Section 15.247(i) – Radio Frequency Hazard Information

As per Section 15.247 (b) (4) spread spectrum transmitters operating in the 2400 – 2483.5 MHz band are required to be operated in a manner that ensures that the public is not exposed to RF energy levels in accordance with CFR 47, Section 1.1307(b)(1).

The device when in operation is fixed and a safe distance could be maintained when events are undertaken.

In accordance with Section 1.1310 the Maximum Permissible Exposure (MPE) limits for the General Population / Uncontrolled Exposure of 1 mW/cm2 has been applied.

The maximum distance from the antenna at which the MPE is met or exceeded is calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain and separation distance in metres:

E, V/m = (√ (30 * P * G)) / d
Power density, mW/cm2 = E2/3770
E for MPE: 1 = E2/3770
E = √1*3770
E = 61.4 V/m

The highest conducted power of the Wi-Hart module transmitter has been measured to be +7.57 dBm or 0.0057 watts.

Attached to this transmitter will be a variety of antennas, as prescribed in the user manual, however the antenna with the highest gain will be the Y2400-EL 18 dBi Yagi antenna with 3 metres of CC3-SMA coax cable that has a loss of 4 dB. This gives an overall gain of 25.1 or 14 dBi.

Therefore when the Wi-Hart transmitter is operating on its own the following will apply:
E = √ (30 * P * G) / d
d = √ (30 * P * G) / E
d = √ (30 * 0.0057 * 25.1) / 61.4
d = 0.033 m or 3.3 cm

The highest conducted power of the Wi-Fi module transmitter according the FCC equipment authorisation draft is 0.706 watts for the 2.4 GHz device and 0.372 watts for the 5 GHz device.

Attached to this transmitter will be a variety of antennas, as prescribed in the user manual, however the antenna with the highest gain will be the Y2400-EL Yagi antenna with an overall gain of 4.0 or 6 dBi.

Therefore when the Wi-Fi transmitter is operating on its own the following will apply:
E = $\sqrt{}$ (30 * P * G) / d
d = $\sqrt{}$ (30 * P * G) / E
d = $\sqrt{}$ (30 * 0.706 * 4.0) / 61.4
d = 0.15 m or 15 cm

When operating simultaneously a worst case effect would be when both radiated powers added together.

Therefore the worst case calculation would be

E = $\sqrt{}$ (30 * P * G) / d
d = $\sqrt{}$ (30 * ((P1 * G) + (P2 * G)) / E
d = $\sqrt{}$ (30 * ((0.706 * 4.0) +(0.0057 * 25.1))) / 61.4
d = 0.153 m or 15.3 cm

Result: Complies if a minimum safe distance of 20 cm is specified in the set up instructions for this system.