

# **INTERFACE ARDUINO WITH NODE-RED TO MONITOR THE TEMPERATURE AND HUMIDITY ON A WEBPAGE**

## ***Project Report***

Submitted in the fulfillment of the requirements for the

## ***IOT-WORKSHOP***

## ***22SC1209***

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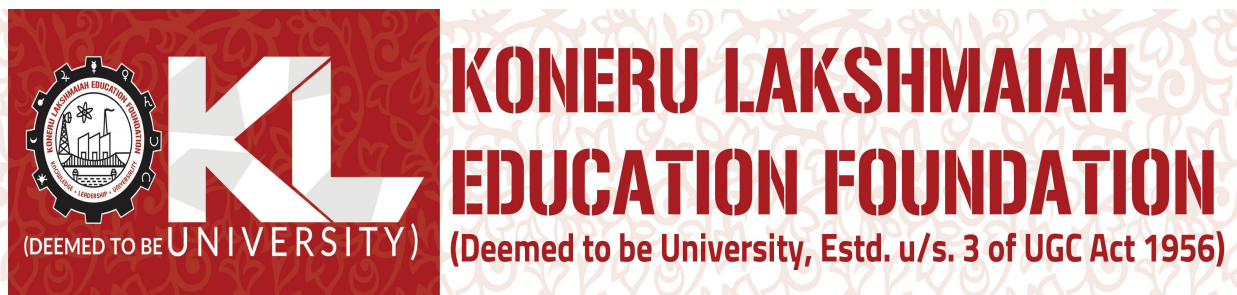
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## **Declaration**

The Project Report entitled “INTERFACE ARDUINO WITH NODE-RED TO MONITOR THE TEMPERATURE AND HUMIDITY is a record of Bonafede work of G.Sravya(2200010126),L.Omkarini(2200010132),K.Indupriya(2200010133),S.Sathya bhavani(2200010136),Jessica(2200010171)submitted in partial fulfillment for the subject titled Project Based Learning-I(22SC1209) in Dept of ECE, KL University. The results embodied in this report have not been copied from any other departments/University/ Institute.

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## **Certification**

This is to certify that the Project Report entitled “INTERFACE THE ARDUINO WITH NODE-RED TO MONITOR THE TEMPERATURE AND HUMIDITY ON A WEBPAGE” is being submitted

by G. Sravya(2200010126), Omkarini.L(2200010132), K. Indupriya(2200010133), S. Sathya bhavani(2200010136); Jessica(2200010171) in partial fulfillment for the subject titled Project Based Learning-I(22SC1209) in Dept of ECE, KL University is a record of Bonafide work carried out under our guidance and supervision. The results embodied in this report have not been copied from any other departments/ University/ Institute.

**Signature of Examiner**

**Signature of Supervisor**

## Acknowledgement

It is great pleasure for me to express my gratitude to our honorable President Sri.KoneruSatyanarayana, for giving the opportunity and platform with facilities in accomplishing the project based laboratory report.

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## **ABSTRACT**

Node-Red is a visual tool for non-programmers to work, it can be used to build application faster. Node-RED can be used to easily interface hardware devices, APIs, and other online services together in new and interesting ways. Node-RED is an open-source IOT tool and has been implemented by the IBM Emerging Technology organization. It is written in JavaScript and works on the NodeJs platform.

Node-Red operates on a module-based approach where predefined modules are connected graphically to perform the sequence of operations on Node-RED or in other words, it directly accesses data from microcontroller boards like Arduino, Raspberry Pi using the predefined port no. or PIN. In we were going to send DHT11 sensor readings to the Node-RED dashboard using Arduino.

In this we are going to use Arduino and Node-RED software to estimate the temperature and humidity in the air through web page

## **CHAPTER 1: INTRODUCTION**

Arduino controller system is used for measuring the temperature and wetness of the devices ,pressure,and height measurement, The setup contains the height measuring device and a measuring or controlling instrument .In this work , they proposed an arduino UNO with Raspberry Pi data processing unit. Along with this setup ,a cube satellite is included here to supply the data of weather has advantages like ease of construction ,portable device ,price is economical ,low power ,and a reliable system

.However there are some disadvantages like not used in long-distance while powerful transceiver sections are not present , and the gas balloon is also hauling ,and parts could be broken in the rain or during practice .Alternative energy panel method did a significant role in measuring the aforementioned parameters. The apparent statistical data are first collected and then sent by the use of a GSM module through the receiver.

