Humidity and Temperature Sensing System

1. Abstract

Our projects presents the calculation and display of humidity and temperature using Arduino. it is based on Arduino temperature and humidity sensing DTH11 sensor for measurement and it is distinctive because it not only reads the value of temperature and humidity from sensor but also stores and display the data on screen (serial monitor) and other devices like (firebase, Thing speak) and in this project we have used firebase in which data can be shown.

Keywords: IOT, Arduino, Sensors

2.Introduction

Almost all the activities which we are surrounded have impact on temperature. An accurate calculation of temperature and humidity is necessary and important factor in many fields and science factor. The constant observation of temperature is crucial in many application like food industry, manufacturing factory, pharmaceutical industry and for commercial purpose of temperature sensing we have analog and digital temperature sensors. Temperature sensors those who have temperature-dependent functions can be measured using resistors, semiconductors like diodes, thermocouples and thermistors. The main objective of our project is to overview the exact value or data of the temperature and humidity in our surrounding or anywhere and in very less cost and this is possible due to the use of Arduino in our project. The sensor used is DHT11 temperature sensor. This sensor consists of temperature measuring functionalities and main advantages of using DHT11 is that it is less expensive and less in weight and small in size which means IOT in short. We have connected sensor with Arduino using jumper wires. The temperature is received using the sensor DHT11 and is read, stored and displayed by the Arduino.

3.Literature Review

M Rahaman Laskar et al. have presented paper on the weather forecasting and humidity sensor (DHT11), pressure and altitude sensor (BMP180) and accelerator (ADXL-335). Arduino is used for data processing he have used cube satellite through which it is possible

to know the information of weather .gas balloon is used to hold and carry the cube satellite. This process is very simple because it is portable, low cost, reliable and low power consuming. But there are some limitation as some devices cannot be communicating for the long distance [1].

Vinayak Aappasaheb Pujari et al. have presented the system that uses the solar power panel. This system is used to monitor temperature, wind speed, wind direction, humidity and rain. The sensed data will be sent to GSM module and through gateway to the personal computer. A server is connected to the database [2].

Prof. C. H. Chavan et al. have presented their system to develop wireless sensor network for an agricultural environment. This system uses the Wireless Sensor Networks which consisted of radio frequency transceiver, sensors, microcontrollers and power sources. Hardware of this system includes 8 bit AVR, ZigBee, Blue tooth module, temperature, humidity, soil moisture sensors, LCD. This system is reliable and efficient for agricultural parameters monitoring [3].

4.Components used

Arduino

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world.

ESP8266 WIFI module

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability. This small module allows microcontroller to connect to Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. It is widely used in networking, smart home project when it is connected to the Wi-Finbsp; router. It can be used for remote monitoring of home appliances, bedroom temperature and humidity, and controlling home appliances by the mobile phone.

