

BLIP: A New Tool for Instrumentation Education

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In recent years, interest in electronics among bioengineering students has been waning. In an attempt to revitalize spirit of “gadgeteering” in the bioengineering curriculum, we have developed a low cost (less than \$20) instrumentation device that is small and cheap enough to be built and owned by each student. A PIC16C765 microprocessor was programmed to implement the functions of a data acquisition system, signal generator, frequency counter, duration timer, and digital event logger. The device, known as BLIP (Breadboard Laboratory Instrumentation Processor), communicates to a host computer via USB 1.1 by imitating a standard computer keyboard. No special software is required on the host computer, as the device transfers data by “typing” it as if on a keyboard, allowing the data to be entered into any word processor or spreadsheet program running under Mac OS, GNU/Linux, or Windows. BLIP was introduced into the 2005 Bioinstrumentation course at the University of Pittsburgh. Each of the 40 students was given a set of parts and required to follow step-by-step instructions detailing the construction of BLIP. Almost all students successfully completed the construction within two weeks, and then utilized BLIP to observe various phenomena of electronic circuits in a series of experiments. An anonymous survey from the class revealed that, overall, the students enjoyed the hands-on nature of the experience and considered it a valuable contribution to their education. Many found owning the equipment appealing, implying an increased potential for life-long-learning.