

## General radio frequency exposure information.

The ZW4 is a low power transmitter operating in one of two modes, either as a frequency hopping spread spectrum transmitter or a low power device under 15.249 operating in the frequency band of 902 MHz to 928 MHz with 0.03 watts or less of output power. Per table 1 of 1.1307, paragraphs 1.1310 and 2.1091 of CFR 47, evaluation for this device is as follows. Due to the location of the antenna, normal operating conditions and use, the unit will satisfy the requirements for RF Exposure. Calculations are made here for completeness.

## Operating configuration and exposure conditions

The unit is placed on a scoreboard or table top positioned at least 20 cm from all operators. For master control operation, the unit is placed on a table top and used by a score keeper to update the remote score board. The score board unit is typically placed on top of a remote scoreboard, receives information from the master score controller and updates the scoreboard display.

## Calculated general population / uncontrolled exposure

Per 1.1310, the requirement for power density in general population/uncontrolled exposure is  $f/1500$ , which equates to  $0.6 \text{ mW/cm}^2$  calculated for 915 MHz. This calculated amount to be averaged over a time period of 30 minutes. The inherent design and use of this product places the antenna at a distance greater than the 20 cm used for this calculation. The 20 cm distance was used to show compliance only.

$$S = PG/(4\pi R^2)$$

Where  $S$  = power density in  $\text{mw/cm}^2$ ;  $P$  = input power to antenna in  $\text{mw}$ ;  $G$  = power gain of antenna; and  $R$  = distance from antenna in  $\text{cm}$ ;  $\pi = 3.14159$ .

For a minimum distance of 20 centimeters and 0.03 watts (30 mW) operation with the supplied antenna with a maximum gain of 1.64,  $S$  is calculated as  $0.0098 \text{ mw/cm}^2$ .  $S = 30(1.64)/(4\pi (20)^2) = 9.788\text{E-}3 \text{ mw/cm}^2$

This is well within the  $0.6 \text{ mW/cm}^2$  limit prescribed for general population/uncontrolled exposure as prescribed by CFR 47 paragraph 1.1310. Note: the unit meets the requirement for general population at a minimum distance of 2.75 cm.