

Title: Real experiments with sensor-to-USB interfaces

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Abstract:

We have developed simple, compact and easy-to-use sensor-to-USB interfaces that can convert various real-worlds signals – displacement, acceleration, temperature, pressure and many more – to digital signals that can be accessed by the application via the widely available USB port. The sensor-to-USB interfaces and the associated software application support experimental education by visualizing real-world signals in real-time on continuously updated charts or just by numbers. We provide open source hardware, software and communication protocol to aid developers to reproduce the unit, to teach how simply the interfacing can be realized by today's widely available electronic components or to provide a basis for developers for further improvement and integration into any application including GeoGebra. The communication protocol and interface hardware is general and simple enough to use in almost any operating system and programming environment.

In the presentation the architecture and communication protocol of sensor-to-interfaces will be detailed and we'll demonstrate the use of many different sensors including accelerometers, thermistors, optical sensors, pressure sensors, humidity sensors, pH sensors and even more. Educational experiments will also be presented including the monitoring of the motion of a pendulum, demonstration of ambient pressure, temperature and humidity monitoring, water level measurement and blood pressure monitoring. References can be found at www.inf.u-szeged.hu/noise/edudev.