

Exposure Compliance

FCC ID: PEJ-938224-XETA24M-T

IC ID: 11169A-XETA24M-T

It is the responsibility of the licensee or user to guarantee compliance with the appropriate MPE regulations when operating this device in a way other than described herein. The installer of this equipment must ensure the antenna is located or oriented such that it does not emit an RF field in excess guidelines as posted in the Canadian RSS-102/Safety Code 6 of Health Canada, 47 CFR Bulletin 65/47CFR § 1.1310 of the Federal Communications Commission, or the Council of European Union as appropriate.

The XetaWave XETA24 uses a low power radio frequency transmitter. The concentrated energy from an antenna may also pose a health hazard in the near field. People should not be near the antenna when the radio link is operating as general practice and maintain a safe distance as calculated below.

Note: Industry Canada and the FCC use the same RF power density level for their limits, but express them in different units. The US/FCC/OSHA/ANSI use milliwatts per square centimeter (mW/cm²) and Industry Canada uses Watts per square meter (W/m²).

$$\text{Equation 1: } W / m^2 = 10(mW / cm^2)$$

The following calculations are based off the Maximum Permissible Exposure requirements as outlined by the FCC and IC.

The MPED (Maximum Permissible Exposure Distance) is calculated based on the limits for a General Population/Uncontrolled Exposure in the 1,500 – 100,000 MHz frequency band using the stated MPE power density limit of 1.0 mW/cm² or 10 W/m². The following table provides safe distance for several power levels and antennas besides the worst case for convenience.

To calculate safe distance:

$$\text{Equation 2: } MPED = \sqrt{\frac{(ConductedPower(mW))(DutyCycle)(AntennaGain)}{(4\pi)(ExposureLimit(mW / cm^2))}}$$

Where:

MPED is Maximum Permissible Exposure Distance or safe distance.

All quantities are calculated in linear or numeric quantities.

The exposure limit, MPED, and conducted power units must be consistent, mW and cm for this case.

Duty cycle is set using packet sizes for master and slave. The highest duty cycle, 93%, that can be set is 1600 transmit and 64 receive using a modulation of 57 kbps MSK. Packet settings are set in the radio Network Configuration Menu. If the radio is a master then master packet size is set to 1600 and slave packet size is set to 64. All radios in the link must have the same master and slave settings. At Power up and with no data transmitting, the radios will transmit or beacon with a duty cycle of 6 to 10% depending upon modulation setting.

The limits for Industry Canada are in Watts per square meter and easily calculated from equations 2 and then 1 above.

Table of MPE Safe Distance vs. Antenna Gain and Power Output Setting						
Power Out Setting (mW)*	Duty Cycle (linear)	Antenna Gain (dBi)	Antenna Gain (linear)	FCC MPE Limit (mW/cm²)	IC MPE Limit (W/m²)	Safe Distance (cm)
1000	0.93	20	100	1.0	10	86.03
1000	0.93	15	31.62	1.0	10	48.37
1000	0.93	12	15.85	1.0	10	34.25
1000	0.93	3	2.00	1.0	10	12.17
100	0.93	20	100	1.0	10	27.20
100	0.93	15	31.62	1.0	10	15.3
100	0.93	12	15.85	1.0	10	10.83
100	0.93	3	2.00	1.0	10	3.85
10	0.93	20	100	1.0	10	8.60
10	0.93	15	31.62	1.0	10	4.83
10	0.93	12	15.85	1.0	10	3.42
10	0.93	3	2.00	1.0	10	1.22

*The worst case is 1000 mW with an antenna with 20 dBi gain or greater or 86.03 cm as power output is reduced as required by the appropriate regulating authority.