

Dentsply Professional – Theory of Operation

The Control unit transmits data to the remote unit through the RF link. The data is generated by the control unit and is encoded by the on board microprocessor. The data is sent to the transceiver and the RF carrier is modulated. The RF carrier is received by the remote receiver, where it is demodulated and decoded by the remote unit microprocessor. The received data is then displayed on the LCD display.

The RF communication is accomplished in the license-free 900 MHz ISM band (902 – 928 MHz). The data transmission and reception is performed via narrowband FSK modulation based on the Atmel AT86RF211 FSK transceiver. The transceiver is highly integrated, using an external +/-10 ppm crystal as a frequency reference, a receive RF filter to protect against jamming, and an IF filter to protect against adjacent channel interference. The receiver uses the classic 2 IF superheterodyne architecture.

An integral PCB antenna is included on both the control and remote units and is shared by the transmitter and receivers. The design will meet the FCC part 15.249 regulations. Once the remote unit recognizes the control unit, they are in constant communication through the RF channel.