LGC WIRELESS

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Subject: InterReach Unison Theory of Operation

The InterReach Unison system is an in-building wireless access system; comprised of a main hub, expansion hub, and remote unit.
In the InterReach Unison, the RF signals are down converted to an IF signal at the RF input. This IF signal is then sent through the system. At the RF output the signal is then up converted to the RF signal.
The following is a more detailed explanation of theory of operation.

Downlink
The downlink path of the Main Hub receives an RF signal from its connected base station or repeater via a coax cable. The Main Hub down-converts the RF signal to an IF frequency. The IF frequency is then used to AM modulate a laser diode. The optical output of the laser then passes to the Expansion Hub via an optical fiber.
The Expansion Hub receives the optical downlink signal from the Main Hub. A photo diode is used to convert the optical signal back into an electrical IF signal. The level of the IF signal is adjusted for the loss of the optical fiber. Then the IF signal is converted to 100-ohm impedance and sent to the RU by CAT-5 cable.
The RU receives the downlink IF signal from the Expansion Hub it converts the impedance back to 50 ohms and adjusts the level of the IF signal for the loss of the CAT-5 cable. The IF signal is then up converted back to the RF downlink signal and sent to the RF antenna.

Uplink
The uplink signal is received from the antenna and the RU then down converted to the uplink IF signal. The IF signal is converted to 100 ohm and is sent to the Expansion Hub by CAT-5 cable.
The uplink IF signal is received from the RU by CAT-5 cable in the Expansion hub; the signal level is adjusted for the loss of the CAT-5 cable. The signal is used to AM modulate a laser diode. The optical output of the laser is then passed to the Main Hub by an optical fiber.
The uplink path of the Main Hub receives an optical signal from the Expansion Hub via an optical fiber. The Main Hub converts the optical signal to an electrical IF signal, then up-converts the signal to an RF signal. The RF signal is then sent to the base station via a coax cable.