masts, or similar structure that is high above the building roofline.

For each possible DU installation location, perform the install procedure and note the number of bars that represent DU RSSI values displayed on the CU. (see Figure 1). Once the highest RSSI value (max. 5 bars) is recorded, choose this as your optimum location for DU installation.



**Figure 1 - Install Mode RSSI Indicator**

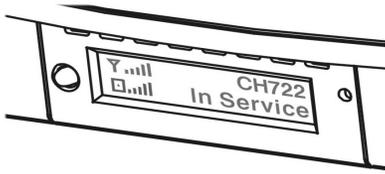
Reference the SpotCell Quick Install Guide and User Manual for complete installation details.

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## Coverage Unit Installation

The SpotCell CU is composed of antennae and integrated electronics. The CU is installed indoors to provide improved wireless coverage.

As system performance is also dependent on the level of isolation, the SpotCell DU and CU must be installed at a distance from each other that provides the highest level of isolation possible. While in “active” mode, the CU display will indicate system isolation (see Figure 2).



**Figure 2 - Active mode RSSI Indicator (upper left indicator) and System Isolation Indicator (bottom left indicator)**

The more bars displayed (max. 5 bars) indicate better isolation. A greater level of isolation means optimal gain for a greater coverage area.

To determine optimal location for CU placement, move the CU about the desired coverage location, monitoring the isolation indicator. Place the CU in the location that displays the highest number of bars.

Reference the SpotCell Quick Install Guide and User Manual for complete installation details.

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