Table of Contents

Name of the exercise

Pico Board - Hall Effect Measurement

Responsible for the exercise

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Description of the exercise

Although designed as a very simple board for children, picoboard can be used as a real data acquisition board to gather data such as intensity of light (optical fibers), magnetic field (hall effect) or resistance measurement. Before any data measurement a calibration phase is needed. This exercise has the purpose to present one way that a hardware card (such as picoboard) can be interfaced with students programs (writen in C/Python/etc) and also how they can do real measurements with the software and hardware they have.

What will the students learn

- how to measure the hall effect using a very simple data acquision board
- resistance calibration
- how to read data (resistance measurement) using a serial interface from the scratch board
- sensor data visualisation

Duration

1 hour

List of material

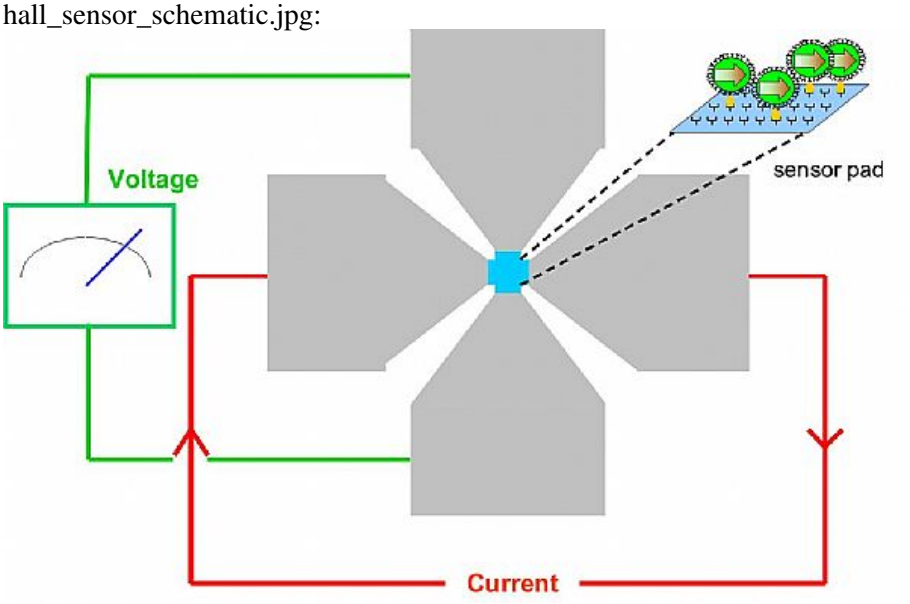
- adapted scratch board
- USB cable
- hall probe
- magnet
- custom board for hall probe, scratch board, ruler, magnet

Relevant information

http://www.sypris.com/test-and-measurement/magnetics-fw-bell/hall-effect-sensors
http://www.adc9001.com/index.php?src=03-three-axis-hall-probe
http://www.picocricket.com/picoboard.html
http://info.scratch.mit.edu/About_Scratch
http://info.scratch.mit.edu/Sensor_Board
http://scratch.mit.edu/

Documentation

- Microntroller_datasheet.pdf: Microcontroller datasheet
- hall_sensor_schematic.jpg:



- OperationalAmplifier_LM324.pdf: Operational Amplifier datasheet
- Picoboard_protocol.pdf: Picoboard protocol
- Picoboard_schematics.pdf: Picoboard schematics

Template for "Resistance Calibration"

- A_pico.py.txt: Picoboard class
- A_resistance_calibration.py.txt: Resistance calibration python template

Template for "Hall Effect"

- B_pico.py.txt: Picoboard class (B)
- B_hall_probe.py.txt: Hall probe python template

Python API for Scratch Board

- scratchboard.py.txt: Scratch Board - Python API for accessing sensor values

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This topic: Sandbox > DaqSchoolExercise14
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