



MINI MITTER

20300 Empire Avenue, Building B-3 • Bend, OR 97701 USA • Fax (541) 322-7277 • Phone (541) 322-7272
email: mm@minimitter.com • web page: <http://www.minimitter.com>

January 13, 2005

Attention FCC Application Reviewer:

Mini Mitter has added a new Heart-Rate/Respiration Rate Sensor to its VitalSense Integrated Physiological Monitoring System. The VitalSense system consists of telemetric sensors and a monitor which receives and displays data from the sensors. The VitalSense system is presently authorized under FCC ID #JIAXTP1.

The present authorization covers two temperature sensors and a receiving monitor unit. The two temperature sensors have transmitters with substantially equivalent circuitry. The main difference between the two temperature sensors is that the capsule sensor uses an air coil antenna, and the dermal patch sensor uses a printed circuit board loop antenna. The bias topology in the capsule sensor has fewer components than the dermal patch sensor.

The main difference between the old sensors and the new "XHR" sensor is that the presently authorized sensors measure temperature and the new sensor measures heart rate and respiration rate. The temperature sensors use a multivibrator and a counter as their analog-to-digital converter (ADC). The microcontroller in the temperature sensors is a Xemics XE88LC06 which has a clock oscillator running at 32.768kHz and an internal RC clock running at approximately 1 MHz. The new XHR sensor uses a Microchip PIC16F88 microcontroller with an internal ADC. The PIC16F88 has a clock oscillator running at 32.768kHz and an internal RC oscillator operating at approximately 4 MHz.

The new XHR sensor uses the same carrier frequency, data rate, modulation rate and index, and pseudo-random time-domain multiplexing scheme used in the temperature sensors. The topology and components of the transmitter portion of the XHR are identical to the capsule temperature sensor. The antenna of the XHR sensor is identical to the dermal patch temperature sensor. The bias of the capsule sensor was used on the XHR rather than the bias used on the dermal patch sensor to reduce harmonic levels re-radiated by the ECG leads.

Further explanation of the system can be found in "FCC Theory of Operation.pdf".

With best regards,

Donna Barton
RF Design Engineer
Mini Mitter Co., Inc.