5.12. RF EXPOSURE REQUIREMENTS @ 1.1310 & 2.1091

5.12.1. Limits

- **FCC 1.1310:**- The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
(A) Limits for Occupational/Control Exposures				
300-1500	...	...	F/300	6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	...	...	F/1500	6

F = Frequency in MHz

5.12.2. Method of Measurements

Refer to FCC @ 1.1310 and 2.1091

- In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

(1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
(2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
(3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
(4) Any other RF exposure related issues that may affect MPE compliance

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi \cdot r^2} = \frac{EIRP}{4\pi \cdot r^2}$$

Where: P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm^2
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device

$$r = \sqrt{\frac{PG}{4\pi \cdot S}} = \sqrt{\frac{EIRP}{4\pi \cdot S}}$$

FCC radio frequency exposure limits may not be exceeded at distances closer than r cm from the antenna of this device

5.12.3. Evaluation of RF Exposure Compliance Requirements

Lowest Frequency, **F[MHz]** = 806

MPE Limit for Occupational/Controlled Exposure, **$S_{controlled}$[mW/cm^2]** = F / 300 = 806 / 300 = 2.69

MPE Limit for General Population/Uncontrolled Exposure, **$S_{uncontrolled}$[mW/cm^2]** = F / 1500 = 806 / 1500 = 0.537

Maximum RF Power conducted, **$P_{conducted}$[dBm]** = 34.81

Maximum Antenna Gain, **G[dBd]** = 0

Maximum EIRP, **P_{EIRP}[dBm]** = 34.81 + 2.15 = 36.96

Calculated RF Safety Distance for Occupational/Controlled Exposure, **$r_{safety\_controlled}$[cm]** = 12.2

Calculated RF Safety Distance for General Population/Uncontrolled Exposure, **$r_{safety\_uncontrolled}$[cm]** = 27.2

Specified Safety Separation Distance in User's Manual = **28 cm**

Antenna Gain (dBd)	Maximum EIRP (dBm)	Calculated RF Safety Distances (cm)	Specified Separation distance (cm)	Compliance
0	36.96	12.2 & 27.2	**28**	Complies