FM4017 Project

Title: Development of Weather System with Interface to IoT GraphQL Data Platform

USN supervisor: Hans-Petter Halvorsen

External partner: Dimension Four

Task background:
USN campus Porsgrunn has a Weather Station located on the roof of one of the buildings. The Weather System is based on a Capricorn 2000ex Weather Station with Weather MicroServer from Columbia Weather Systems.

Dimension Four (https://dimensionfour.io), a local company in Grenland Norway has developed a new IoT platform. The IoT platform uses GraphQL and MQTT.

Task description:
In this project the following activities should be performed:

- Give an overview of the existing Weather Station at USN and establish connection and retrieve data from the station. The Weather Station has Modbus and REST API Interfaces.
- Give an overview of existing IoT solutions for Datalogging and Monitoring in general, some examples are Azure, ThingSpeak, Dimension Four, etc. Compare and discuss the different IoT platforms and their features, advantages and disadvantages and suitable applications for the different IoT platforms. Discuss especially Data Security issues within the different platforms and protocols
- Give an overview of the Dimension Four IoT platform and their GraphQL API.
- Create a proper Data Structure within the Dimension Four platform for storing Weather Data
- Create a Datalogging Module that retrieves data from the Weather Station and stores the data within the Dimension Four IoT platform.
- Create a Datalogging Monitoring module that present the Weather data (that are now stored in the Dimension Four IoT platform) in intuitive and user-friendly way. This should preferable be a Web Application.
- The system should be Open-source and should be available at GitHub with proper documentation.
- GitHub should be used during project planning and development
- The system should be properly documented in form of a technical report, documentation in GitHub and on YouTube.

Student category: IIA

The task is suitable for students not present at the campus (e.g. online students): Yes, but some parts of the project need to carried out at campus Porsgrunn.

Practical arrangements: None

Signatures:

Supervisor (date and signature):

Students (write clearly in all capitalized letters + date and signature):