A server is used here for connection and collection of information. Weather surveillance development system can be used ingathering real-time information as well as for transmission.

## **Chapter 2: Literature survey**

The DHT11 is a popular 3-pin sensor that can measure temperature and humidity. The sensor works with a one-wire protocol and is easy to use with development boards like Arduino. The Vcc pin of DHT11 is connected with Arduino's 3.3v pin, and the GND pin is connected with Arduino's GND pin. While the data pin is connected with the 2nd pin of Arduino. Once the connections are done, my hardware looked like this.

As you can see I have used simple female to male connecting wires to make the connections. The complete set-up powered by the USB port connected to my computer.

## **Chapter 3: Requirements**

### **Hardware components:**

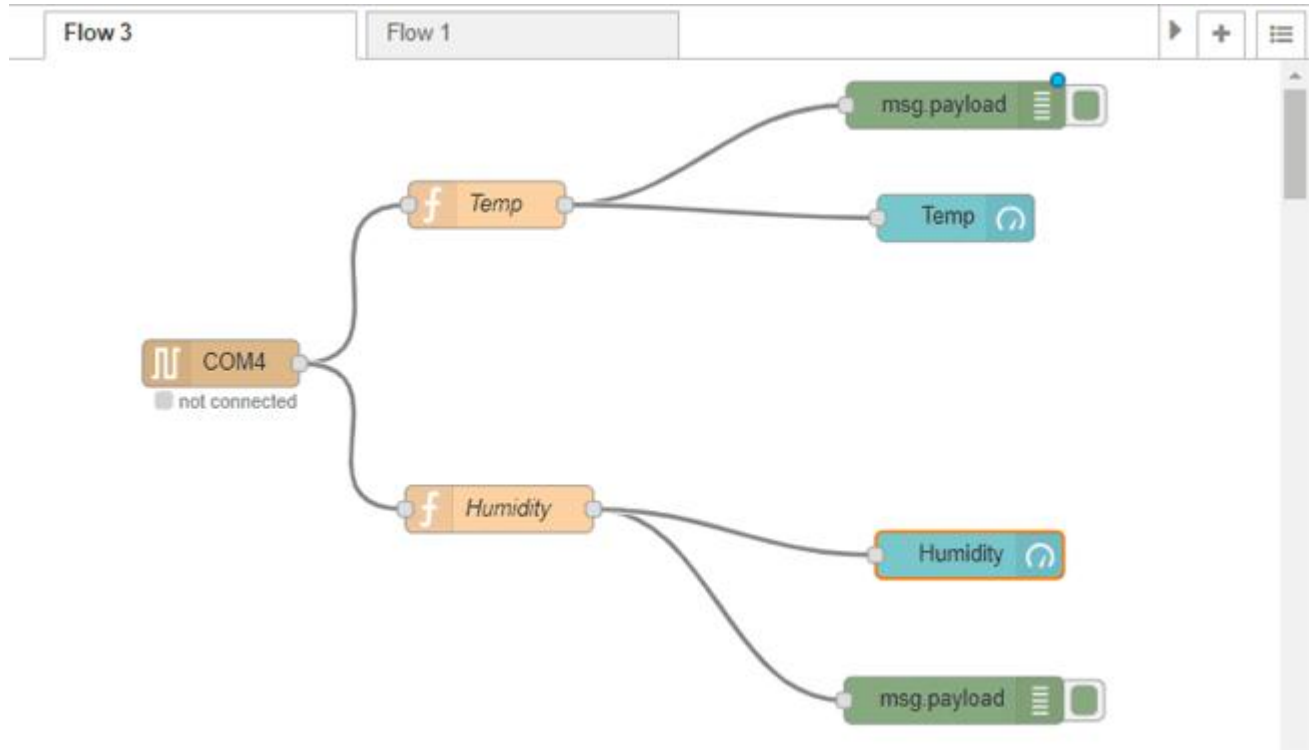
- |          |                      |          |
|----------|----------------------|----------|
| <b>1</b> | <b>Arduino board</b> | <b>1</b> |
| <b>2</b> | <b>DHT11 SENSOR</b>  | <b>1</b> |
| <b>3</b> | <b>JUMPER WIRES</b>  | <b>3</b> |
| <b>4</b> | <b>Bread board</b>   | <b>1</b> |

### **Software apps and online services**

- **Arduino IDE**
- **Node.js**
- **Node-RED**



## Chapter 4: Methodology



Firstly setting up node –RED ,install the Node.js from Node.js home page .when open a command prompt and run the following command to ensure if installed correctly .as the Node.js it doesn't have arduino nodes ,serial node and the dashboard. Secondly run the Red Node .Node library is the list of odes that representative of hardware ,protocols and software features associate with devise . We use .Arduino Uno, DHT 11 sensor to measure temp and humidity.

