



Telemark University College
Faculty of Technology

FMH606 Master's Thesis

Title: Measurement, Monitoring and Control System using Arduino

TUC supervisor: Hans-Petter Halvorsen

External partner: National Instruments

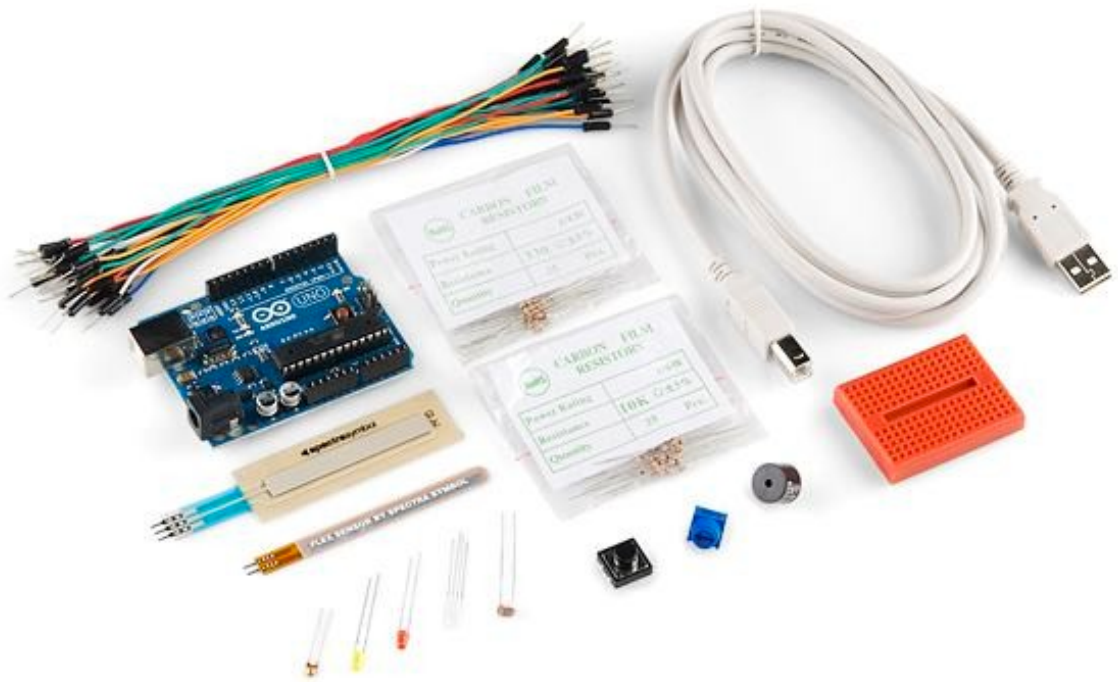
Task description:

In this project we will design and develop a Measurement, Monitoring and Control System using the Arduino platform.

Such a Measurement and Control system should be developed both using LabVIEW and Visual Studio with C#.

We will test the system on different laboratory processes and with different sensors available at TUC.

Below we see an example of the Arduino Uno platform and different accessories available:



The Arduino platform has 14 digital I/O channels and 6 analog I/O channels.



The following topics should be investigated in this project:

- Get an overview of the Arduino platform in general.
- Get an overview of the “NI LabVIEW Interface for Arduino Toolkit”. The “NI LabVIEW Interface for Arduino Toolkit” helps you interface with the Arduino microcontroller using LabVIEW. With this toolkit and LabVIEW, you can control or acquire data from the Arduino microcontroller.
- Test the Arduino platform on different laboratory processes, such as the Air Heater and different water tanks available at TUC.
- Test the Arduino platform on different sensors available at TUC, such as ultra sound sensors, temperature sensors, etc.
- Develop a Measurement, Monitoring and Control System using the Arduino platform in LabVIEW.
- Develop a Measurement, Monitoring and Control System using the Arduino platform in Visual Studio and C#.
- Create Lab Assignments and Training material.
- Explore the possibilities for using the Arduino platform for Wireless Communication.
- Delivery of written report following guidelines from the faculty.

Task background:

Arduino is an open-source electronics prototyping platform. Arduino can sense the environment by receiving input from a variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators.

The microcontroller on the board is programmed using the Arduino programming language (based on Wiring) and the Arduino development environment (based on Processing).

Arduino projects can be stand-alone or they can communicate with software running on a computer.

Arduino can be used with different programming languages such as C# and LabVIEW.

Student category: SCE students

Practical arrangements:

Signatures:

Supervisor (date and signature):

Students (date and signature):