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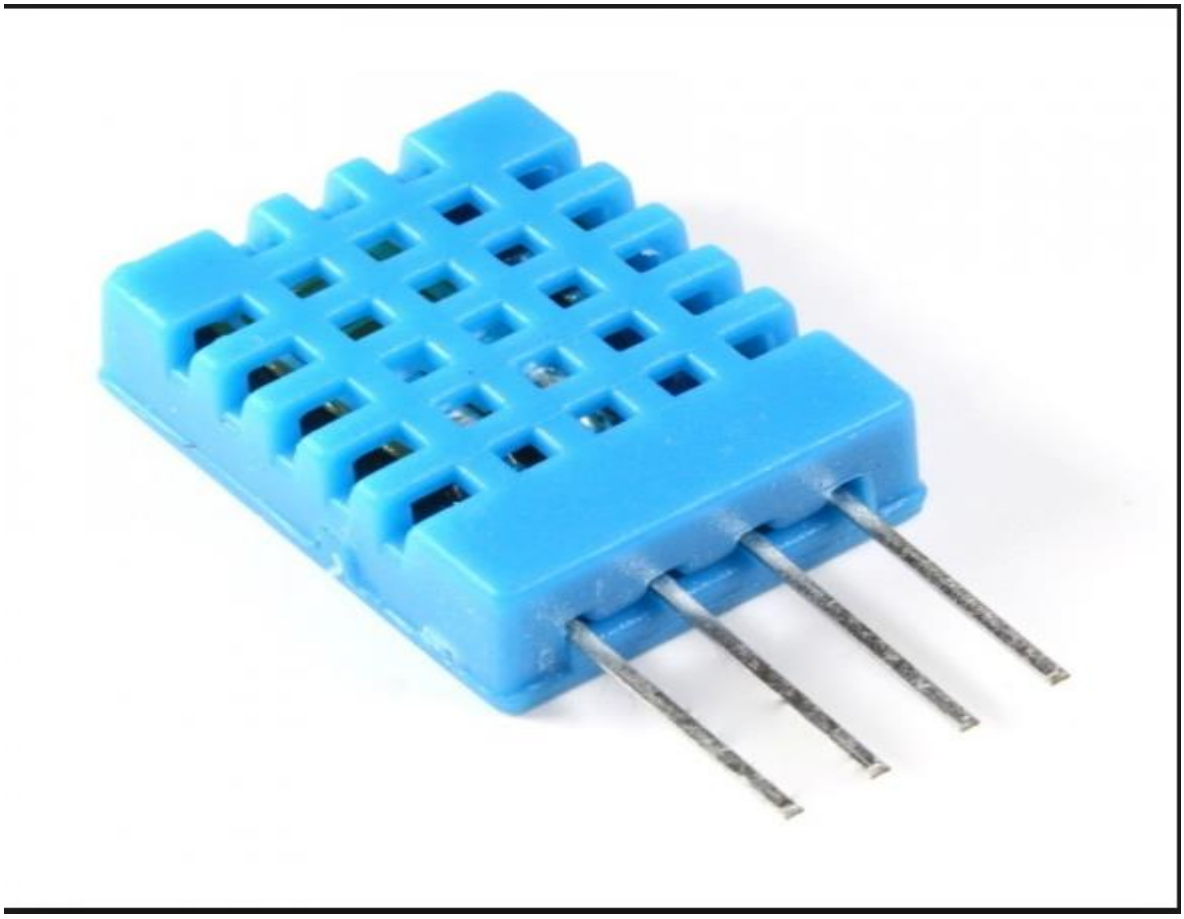
Credits

Friend
Name: Manish Paikara

Sensor used

DHT11

Picture:



Code:

```
#define DHTTYPE DHT11
#define dht_dpin D0
#include <FirebaseArduino.h>
#include  <ESP8266WiFi.h>

#define FIREBASE_HOST "nodeio-21141.firebaseio.com"
#define WIFI_SSID "honor"
#define WIFI_PASSWORD "11229693"
#define FIREBASE_AUTH "dFsOJuPUUNTZlrctrBX6YjVy262ZdsnuGaVwXZzw"
DHT dht(dht_dpin,DHTTYPE);

void setup() {

   Serial.begin(9600);
   WiFi.begin (WIFI_SSID, WIFI_PASSWORD);
   while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }

   dht.begin();
  Serial.println ("");
  Serial.println ("WiFi Connected!");
  Firebase.begin(FIREBASE_HOST);

}

void loop() {

  float h = dht.readHumidity();
  float t = dht.readTemperature();
  Firebase.setFloat ("Temp",t);
  Firebase.setFloat ("Humid",h);
  delay(200);
}
```

