

EXHIBIT R – Operational Description

FCC ID CM676A90343-WMTS

Operational Description

The Model 90343 is a multi-parameter biomedical telemetry transmitter that is used for the transmission of a patient's vital signs data, including the electrocardiogram (ECG), blood oxygen saturation (SpO₂), and non-invasive blood pressure (NIBP). This physiological data is encoded in a digital format and used to FSK-modulate a crystal controlled, RF carrier. This device is intended for use within the confines of medical facilities. It is not intended for off-premise vehicular use.

The Model 90347 transmitter is a lesser version of the 90343. It utilizes the same RF and ECG circuit boards, but lacks the SpO₂ circuit board and the NIBP interface, making it a singular parameter (ECG only) device.

The model 90343 consists of three major printed circuit board assemblies (PCBAs). The ECG PCBA (part number 670-0285-02) acquires the patient's ECG via skin electrodes that are interconnected to this PCBA through 5 lead wires. The ECG analog signal is conditioned and band-limited, and then routed to the RF PCBA (part numbers 670-0969-00 through 670-0972-00).

The Model 90343 also includes a PCBA for acquiring and computing the patient's blood oxygen saturation value (SpO₂). This SpO₂ PCBA (part number 670-0916-00) interfaces with selected standard pulse oximetry sensors which emit red and infrared (Ir) light through a patient tissue bed that includes arterial blood flow. These light sources are detected by photodiodes embedded in the same sensor. The ratio of the amount of absorbed red light to the amount of absorbed Ir light is used to compute the patient's blood oxygen saturation value and arterial pulse value. This PCBA is also used to communicate with a separate SMI patient monitoring product, the Model 90217 Ambulatory Blood Pressure (ABP) Monitor. The Model 90217 ABP monitor can be programmed to episodically or on demand, measure the patient's blood pressure non-invasively. This non-invasive blood pressure (NIBP) value is stored in the Model 90217. This NIBP value can also be transferred to the Model 90343 via a communications port on each product. The Model 90347 is identical to the Model 90343, except it does not include the SpO₂ PCBA. All other PCBAs are the same between both products.

The diagnostics software executes on the CPU (Motorola 68CK16Z4) of the Transmitter's SpO₂ printed circuit board assembly (PCBA) at a clock rate of 4.194 MHz via the internal Phase Locked Loop (PLL) on the CPU. The clock to the CPU is a standard watch crystal (32.768 kHz). A pulse width modulator (PWM) is used to drive the SpO₂ red and infrared diodes at 2.048 Hz rate. The CPU buses used for drive, gain, baseband signal output (numerical SpO₂ and NIBP data), and SpO₂ sampling operate at 2.097 MHz. These buses control the digital-to-analog converters (DACs) for drive current, gain, baseband signal output to the RF modulator. With simulated ECG waveform data inputted into the ECG PCBA, all functions are activated in the diagnostics software and represent a worst case data scenario. Under normal operation, the analog-to-digital converter (A/D) and drive circuitry will power down momentarily to conserve power-this does not occur in the test software.