Node-red software to display the temp and humidity reading and connected a fan to Arduino .When the temp is greater than given temp fans will turn on

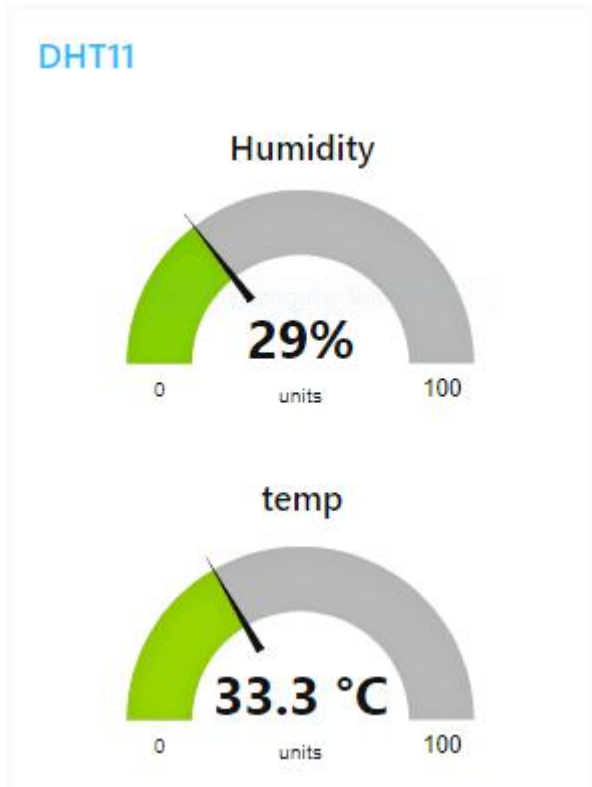
## **Chapter 5: Theoretical Analysis**

During the experiment with Arduino, we can observe the change in the temperature and humidity levels. DHT11 Module features a temperature & humidity sensor complex with a calibrated digital signal output. The exclusive digital-signal-acquisition technique and temperature & humidity sensing technology ensure high reliability and excellent long-term stability. This sensor includes an NTC for temperature measurement and a resistive-type humidity measurement component for humidity measurement. These are connected to a high-performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability, and cost-effectiveness.

## Chapter 6: Simulation and Results

Now flow is ready to deploy. We can deploy a flow on Node-RED using the deploy button.

