Activity/Vibration Monitor Kit

Overview

The NODE-based Activity Monitoring Device is a compact, BLE-enabled tool that combines the nRF52832 controller, LIS3DH accelerometer, and SHT40 sensor for real-time motion and environmental data analysis. Designed for STEM education and IoT projects, it allows students to explore concepts like motion, speed, and gravity while enabling practical applications such as step counting, speed measurement, and environmental monitoring. With low power operation and mobile app integration, it bridges theory with hands-on learning, inspiring innovation in science and engineering.

Key Features

- Real-time motion tracking with 3-axis accelerometer.
- Bluetooth Low Energy (BLE) for seamless mobile connectivity.
- Compact, low-power design for portable and wearable use.
- Supports physics experiments like pendulum motion, velocity, and step counting.
- Multiple communication interfaces (I²C, SPI, UART) for easy integration.

Technical Specification

- Controller: Nordic nRF52832 SoC, ARM® Cortex®-M4F, 64 MHz
- Memory: 512 KB Flash, 64 KB RAM
- Accelerometer: LIS3DH, 3-axis, ±2g/±4g/±8g/±16g range, 12-bit resolution
- Wireless: Bluetooth Low Energy (BLE 4.2 / 5.0 compatible)
- Interfaces: I²C, SPI, UART
- Operating Voltage: 1.7 V – 3.6 V
- Form Factor: Compact, battery-powered design for portable use

Application

- Physics Experiments – Study pendulum motion, harmonic oscillation, gravity, and acceleration.
- Step Counting – Create a simple pedometer for detecting and counting steps.
- Velocity Measurement – Track acceleration changes over time and integrate to calculate velocity.
- Speed Monitoring – Measure real-time speed without extra sensors using accelerometer data.