

RF Exposure Info / MPE Sample Calculation

Model: ION-M7P/7P/19P/19HP
FCC-ID: XS5-M77P19P19HP

The ION-M7P/7P/19P/19HP is a fiber optic based RF repeater for wireless applications. An RF signal is converted to an optical signal by directly modulating a laser. There is no frequency conversion in this system. The optical signal is converted back to RF at the ION-M remote unit, amplified and broadcast from an antenna or into a passive RF distribution system, such as radiating cable.

The RF gain in the system is maintained at a constant level throughout the system via AGC and the user does not need to adjust the gain of the system. The user would inject an RF signal to produce the appropriate RF output power from the ION-M remote unit. The receive path will always terminate in an RF source, such as a base station or repeater, and will not be directly connected to any antenna.

The specific device generally will be professionally installed.

Hereby the gain of the finally installed antenna(s), cable attenuation and antenna height will be defined site specific at the time of licensing with the appropriate FCC Bureau(s).

The maximum permissible exposure limit is defined in **47 CFR 1.1310 (B)**.

Limits for General Population / Uncontrolled Exposures

Frequency Range (MHz)	Power Density (mW/cm ²)
300 – 1500	f/1500

The EUT operates in the 2 frequency bands: 700 and 1900 MHz.

The lowest limit for Power Density is at the lowest frequency in the 700 MHz band. At 728 MHz the Power Density Limit is **2.423mW/cm²**.

The max measured conducted output power is 43.0 dBm (20 W) at the 700 MHz path.

The maximum permitted level is to be calculated using general equation:

$$S = P \cdot G / 4\pi R^2$$

P = 20W; G = antenna-cable attenuation to be defined (numeric gain); $\pi = 3,1416$

The min separation distance between the antenna and any human body is to be calculated (solving for R in cm) with the final actual antenna gain/cable attenuation where the limit of 2.423 mW/cm² is kept.

Example:

For a antenna gain = **12 dBi** the distance is **R=2,82 m**.

Or for f=1930MHz (5 mW/cm² and P=46 dBm) and a gain = **12 dBi** the distance is **R = 2.241m**.

The antenna(s) used with device must be fixed-mounted on permanent structures with a distance to any human body to comply with the RF Exposure limit.