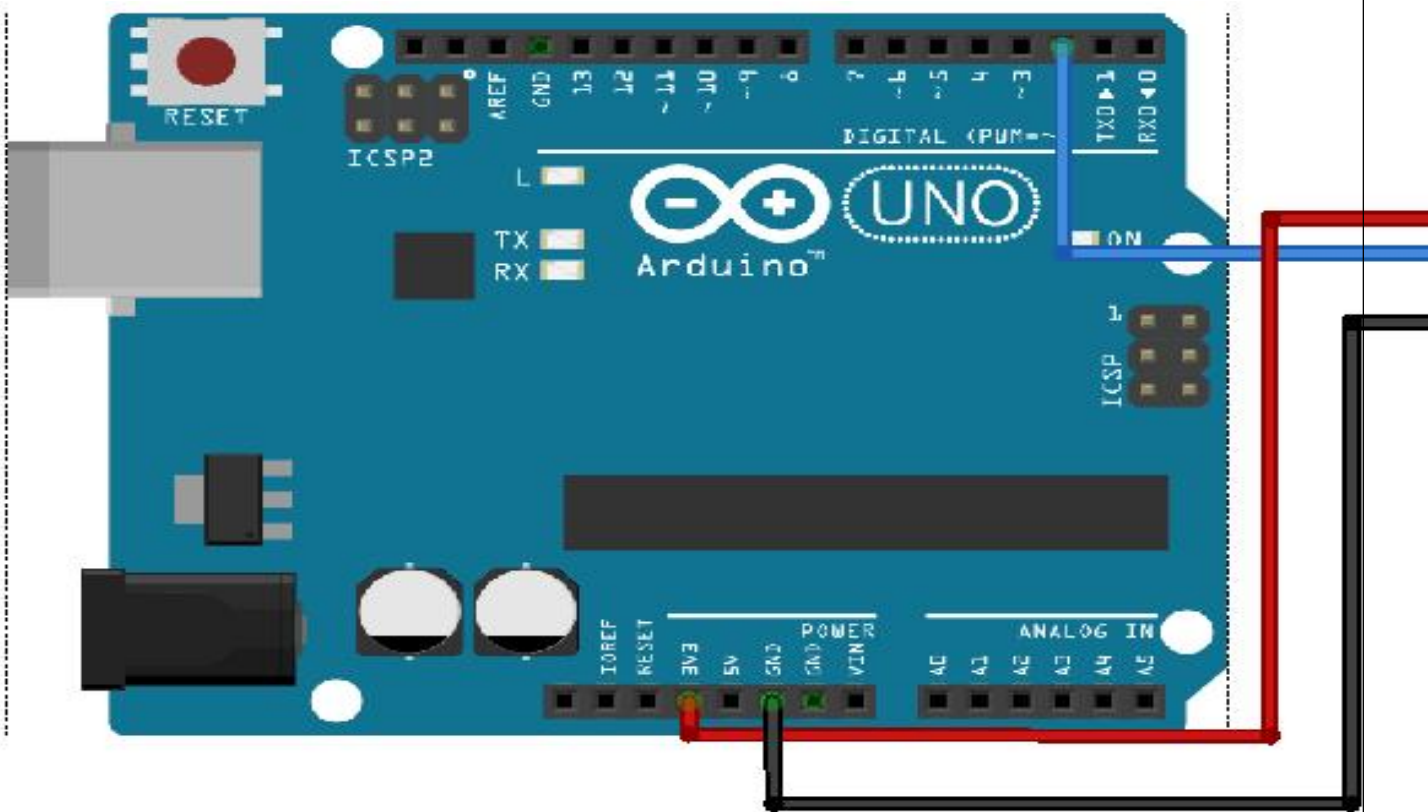
Node-RED Dashboard will look like this:



By forwarding the port in your router, this webpage can be accessed from anywhere over the internet. So this is how Node-RED can be used to do graphical programming and used to build IoT-based applications.

## Chapter 7: Hardware implementation

1. Give the connections to the Arduino board as shown in the connection diagram.
  2. Open Arduino IDE in the computer
  3. Create new file File\_-- New
  4. Type your program and Save it in appropriate location in your computer.
  5. Compile your program by clicking Verify option in the menu.
  6. Once the program compiled successfully, connect the Arduino board to the computer using USB Cable.
  7. After connecting, go to Tools ---- Board --- Select Arduino/Genuino Uno option
  8. After selecting board, go to Tools ---- Port --- Select Arduino Uno COM port 3 (name may Appear differently for other computers).
- \*\*Note that this port option will be displayed only when board is connected to computer**
9. Now upload the program to the Arduino board by clicking Upload option.
  10. Once the program uploaded successfully, open serial monitor window in Arduino IDE to see The value of DHT sensor. When you give motion Infront of sensor, observe the value changes in serial Monitor
  11. Now, we have install a software applications Arduino IDE, Node.js, Node-RED



## Chapter 8: Conclusion and Future scope

The OS-based Application based system has 225,000 repos with much different input and output node available.

Using various Nodes we can also send the data to different IoT platforms or Online servers Like Firebase, Microsoft Azure, IBM Watson

Using different API present within the node red like JSON, HTTPS etc will help you to connect the service Directly with your mobile applications or online servers also.

Not only Creating the local MQTT Server connection, but you can also create the connection with the online server by using various MQTT broker which is easy to install in node red like Mosquitto, HiveMQTT, CloudMQTT, Predix, and many others which uses the online storage database.

## **REFERENCES**

1.IOT design pro

2. <http://localhost:1880> to access red node

3. <http://localhost:1880/ui> to access Node-RED dashboard