GE Interlogix, Inc.
Node Repeater
B4Z-855-NODE
Certification

Report Addendum
RF Exposure Compliance Statement

GE Interlogix, Inc

Node Repeater
B4Z-855-NODE

9/11/2003

GE Interlogix, Inc.
2266 North Second Street
North Saint Paul, MN 55109
(651) 777-2690

1. RF Exposure Compliance Statement

The following discussion will establish compliance of this transmitter with FCC MPE regulations. It may be viewed as an addendum to §3.6.3 of the original report.

1.1 Peak Radiated Power for Purposes of RF Exposure Compliance

Exhibit U of the original report shows that the peak output power of the transmitter is 23.6dBm. §3.3.3 of the original report shows that the gain of the DUT antenna is 1.95dBi. The transmitter peak radiated power is therefore obtained as follows:

Peak Radiated Power = 23.6dBm + 1.95dB = 25.55dBm

As allowed in §2.1091(d)(2), source-based time averaging may be used to reduce the declared RF exposure level. This transmitter has inherent duty cycle properties that may not be modified by the user and therefore fall under the source-based time averaging provision. The following is the derivation of the allowed correction factor for this transmitter.

The transmitter employs amplitude modulation and transmits 208 bits. Each bit has an "ON" time of 122 μS. The total on time of a single packet is:

208 * 122 μS = 25.376 msec.

The interpacket delay time of 45mS, enforced by the software, ensures that only one packet is sent in any given 100mS window. The duty cycle correction factor is therefore:

20*LOG(25.376/100) = -11.91 dB

Using the above peak radiated power and duty cycle correction factor, the peak power of this transmitter for determination of RF exposure levels is:

P = 25.55dBm – 11.91dB = 13.64dBm = 23.12mW

1.2 FCC RF Exposure Limit

For the purposes of demonstrating RF exposure compliance, the limits for general population/uncontrolled exposure in §1.1310 will be used. Table 1B of this section gives the allowed power density as:

Power Density Limit = f/1500 = 915/1500 = 0.61mW/cm^2

1.3 Calculation of Distance from Transmitter to Reach FCC Exposure Limit

The distance from the transmitter at which the allowed power density limit is reached may be calculated using the general relation:

$$\text{Power Density} = (\text{Power Transmitted})/4\pi r^2$$

Solving for r, the distance from the transmitter, we have

$$r = \text{sqrt}(P_t/4\pi P_d)$$

Substituting the allowed FCC Exposure limit for P_d and the transmitter peak power for P_t, we have:

$$r = \text{sqrt}(23.12\text{mW}/4\pi(.61\text{mW/cm}^2)) = 1.74 \text{ cm}$$

1.4 Discussion and Conclusion

This result shows that a person must be within 1.74 cm of this transmitter in order to be exposed to the FCC RF exposure limit as given in §1.1310. Note also that this analysis assumes that the transmitter would be sending data packets continuously, which is not a realistic mode of operation. In an actual installation with 128 sensors installed, the on-time of the transmitter would be reduced from this number by a factor of 100 or more.

This device is intended to be permanently mounted in a fixed location. The preceding analysis shows that a person must essentially be touching the device in order to be exposed to the FCC RF exposure limit. Because of the unlikelihood of this situation and its incongruence with the intended use of the product, warning or caution labels regarding RF exposure are not necessary and will not be affixed to the device.