Pin diagram

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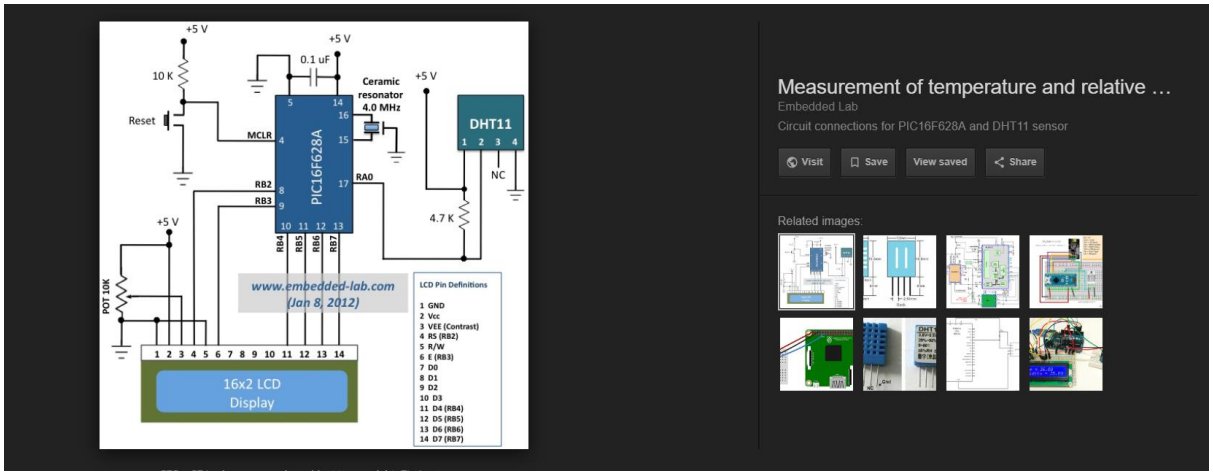
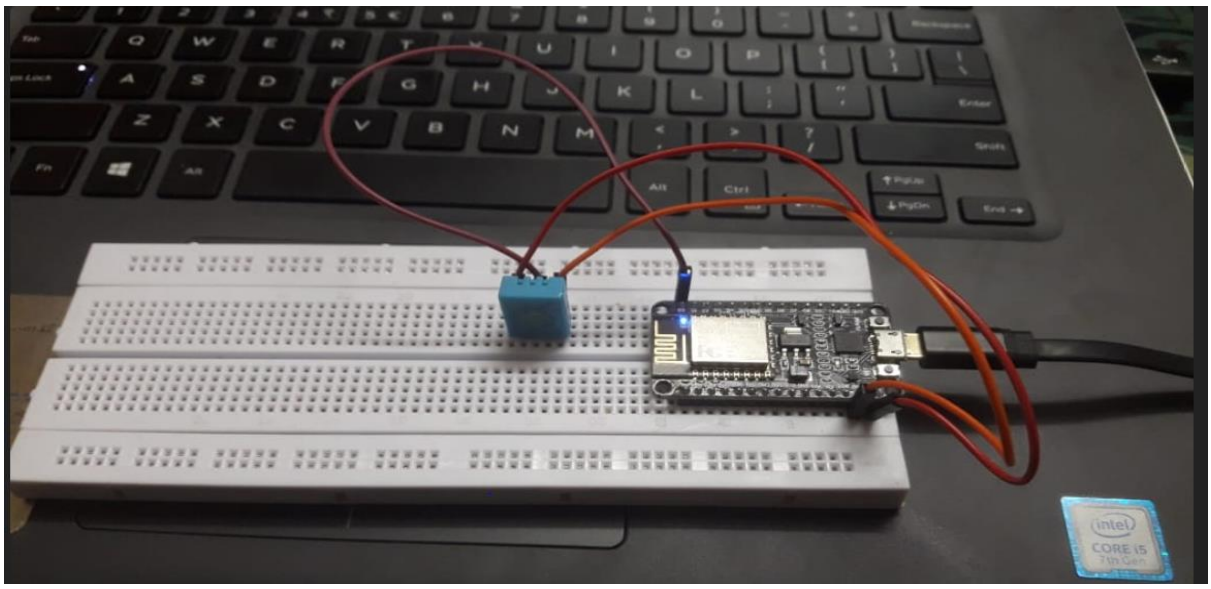
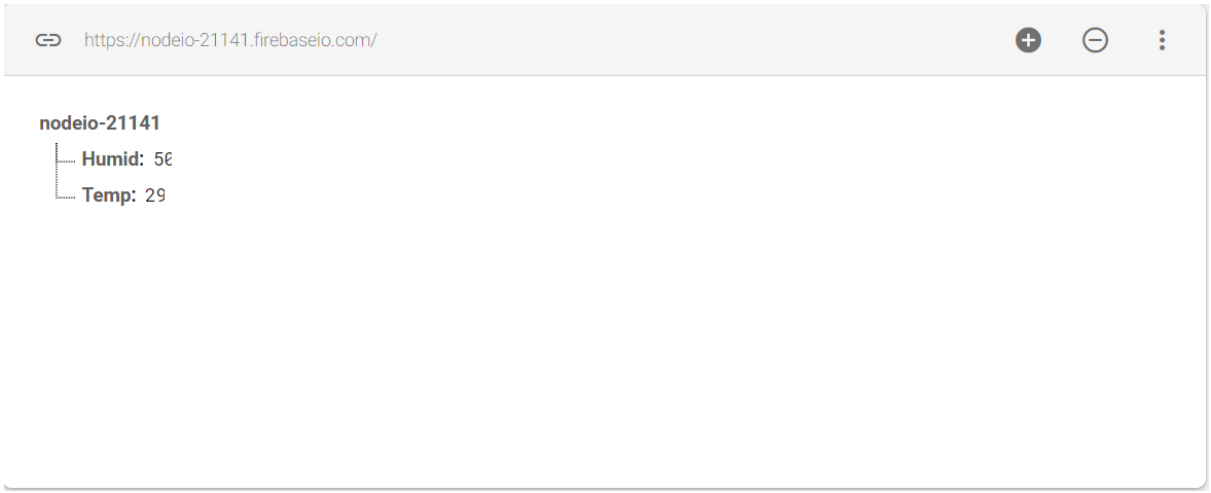


