

# Ambient Condition Information System

## Requirement Specification

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### User's Perspective Requirement

- The System has to present the information of the ambient environmental conditions on a dashboard. The conditions of interest are (1) temperature & (2) humidity.
- The ambient environment conditions should be as reported at an interval that can be defined by the user
- The information system should be portable as the system is intended to be deployed to monitor the ambient conditions at warehouse, storeroom or lab environments
- There should be some form of alerts when the temperature or humidity exceeds the defined thresholds that the user set
- The user should also be able to review past readings of the temperature or humidity for self-service comparisons on a web application
- The user is able to view the existing ambient environmental conditions along with weather conditions (e.g., external temperature, atmospheric pressure, wind speed, expected sun-rise and sunset) reported by metrological office

### Designer's Perspective Requirement

- The information system shall be built using a Microcontroller with WIFI configured to connect to the network
- The Microcontroller shall connect to the following external modules:
  - DS18B20 Temperature sensor,
  - DHT11 Humidity sensor,
  - Breadboard
  - Wires
- The main logic shall reside in the Microcontroller to probe the DS18B20 and DHT11 readings and display them on a Web Application dashboard page on the server via a WebSocket or API function
- The main logic shall also call the OpenWeatherMap API to retrieve the following information
  - MIN and MAX atmospheric temperature
  - Weather and cloud conditions
  - Wind speed and direction
  - Atmospheric pressure
  - Sunset and sunrise timing

- The user can interact with the dashboard page on the Web Application to display the information in either text or graphical chart format, where the graphical chart format is to show the real-time movement of the readings
- The Microcontroller shall send an alert to the Web Application server when the ambient temperature OR the humidity crosses the set threshold values
- To implement some level of security, all the IP addresses within the network must be whitelisted for data access (the main Microcontroller, the web server, any devices accessing the web server)
- All API calls and data transactions shall be properly logged to help with debugging and troubleshooting. The log data should be purged after every 3 days from the Microcontroller system to main storage space

### Constraints

- The form factor must be small and portable so the design should require either the Raspberry Pi or Arduino.
- The availability of constant power supply to keep the information system perpetually on at the site of deployment. Power bank could be used but it will require a change out every estimated 3-4 days
- Coverage of the WIFI network may not be as universal as expected, so certain blind spots will render the data not able to be sent to the web application server
- Limited security for data and network protection