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EZMultiPli Operational Description

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EZMultiPli is a wireless RF multi-sensor which can sense motion using a PIR circuit, temperature and light level. EZMultiPli uses the Z-Wave RF radio protocol using 916Mhz and 908Mhz. The device is mains powered and enclosed in a plastic enclosure which is sealed and cannot be opened by the user. When motion is detected with the Pyroelectric InfraRed (PIR) sensor, a short RF transmission is made at 9.6K, 40K or 100K bits per second depending on the mode supported. The RF transmission is sent at most once every 60 seconds. The Temperature and light level sensors regularly send their readings with a short RF transmission at a default rate of once per hour. Thus, the duty cycle of the RF transmission is typically quite low with typically 2 transmissions once per hour.

A Sigma Designs ZM5202 RF transceiver chip is used to sample the sensors and send the RF transmissions. This integrated transceiver includes a microprocessor which operates on a crystal oscillator frequency of 32MHz. The RF pin of the transceiver passes thru two capacitors used for impedance matching to the PCB antenna. The transceiver chip manages the output power.

The RF transceiver operates in half-duplex fashion to provide two-way communications with other devices. The transceiver operates in the 900MHz ISM band at either 916MHz or 908MHz. The digital data is Manchester encoded and sent using FSK modulation at a 9.6Kbit/sec, 40Kbit/sec or 100Kbits/sec. The deviation of the modulation is plus and minus 15KHz.