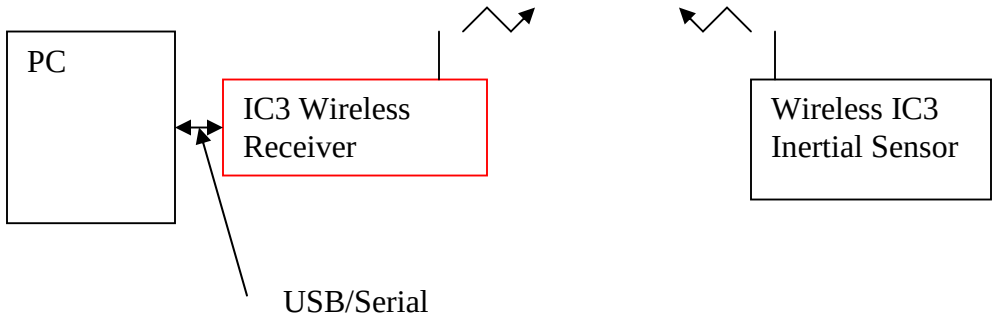
InterSense Wireless IC3 Receiver

Operational/ Technical Description

1. Overview:

The Wireless IC3 Receiver is a base station to connect a Wireless IC3 inertial sensing device to a personal computer through either a serial port or a USB port depending on the cable used.



The system is used to detect the orientation of an object that the remote inertial sensor is attached to. The sensor uses gyros, accelerometers and magnetometers to detect its yaw, pitch and roll. Typical uses are for sports training, virtual reality applications and simulation and training.

2. Technical Description

The IC3 Wireless Receiver is actually a transceiver that is based on a Chipcon Zigbee chipset but it does not implement the higher level Zigbee software protocol stack. There are two boards in the receiver package. The first is the radio board that has the Chipcon radio chip, a Pic microprocessor to handle the communication protocol between the PC and the Chipcon chip and a PCB antenna. The second board is a carrier board that converts the TTL output of the Pic processor to either USB signals or RS232 Serial levels depending on which cable is plugged into the carrier board.

The Chipcon 2420 radio used is a single chip Direct Sequence Spread Spectrum (DSSS) transceiver. Its supports data rates up to 250kbps with a 2 MChip/s chip rate. It uses O-QPSK with half sine pulse shaping modulation. The 2420 uses an input reference oscillator of 16MHz.

The integrated PCB antenna is a so-called Inverted-F type. The Inverted F antenna is a wire monopole where the top section is folded down to be parallel with the ground plane. The peak antenna gain is 5 dBi, the corresponding peak field strength is 90dBuV/m.

There is a balum to convert output of the chip to the single ended input of the PCB antenna.

The system does not do frequency hopping. It supports up to 16 channels spaced at 5Mhz intervals between 2404.6 and 2480.4 MHz.