# Exposure limit according to §15.247(i) and RSS-102

The control panel is classified as mobile device.
The calculation with additional transmitter FCC ID:RI7HE910NA for end-use multi-radio is provided below.
Recommended MPE distance is 20 cm when all antennas are within 20 cm of each other. The simultaneous transmission of 2 above mentioned transmitters is evaluated.

Power density1 / Limit1 + Power density2 / Limit2 must be < 1.

Limit for power density for general population/uncontrolled exposure is $f/1500 = 0.56$ mW/cm$^2$ for 824-849 MHz,
1 mW/cm$^2$ for 2425 MHz frequency.

The power density $\mathbf{P\ (mW/cm^2)\ =\ P_T\ /\ 4\pi\ r^2}$

1) $P_T$ is the transmitted power, which is equal to the peak transmitter output power 19.07 dBm plus maximum antenna gain 0 dBi, the maximum equivalent isotropically radiated power EIRP is

$$P_{T1} = 19.07 \text{ dBm} = 80.7 \text{ mW}.$$

The power density at 20 cm (minimum safe distance, required for mobile devices), calculated as follows:

$$80.7 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.016 \text{ mW/cm}^2$$

2) Maximum conducted output power given in FCC ID:RI7HE910NA module grant is 1648 mW (32.17 dBm) in 824.2-848.8 band. The gain of antenna used with the module in the control panel is – 5 dBi.
The maximum equivalent isotropically radiated power EIRP is
$$P_{T2} = 32.17 \text{ dBm} – 5 \text{ dBi} = 27.17 \text{ dBm} = 521.2 \text{ mW}$$
The power density at 20 cm is calculated as follows:

$$521.2 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.1 \text{ mW/cm}^2$$

Total Power density1 / Limit1 + Power density2 / Limit2 =
0.016/ 1 + 0.1/0.56 = 0.016 + 0.18  = 0.196 < 1.

General public cannot be exposed to dangerous RF level.