

Message Protocol, Timing, and Duty Cycle Calculation

The data output is phase encoded Manchester which has an inherent 50% duty cycle. The transmitted data rate is 3.7345 KBS +/- 0.5% i.e. each bit is typically 267 uS. in duration. Thus, $267 \text{ uS} \times 8 \text{ bits} = 2.14 \text{ mS}$ per byte and there are 2bytes of Preamble, 4bytes (L0-L3), 2Bytes of CRC, 1Byte for Message Type, 3Bytes for Tokens, and 2Bytes of Crc for a total of 14 bytes This equals $2.14 \text{ mS} \times 14 = 29.9999\text{mS}$, since Duty Cycle = Actual RF Transmission ON time / 100 mS.
 $29.9999\text{mS} / 2$ (inherent Manchester duty cycle) = 15% duty cycle Per 100 mS period.