***ESD-RTS MINI PROJECT REPORT***

**REAL TIME THERMAL MONITORING AND LOGGING SYSTEM**

**Sixth Semester Electronics and Communication Engineering**

*Submitted by*

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1. **ABSTRACT**

Thermal power plants have a multitude of systems that need a very specific range of temperature and humidity in order to function. A single deviation into suboptimal temperatures can disrupt the entire plant’s yield. This is a real time system that helps constantly keep check on a fluctuating industrial unit, by allowing all systems to work only when the fluctuations are below a specified threshold. This involves the use of a dynamic prioritising software which can change the order in which it processes tasks based on the need of the time and temperature conditions. A simple function que-scheduling approach is used, with queue-based priority line up. A handy addition to this project is the logging of temperature and humidity data to a website which enables maintenance of these plants by the touch of a button, remotely from anywhere in the world

1. **BLOCK DIAGRAM**

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1. **COMPONENTS INTERFACED**
2. Temperature Sensor
3. Humidity Sensor
4. Wi-Fi Module
5. LEDs
6. DC Motor
7. Buzzer
8. Hardware interrupt buttons
9. **METHODOLOGY**

* The first area of this project involves dealing with the temperature and humidity sensors. After being interfaced with STM32 they give a binary value of the actual temperature and humidity values. The accepted values we’re looking at is any fluctuations between *2.5 to 5 degrees Celsius, and 8-12 atmospheric bars*. This task of checking the conditions and comparing it with the threshold then becomes the task of highest priority. No other task can be performed in the power plant if the fluctuations are above these specifications.
* Once it clears this, we reach the main power plant systems. To model these systems, we have created a simple three task equivalent where, on pressing a specific button you can activate the respective task i.e.- LED up count, LED down count, motor rotation and a buzzer. Four buttons have been installed to enable these tasks.
* These tasks although have a chain of priorities which they must follow as well. There are 3 main chains:  
  *> buttons pressed between 0 and 5 seconds* – (LED up, LED down, Motor, Buzzer)  
  > *buttons pressed between 5 and 10 seconds* – (LED down, Motor, Buzzer, LED up)  
  > *buttons pressed between 10 and 15 seconds* – (Motor, Buzzer, LED up, LED Down)
* The data of the temperature and humidity as is being sensed and compared is also parallelly being uploaded to a website where we can access it. The status of all the devices i.e LED, Buzzers etc can also be monitored on the website through the ease of access GUI made. The Wi-Fi module which is interfaced to STM32 allows the upload and downloading of this data.
* The issue we faced while simulating this was the addition of multiple priorities and how to allow the temp and humidity sensors to maintain highest priority while only creating dynamics for the lower priorities. Another issue was making sure all data is sensed, uploaded and priorities are set within the time frame of a single delay (one second) before it changes the next second, and making sure the respective button’s task also gets carried out.

1. **CODE**
2. **REFERENCES**1.