

## Nextivity Oscillation Avoidance Technology

Per §20.21(e)(9)(ii) (A), Provider Specific Consumer Boosters must employ Anti-Oscillation strategies. There are two basic ways in which the requirement in this section can be fulfilled. In general, designs would include an oscillation detecting device that would detect when the booster starts to oscillate and would then reduce the gain of the booster in response to stop the oscillation. An alternative implementation, which is used by the Cel-Fi product, is to prevent the system from ever going into oscillation by monitoring the feedback signal levels and adjusting gain prior to the system entering an oscillation mode. We call this Oscillation Avoidance as opposed to Oscillation Detection.

Nextivity's oscillation avoidance technology is embedded in the custom signal processor chip that forms the heart of all Cel-Fi products. The signal processor in the Cel-Fi device measures the isolation between the donor and server antenna in real time while relaying the CMRS signal through the device. This measurement is performed using a real-time sliding correlator that compares the signal received at the donor input port to the signal that was transmitted at the server port. If the energy level of the signal received from the server port approaches the level where it will cause oscillation, the system gain is immediately reduced. By being able to measure the isolation in real time, the system is able to detect reductions in isolation prior to the isolation dropping below a point where the system can operate without going into oscillation. This means that the system can respond extremely fast to changes in the operating environment and hence never go into oscillation.

Furthermore, once a reduction in isolation is detected, the system will adjust its gain immediately and will not increase the gain until such point when the isolation is increased again. In other words, the system can by design never get into a loop where the isolation is decreased, the system starts to oscillate, the gain is reduced, the oscillation stops and then the gain starts to increase again.