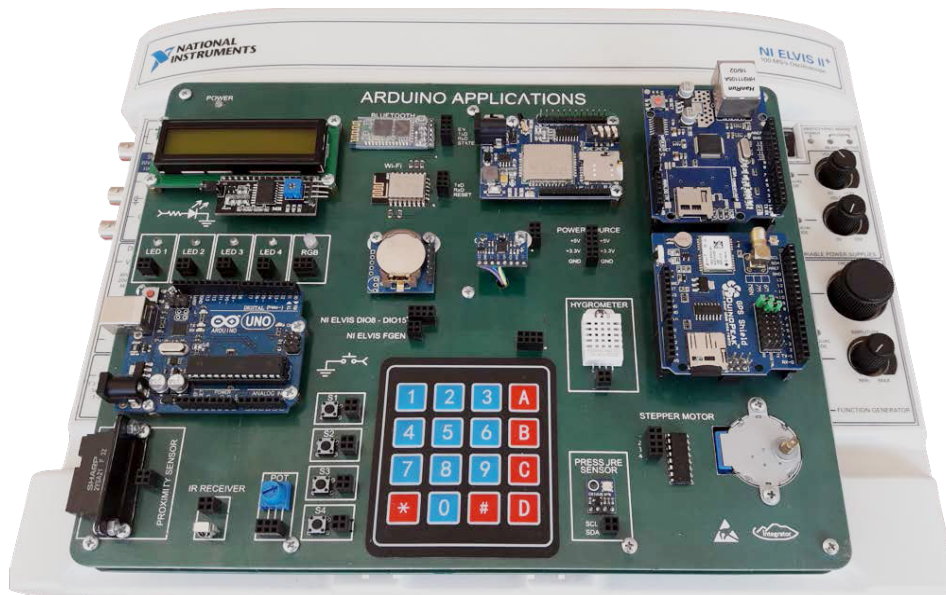


# Arduino Applications Lab



## Overview

The Arduino Applications Lab is based on the NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS II) platform used in conjunction with a specially developed Educational Board for conducting the labs. The Educational Board includes the Arduino platform and other devices. The programs, working in conjunction with the devices and the PC, are developed and uploaded into the platform using the Arduino IDE Environment.

The purpose of the test bench and the experiment's objectives:

- Study the operating principles of sensors and devices
- Get acquainted with various sensors and devices and their documentation
- Get acquainted with the Arduino platform
- Programming Arduino using the Arduino IDE Integrated Development Environment

## The Experimental Procedure

- The device documentation is studied. The electrical circuit is assembled in accordance with which the device is connected to Arduino. The obtained results are visualized
- The student studies the algorithm and demo program in Arduino IDE environment
- The student makes the required electrical connections on the Educational Board and on the Arduino and checks the operation of the demo program
- The student receives an individual assignment option formed in accordance with the demo program and executes it independently
- A report is created in accordance with the individual assignment option which includes the electronic circuit, project file and the saved digital diagrams and scope traces obtained during the experiment

# Arduino Applications Lab

## List of Labs

1. Introduction to Arduino. Digital and analog inputs/ outputs
2. Data readout from the keyboard and data output to LCD. Coded lock.
3. Working with temperature, humidity and pressure sensors. Meteorological station.
4. Step motor control.
5. Cellular networks.
6. Data transfer through Bluetooth. Working with an accelerometer and gyroscope.
7. Working with real-time clocks. Synchronization with the time server.
8. Working with GPS
9. Interrupts and timers.
10. Data transfer in an infrared range.
11. I2C data bus.
12. SPI data bus.
13. Energy saving.

