Pentair Pool Products

Operational Description of RF2000 Transmitter and RF 2000 Receiver

RF2000 Transmitter:

The RF2000 transmitter is a 433 MHz, single frequency, on-off keyed (OOK) type transmitter. Its architecture and design are based on a negative feedback colpitts type oscillator which is frequency stabilized by a surface acoustic wave (SAW) resonator. The unit is powered by one 9 volt battery and consumes close to 5 mA of current. The system modulation is accomplished by the turning on and off of the transmitter with a microprocessor running at 4 MHz. The data rate of the modulation is just under 600 baud and is always constant. There are pushbuttons on the transmitter which when depressed activate one bit in the data packet which give the transmitter a very low duty cycle. The transmitter is on only when a button is depressed and immediately ceases transmitting on the release of the same button. Each push button causes one of several relays to be activated in one of its associated receivers. The antenna type employed is an inverted-F planar type which is permenantly mounted to the transmitter's PCB. There is a piezo element that beeps once after every transmitted packet sent. The unit will also turn itself off within 5 seconds if any of the pushbuttons become accidentally depressed

RF2000 Receiver:

The RF2000 receiver is based on Micrel Corp.'s MICRF002 radio receiver IC. It is a very highly integrated superhetrodyne receiver. It is solely a single frequency AM receiver. It is powered by a simple non-magnetic rectifier, filter and regulator circuit which converts 120 VAC to 5 VDC. It consumes ca. 10 mA of current. It uses a fixed local oscillator (LO) which is entirely integrated into the IC. The LO reference is obtained from the 7 MHz crystal attached to the IC which is the only external oscillator connected to the receiver IC. The receiver design employs one low-noise amplifier (LNA) for additional gain and one front-end SAW filter for improved selectivity. The antenna used is a permanently mounted 30 ga. copper wire cut to ca. ¼ wavelength of the receiver frequency. The on-board microprocessor (MCU) is always on and processing the incoming data from the receiver. When the MCU encounters a valid preemption from its associated transmitter, it changes the state of one of its two relays. The entire receiver unit is UL approved.