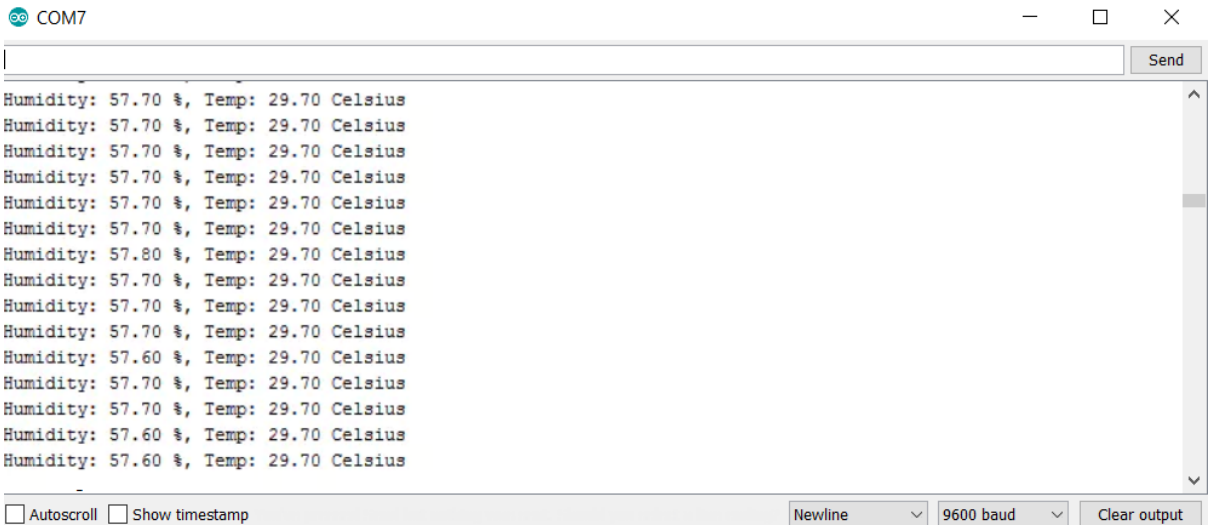
PROJECT PICTURE



FIREBASE OUTPUT



SERIAL MONITOR OUTPUT



5. Result

IOT-Based temperature and humidity calculating system provides an efficient and safe system for detecting agricultural parameters. The results of temperature and humidity can be seen on firebase.

6.Conclusion

IOT-Based temperature and humidity detecting system provide an efficient and definitive system for monitoring agricultural parameters. The corrective action can be taken. IOT-Based monitoring of field not only allows user to reduce the human work and time, but it also permits user to analyze accurate changes in the atmosphere and for taking possible action. It is cheaper in cost and consumes less power. The GDP per capita in agro sector can be increased. This IOT-based system can be extended for controlling different electronic and electrical apparatus from remote locations and the system can also extended for soil moisture and cattle monitoring.

7. Reference

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