

RF Exposure Compliance Requirements TSLM UHF Wireless Modem

FCC Rule: 1.1307, 1.1310, 2.1091 (b) (d), 2.1093

Description of Compliance:

The TSLM will be professionally installed in the SCADA (Supervisory Control And Data Acquisition) market and will be mounted with a fixed RTU (Remote Terminal Unit). A typical installation would use a maximum gain antenna of 10 dBi mounted on a tower. A minimum separation distance of more than 121 cm must be maintained between the radiating structure and any person to classify as a mobile under FCC MPE regulations.

Note: It is the responsibility of the user to guarantee compliance with the FCC MPE regulations when operating this device in a way other than described above.

The calculation for the more stringent specification, a General Population/Uncontrolled Mobile device according to section 2.1091(b) and section 1.1310 Note 2 is shown below:

Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (mins)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	---	---	f (MHz)/1500 (MHz)	30
1500-100000	---	---	1.0	30

Environmental Specification: $f(\text{MHz})/(1500 \text{ mW/cm}^2)$
 $406 \text{ MHz}/(1500 \text{ MHz mW/cm}^2) = 0.27 \text{ mW/cm}^2$ (worst case)

$$S = (PG)/(4\pi R^2) \quad (\text{OET Bulletin 65})$$

Where:

S = Power Density (mW/cm²)

P = Power input to the antenna (mW)

G = Power Gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna (cm)

Distance Calculation:

$$R = \sqrt{(PG)/(4\pi S)}$$

Typical Antenna Gain: 10.0 dBi $10^{(10.0 \text{ dBi}/10)} = 10.0$

Power input to the Antenna: 37dBm = $10^{(37\text{dBm}/10)} = 5000 \text{ mW}$

$$R = \sqrt{(5000\text{mW} * 10.0)/(4\pi * 0.27 \text{ mW/cm}^2)} = 121 \text{ cm (Minimum Distance)}$$