

# Wind Farm HMI

## System Description

### Abstract

This document describes a systems which compiles sensor data from neighboring arrowhead clouds using the datamanager then presents it to a wind farm supervisor.



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# 1 Overview

This document describes the Wind Farm HMI (HMI) Eclipse Arrowhead system, which exists to fetch data from a datamanager in a different arrowhead local cloud and present this information to a human operator.

The information presented is to give the human operator enough knowledge about each wind turbine as to be able to make informed decisions about the maintenance for the wind turbines and also warnings when such components have increased chance of failure.

The information that is fetched from the datamanagers are assumed to be from a condition monitoring box which is located on a wind turbine which has its own local cloud.

The rest of the document is organized as follows. In the remainder of this section we comment on the status of this document. In Section 2, we outline the major delimitations of the system, which is a work in progress. Section 3 presents how the Wind Farm HMI is used in the local cloud and in the inter-cloud network. Finally, In section 4, we describe which services the Wind Farm HMI consumes. *Readers of this document are assumed to be familiar with the DataManager proxy service. For more information about that service, please refer to the Proxy service description in the DataManager core system.*

## 1.1 Status of this Document

This document presents the current state of the HMI. However, since the Eclipse Arrowhead Framework and its core services are in developement some things are subject to change. The communication with the datamanager is especially fragile where there were problems using the existing datamanager.

## 2 Important Delimitations

Since the HMI was made for the course D7042E in Itu with focus on IoT and Arrowhead development, much of the user interface is barebones as it is not relevant to the course. Some changes had to be made to the current version of the datamanager, these changes were made after a dialogue with the maintainer of the DataManager core service to make it possible to use the service. The specifically made the datamanager less secure as the changes pertained to the access list.

The HMI system works in the way that it hosts a non arrowhead compliant http rest interface as a mean to communicate with the angular frontend where the information is displayed. As such this interface require a SySOP certificate for the local cloud in the browser to access, this is instead of using a Username, password protected domain.

## 3 System Role

As stated in Section 1, the HMI system performs two roles. Firstly it compiles information from several sensors in several neighboring clouds. Secondly it displays this information on a domain page where the wind farm administrator has access.

### 3.1 Data Models

Since the HMI system uses the datamanagers services it is wholly reliant on the datamanager proxy service's datamodel which uses SenML.

The data that is compiled has a json structure which was made to accomodate the angular json parsing in order to make use of the angular *for each* functions. As such the data is structured in json arrays whose elements are json objects with a name and a array which contain the childre.

## 4 Services

As mentioned previously the Wind Farm HMI does not produce any arrowhead-compliant services as such we will focus on the services which is consumed by the HMI.

### 4.1 Consumed Services

#### 4.1.1 **Orchestration**

This service is consumed in order to find all the datamanager proxy services in neighboring clouds and set up an accesspoint in the form of a gateway to be able to access these datamanagers.

#### 4.1.2 **Proxy**

This service is consumed in order to access the sensor values from the Wind Turbine sensors.

#### 4.1.3 **Gateway**

This service is consumed when making requests to the datamanagers in the neighboring clouds.

## 5 Revision History

### 5.1 Amendments

No.	Date	Version	Subject of Amendments	Author
1				

### 5.2 Quality Assurance

No.	Date	Version	Approved by
1			