

Teaching the electronic design and embedded system course with body sensor nodes

Abstract

The body sensor nodes armed with a MSP430 microcontroller, a IEEE 802.15.4 radio chip, a memory flash and a electronic amplifier circuits is proposed as an educational platform for electronic design and embedded system courses. The body sensor nodes are designed based on a commercial wireless sensor network (WSN) device that contains the microcontroller, radio chip and memory flash in a single platform. The WSN device also supplies the connection pins for I/O signals, ADC, SPI and UART functionalities, to control an electronic amplifier circuit. For electronic design courses, the ease of creating the body sensor node, will be hard to resist by the students. An electronic amplifier is designed and fabricated by the students in the laboratory in the electronic design courses. The WSN device is stacked on the top of the electronic amplifier circuit to prototype a new body sensor node. For the embedded system course students, the unique properties of TinyOS used as the operating system for the body sensor node allowed the students see the effects of the software in short time.