



Telemark University College
Faculty of Technology

FMH606 Master's Thesis

Title: Mobile and Wireless Technology for Measurement, Monitoring and Control

TUC supervisor: Hans-Petter Halvorsen

External partner: National Instruments

Task description:

During the last years the focus on Wireless and Mobile systems has increased enormously. Still, the process industry is lacking behind in these fields.

In this project we will design and develop Measurement and Control Systems using Wireless and Mobile Technology. We will explore different Wireless systems together with different kind of Mobile Technology.

Below we see different equipment and technologies that will be used in this project:



The equipment shall be tested out in conjunction with the weather station available at TUC.



The following topics should be investigated in this project:

- Get an overview of Smartphones and Tablets in general, and the different platform available.
- Get an overview of different Wireless systems, such as Wi-Fi, ZigBee, etc.
- Get an overview of the mobile platforms from National Instruments and other vendors of interest.
- Use the “Data Dashboard for LabVIEW” in order to create an application used for Measurement, Monitoring and Control.
- Web Apps or Native Apps? Building apps for mobile devices (Smartphones and Tablets) can be done in different manners, such as building a native app, using the web and a web browser or control an application using remote desktop applications. Explore these different methods.
- Different vendors have now started to build such systems where the device is compatible with Tablets or Smartphones using an app created for the purpose. It already exist cameras, oscilloscopes, DAQ devices (e.g., NI cDAQ-9191), etc. Some of these solutions also need an additional connector, which can be plugged into the tablet or the smartphone. Explore some of these systems.
- Get an overview of available tools and programming languages for developing applications for Smartphones and Tablets in general.
- Create specifications and a prototype for a Mobile system, which can be used for Measurement, Monitoring and Control.
- Delivery of written report following guidelines from the faculty.

Task background:

TUC has the latest wireless equipment available, which will be used in this project.

Smartphones and tablets are growing in popularity and changing the way we live our lives. Because of their network connectivity, smartphones and tablets are great tools for remotely viewing measurements; however, their small size and processing power also make them effective for portable measurements. Smartphones and tablets can offer engineers a way to remotely measure and control systems and can be a new platform for portable measurements.

Building an application for a smartphone or tablet may not be a trivial task. National Instruments has recognized that many of its customers have limited or no expertise programming for mobile platforms. To help engineers take advantage of these devices, NI has created several tools for remotely viewing measurements and connecting to data acquisition hardware.

Student category: SCE students

Practical arrangements: None

Signatures:

Supervisor (date and signature):

Students (date and signature):