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FCC Limited Modular Application Request

FCC ID: HCQ3B6OTPMTX
March 2, 2011

In compliance with FCC Public Notice DA 00-1407, this document is submitted to request a limited modular approval and address the eight requirements identified in the Public Notice:

1.) The RF portion of the circuit has limited shielding from the integrated ground plane in the device's printed circuit board, and the requirement for shielding is not fully compliant for a Full Modular Grant. Control of the final installation will be performed progressively through instructions documented in the installation manual, review of the host installation by Inovonics, and if necessary, testing the host installation to verify compliance.
2.) This transmitter only accepts a switch closure for data input. The rate at which the input switches affect modulation is controlled by a micro-controller; excessive data rates are not possible.
3.) The modular transmitter has its own voltage regulator, VR1 on the schematic.
4.) The antenna on the modular transmitter is a printed trace on the PCB; it is permanently attached.
5.) The module was tested in a stand-alone configuration. Power was supplied by a 3.2 volt battery.
6.) The modular transmitter will be labeled with its own FCC ID number (see submitted picture), and the modular transmitters will include the following instructions for exterior label requirements:

"FCC Label Requirements for EN1501-EXT
Inovonics Wireless has received Federal Communications Commission (FCC) approval to market RF modules. The host integrator is responsible for properly labeling the product containing the RF module. Labels must be placed on the outside of the product, and must include a statement indicating that product contains the module, along with the FCC number.

Example 1 "Contains RF Module FCC ID: HCQ3B6OTPMTX"
Example 2 "Contains FCC ID: HCQ3B6OTPMTX"

RF Module FCC Registration Number
EN1501-EXT
• FCC: HCQ3B6OTPMTX"

7.) The modular transmitter was tested and conforms with Section15.247.

8.) **RF Exposure Information:**

The device is compliant with MPE requirements (47CFR2.1091) and SAR requirements (47CFR2.1093).

Calculation for compliance with MPE requirements (47CFR2.1091) is done using a worst-case transmitter power of 50 mW, assuming a unity gain antenna, and an exposure limit of 0.6 mW/cm^2 (f/1500 mW/cm^2 at 20 cm per 47CFR1.1310) for general applications. This device is not carried or worn by the user. It has an extremely low duty cycle and a low rate of transmission that dramatically reduces the average power level that could pose an exposure hazard.

The transmitter initiates a transmission upon sensing a change of state. In addition to these change-of-state transmissions, the transmitter is configured to transmit a supervisory message once every 3 minutes. The maximum message length may occur when the transmitter transmits a serial message consisting of a 12 ms preamble followed by 32 ms of synchronization, identification, payload, and CRC data. The averaging interval specified in Table 1(B) of 47CFR1.1310 is 30 minutes. For the purposes of this calculation, it is assumed that ten supervisory and five change-of-state messages will be sent in the 30-minute interval. Each supervisory message consists of 3 redundant packets, and each change of state message contains 21 packets, for a total of 135 packets in the 30-minute interval. A packet is typically 22.4 ms in length. For this calculation, a maximum packet length of 44 ms will be used.

The worst-case average power density at a distance of 20 cm is then,

$$50mW \times \frac{135\,packets}{30\,\min} \times \frac{44ms}{packet} \times \frac{1\,\min}{60 \times 10^3 ms} \times \frac{1}{4\pi(20cm)^2} = 32.8\frac{nW}{cm^2}$$

This is well below the 0.6 mW/cm^2 MPE limit.

Calculation for compliance with SAR requirements (47CFR2.1093) is done using a worst-case transmitter power of 50 mW time-averaged by the duty cycle of the transmitter, and the assumption that all RF energy could be absorbed in 1 gram of tissue. The peak exposure limit is 1.6 mW/g (equivalent to 1.6 W/kg per 47CFR2.1093) in any 1 gram of tissue for General Population/Uncontrolled applications.

In any 3-minute interval, worst-case the device may transmit up to 2 alarm messages and a supervisory message for a total of 45 packets.

The maximum duty cycle of the device is,

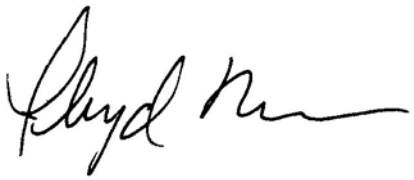
$$\frac{45\,packets}{3\,\min} \times \frac{44ms}{packet} \times \frac{1\,\min}{60 \times 10^3\,ms} = 0.011 = 1.1\%$$

The time-averaged RF transmitted power is then,

$$0.05W \times 0.011 = 0.55mW$$

If all of the transmitted power were absorbed in a 1-gram sample of tissue, the resulting power density is 0.55 mW/gram and is well below the 1.6 mW/gram limit.

Sincerely,



Director of Manufacturing Engineering