FCC Part - 15.247(a) Pseudo Frequency Hopping Sequence

The Xemics transceiver IC, XE1202 used on both the Personell Alert Base and Badge models complies with Section 15.247(a).

The base transmits and listens for 4 timeslots on a maximal length sequence of 50 frequencies generated by the dipswitch selected, linear feedback shift register (lfsr). The switch selects one of six lfsr and is adjustable without having to reset the base. After 50 transmit/listen events the seed for the lfsr is incremented so that the next pass through the maximal length sequence will produce a new ordering of results. The lfsr calculates one of six polynomials dependant on the dipswitch setting shown below:

d2, d1, d0	
001	x6 + x5 + 1
010	inverse x6 + x5 + 1
011	x6 + x5 + x4 + x + 1
100	inverse x6 + x5 + x4 + x + 1
101	x6 + x5 + x3 + x2 + 1
110	inverse x6 + x5 + x3 + x2 + 1

The lfsr result is a pointer in the frequency table of 50 frequencies with a spacing of 500 kHz and a range from 902.5 MHz to 927.0 MHz. The FSK frequency deviation is 100 kHz and the base band bandwidth is 200 kHz.

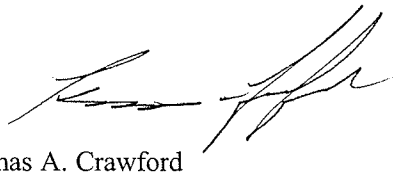
The base transmits the 4 bytes and then becomes a receiver for four timeslots of 4 ms each. Badges on the current frequency respond randomly in one of the four timeslots. The badge transmits 2 data bytes and a 2-byte crc-ccitt. The badge data contains the acknowledge bit in bit 6 of the second data byte sent. Bit 7 is the msb of the 9-bit serial number. The remaining bits of second data byte contain the current badge frequency for verification at the base. The first data byte contains the low 8 bits of the 9 bit serial number. The base records the serial number and acknowledged state of any badge responding in the four timeslots.

At the end of 50 transmit/listen events, the base reports to the host using the uP USART in synchronous mode. The first two bytes of reported data is the high and low byte of the number of badges counted in the last two passes of 50 frequencies. Two passes are included as badges sleep for an extra pass. The next byte is the dipswitch selected lfsr 1 through 6. The fourth byte contains the lo, hi, system fail status of the relay contact inputs on the board logically or'd with the force inputs from the host uP. The host uP receives force data from the modbus uP and controls the force inputs to the base. Bytes 5 to 805 are 400 high and low byte serial numbers collected in the last two passes. The data to host transfer takes approximately (805 bytes x 8 bits/byte) / 500 kbaud = 13 ms.

which states "a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section."

Section 15.247 (a)(1)(i) states "For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz."

The Personnel Alert base station utilizes a frequency table of 50 frequencies with a spacing of 500 kHz and a range from 902.5 MHz to 927 MHz. The FSK deviation is 100 kHz and the base band bandwidth is 200 kHz.



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