

Maximum permissible emissions (MPE)

As outlined in the "TMAN installation and operation manual" the user is typically located 2-3 meter in front of the TrackMan™ Radar Unit.

The TrackMan™ Radar Unit can easily be re-located, so it is classified as a mobile device.

The transmitting power P_{tx} is nominal 10 mW. The transmitting antenna gain G_{tx} is at maximum direction 17 dB (equal to 50 times). The maximum equivalent isotropic radiated power EIRP of the TMAN consequently:

$$EIRP_{max} = P_{tx} * G_{tx} = 500 \text{ mW (nominal)}$$

For comparison the maximum field strength E measured in Appendix 7 of this application was 120 dBuV/m this equals 1 V/m at 3 meters distance. The corresponding EIRP can be calculated like this:

$$EIRP = (3 \text{ m})^2 * E^2 / 30 \text{ ohm} = 300 \text{ mW (measured)}$$

From the EIRP the power density p can be calculated using the equation below:

$$p = EIRP / (4 * \pi * D^2) \quad [1]$$

, where D is the distance from the transmitting antenna.

Equation [1] assumes that the distance D is big enough to be in the far field of the antenna. In the near field of the antenna, the power density p will be less than what is obtained from equation [1]. The far field distance (Rayleigh distance) of the antenna is around 0.45 m ($2 * D_{ant}^2 / \lambda$).

Using equation [1] with the nominal EIRP of 500 mW at distance of 20 cm, the maximum power density is 0.1 mW/cm².

At the normal operating distance of 2 meter, the maximum power density is 0.001 mW/cm².

The MPE of the TMAN is consequently far under the limit specified in FCC OET bulletin 65 of 5 mW/cm² and 1 mW/cm² for both controlled and uncontrolled exposure respectively.