



**Telemark University College**  
Faculty of Technology

## **FMH606 Master's Thesis**

**Title: System Integration of Wireless Technology in a DeltaV system**

**TUC supervisor: Professor Saba Mylvaganam, Hans-Petter Halvorsen, M.Sc.**

**External partner: National Instruments, Emerson Process Management**

### **Task description:**

Sensor networks are very often distributed spatially to function autonomously but have extensive co-operation in providing information on various measurands depending on the applications. Typical examples are temperature, sound level, pressure, humidity, light intensity, concentration of pollutants etc. in a given environment. Increasingly sensor networks are used in intruder detection, estimating vehicles/people present in a given area under supervision. Wireless sensor networks (WSN) are being implemented in military, civilian and industrial applications. Following this trend, we want to look into the following:

1. Short survey on WSN in cross platform applications.
2. Improving the functionality of existing WSN system based on NI modules and DeltaV systems
3. Integrating NI WSN in a DeltaV platform
4. Testing remote operations
5. System Integration
6. Report using template of TUC with systematically archived data sets and software

### **Task background:**

Wireless communication has been implemented successfully in phones and computers. WSN is now implemented in different applications in healthcare, condition monitoring and automatic surveillance in buildings, unmanned supervision and control in the process industries. The challenge lies in automating decision making based on the values process parameters observed by the WSN, preferably without too much of human intervention, thus leading to a truly robust WSN based system.

Currently, the wireless sensors have been used for monitoring, where a human operator must decide whether the process parameters should be changed or not. The objective is that the technology will prove to be robust enough to also be used to process control where the



changes in the industrial processes should happen automatically without human intervention. This will be the next major challenge for systems based on wireless technology. Wireless technology has many potential benefits for remote monitoring applications; however, it has been slow to see adoption in industry because of the complexities of programming and deploying a reliable, secure, and high-performance wireless system.

**Student category:** SCE students. Prerequisite: Experience with WSN is mandatory.

**Practical arrangements:** The faculty has the latest wireless sensor modules from National Instruments. The sensor lab has other facilities for testing sensors. The project will use the DeltaV lab for the practical implementations. Close collaboration with NI is expected. Depending on the need new modules will be purchased during the course of the project. The project is suitable for students with experience in LabVIEW programming.

**Filename:** System Integration of Wireless Technology in a DeltaV system.rtf

**Signatures:**

Student (date and signature):

Supervisor (date and signature):