DUTY CYCLE CALCULATION

The WHD-310(V)1 handset samples voice every 40ms which is then processed and sent to the module for over the air transmission. The sampling rate was specifically selected based on our codec, microcontroller processing power and maximum allowable packet size under the 802.15.4 protocol.

Attached please find a screenshot showing the processed voice being set to the RF module every 40ms. Each transmission shown in the screenshot is one frame which results in one packet sent out of the RF. You can see the delta of 40ms on the lower left hand side. As mentioned we send the maximum allowable packet size for 802.15.4.

The maximum possible packet size can be drawn directly from the 802.15.4 specification. The packet is made up the Synchronization header, which consists of the Preamble (4 bytes) and the SFD (1 byte), the Physical header length (1 byte), and the data payload (127 bytes). Therefore the maximum allowable packet size is 133 bytes.

The data rate specified for the 802.15.4 protocol in 2.4GHz range is 250 kbps. This results in an over the air time of [1 second / 250,000 bits] * [8 bits / 1 byte] * [133 bytes] = 0.004256 seconds, or 4.256 milliseconds.

So our duty cycle equals 4.256 / 40 = 10.64% or 11% depending on how exact you need to be.

Screenshot:

Advanced Compliance Laboratory, Inc. 6 Randolph Way, Hillsborough, NJ 08844, tel:(908) 927 9288