Ultra-wide band radio transceiver for wireless data transmission

Technology #m10-004

“Lead Inventor: Peter Kinget Ph.D., Marco Crepaldi

Wireless radio technology for tracking object positions over limited areas:
Wireless radio technology is finding its way into an increasing number of devices with varied applications. Beyond the now ubiquitous WiFi, low power, low data rate implementations are emerging, including RFID tags common in workplaces, and wireless data loggers attached to everything from medical equipment to shipping containers. These devices are passively powered or required to operate on batteries for long periods of time. The challenge is to maintain data fidelity between transmission points without using costly (both in terms of power and money) synchronizing clocks and analog to digital converters (ADCs).

Transceiver for short range, ultra wideband data receipt and transmission:
The invention is a radio frequency non-coherent energy detection transceiver for short range, ultra wideband data receipt and transmission. The transceiver sends and receives data over short distances in small bursts, and is ultra low power. The design does not rely on a precise crystal oscillator clock, instead embedding timing information in the signal, and using a low power ring oscillator clock. The receiver is interference tolerant, and digitizes it using a threshold scheme instead of a more traditional analog to digital converter (ADC).

Applications: • Radio Frequency Identification (RFID) systems, where RFID tags are typically inductively powered, requiring low power operation • Real Time Locating System (RTLS) similar to GPS, but for tracking object positions over limited areas, such as a university campus, or hospital • Wireless data reporter in medical devices, such as glucose monitors or EKG • Wireless data loggers placed in shipping containers to monitor environmental conditions and package location during shipping

Advantages: • The design is ultra-low power by eliminating the need for a precise clocking device and an ADC • Architecture is much less expensive, and physically more compact than conventional designs • It is robust to interference from external sources or path delayed signals

Patent Status: Patent Pending

Licensing Status: Available for Licensing and Sponsored Research Support”

Patent No. 8,699,627

Inventors

Peter Kinget