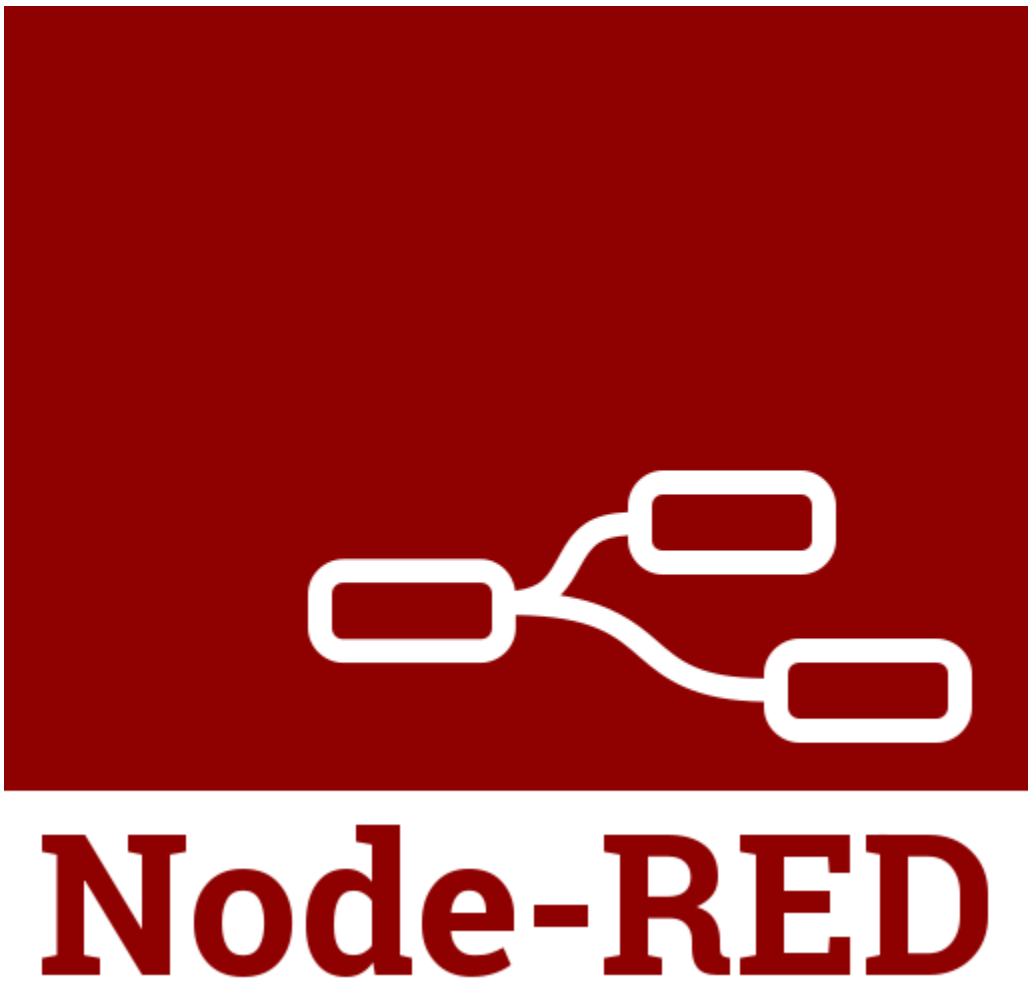
Basic HMI Dashboard



Semester 4 HMI

Orientation Challenge

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Student: Andre Sanao

Course: Smart Industry

Introduction

Human-machine Interaction and Control also known as HMI is a subject for semester 4 where we learn how to develop modules which humans are using to either interact, monitor and/or control a machine, process, data, etc. These are then displayed in a dashboard to create an insight of what is happening in a smart industry. In this assignment, we are to explore the basics of Node-Red where implement what was demonstrated in the workshop. We use a user interface palette to design a dashboard for users from sensor data. In the following section will be a short report of what I have learned and executed using the features of Node-Red.

Procedure

During the IOT workshop, we learned how to install Node-Red and create flows to explore the basics. We also learned how to connect and send string data using an ESP32. With the ESP32, we connected to an MQTT broker called 'Mosquitto.org' and subscribe to a topic and inject message payload. Using this knowledge, I used to the ESP32 to gather data from a DHT22 sensor. DHT22 is both a temperature and humidity sensor. I created topics for these sensor and push these collected data into the dashboard. In the figure below is a simple user dashboard the user can monitor the temperature and humidity of the room as well as a graph history of the sensor in real-time. With this dashboard, the user is well aware of the indoor climate and can control the values using other hardware.

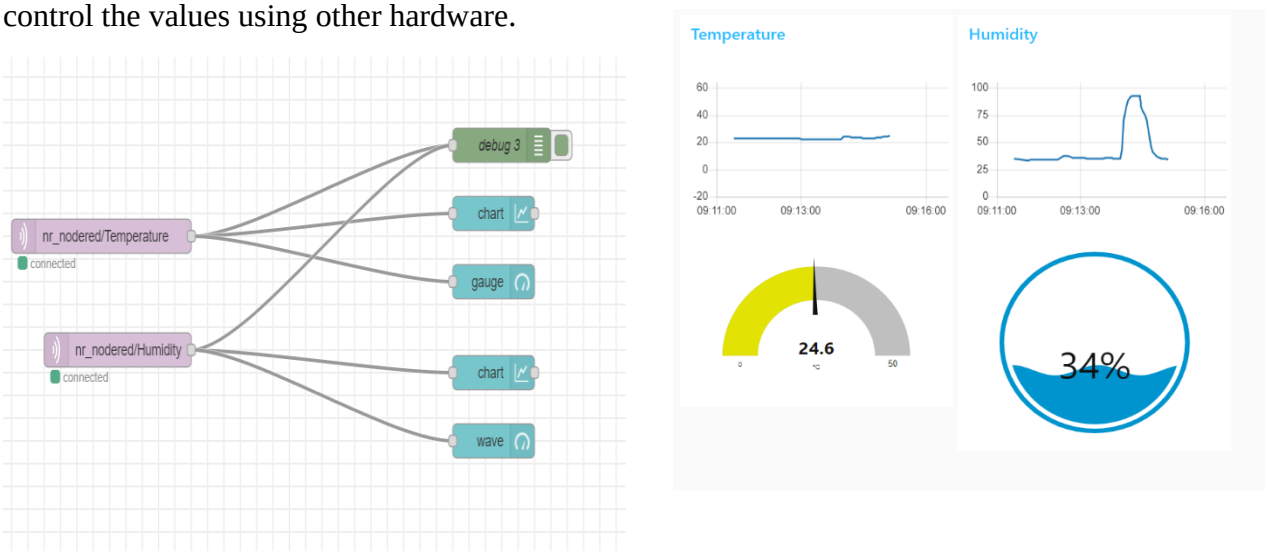

Figure 1 Node-Red flow and dashboard

Conclusion

To conclude this report, creating the dashboard a simple enough however I had to create 2 topics from the data gathered from the sensor. I was planning on creating a JSON where I have all the data sent in one topic. I got stuck because there was no setting from the graph block to take a specific message that is being parsed by the function block. I have learned and gained new knowledge using the dashboard and I am looking forward in the advance phase of HMI.