WEATHER MONITORING SYSTEM

**A PROJECT REPORT**

**Submitted by**

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**ABSTRACT**

**The system proposed is an advanced solution for monitoring the weather conditions at a particular place and make the information visible anywhere in the world. The technology behind this is Internet of Things (IoT), which is an advanced and efficient solution for connecting the things to the internet and to connect the entire world of things in a network. Raspberry Pi, sensors and automotive electronic equipment. The system deals with monitoring and controlling the environmental conditions like temperature, relative humidity and CO level with sensors and sends the information to the web page and then plot the sensor data as graphical statistics. The data updated from the implemented system can be accessible in the internet from anywhere in the world.**

**INTRODUCTION**

**PROBLEM DEFINITION**

Weather monitoring system being very hand for better performance of the solar plants has the issue of higher cost. The hard drive based data logging facility requires a separate computer setup for its operation and many a times, the data stored cannot be manipulated in a useful mean. These two problems are the primary concerns when you consider a weather monitoring system and we have come up with cost effective innovative solution to provide the layman’s weather monitoring system.

**Working and ThingSpeak Setup:**

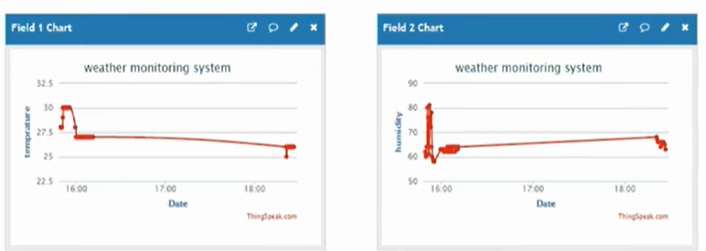
This IoT based project has four sections. Firstly DHT11 sensor senses the Humidity & Temperature Data and BM180 sensor measures the atmospheric pressure. Secondly Raspberry Pi reads the DHT11 sensor module’s output by using single wire protocol and BM180 pressure sensor’s output by using I2C protocol and extracts both sensors values into a suitable number in percentage (humidity), Celsius scale (temperature), hectoPascal or millibar (pressure). Thirdly, these values are sent to ThingSpeak server by using inbuilt Wi-Fi of Raspberry Pi 3. And finally ThingSpeak analyses the data and shows it in a Graph form. A LCD is also used to display these values locally.

Now we need this ‘Feed Get Request URL’ in our Python code to open “api.thingspeak.com” and then send data using this Feed Request as query string. And Before sending data user needs to enter the temperature, humidity and pressure data in this query String using variables in program.

URL = 'https://api.thingspeak.com/update?api\_key=%s' % key

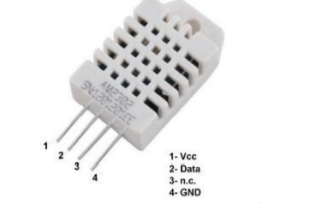
finalURL = URL +"&field1=%s&field2=%s"%(humi, temp)+"&field3=%s" %(pressure)

Working of DHT11 is based on single wire serial communication for fetching data from DHT11. Here we have used AdaFruit DHT11 library for interfacing DHT11 with Raspberry Pi. Raspberry Pi here collects the Humidity and temperature data from DHT11 and atmospheric pressure from BMP180 sensor and then sends it to 16x2 LCD and ThingSpeak server.



**DHT-22 Temperature & Humidity Sensor**:

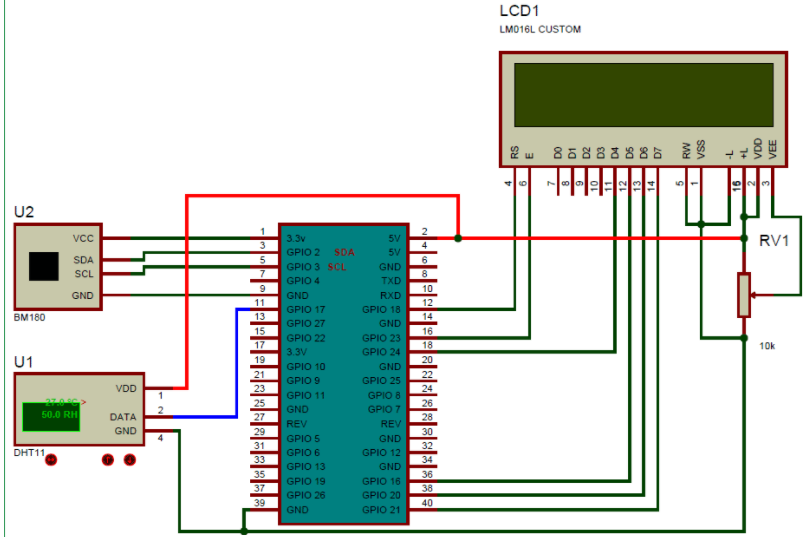
The DHT-22 is a 4 pin compact temperature and humidity sensor by Adafruit with a prebuilt DHT library for Arduino and Raspberry Pi. The Analog sensor has resolution of two decimal points and accuracy of ±0.5˚C. The DHT22 sensor can work under extreme temperatures between -40˚C to 80˚C.



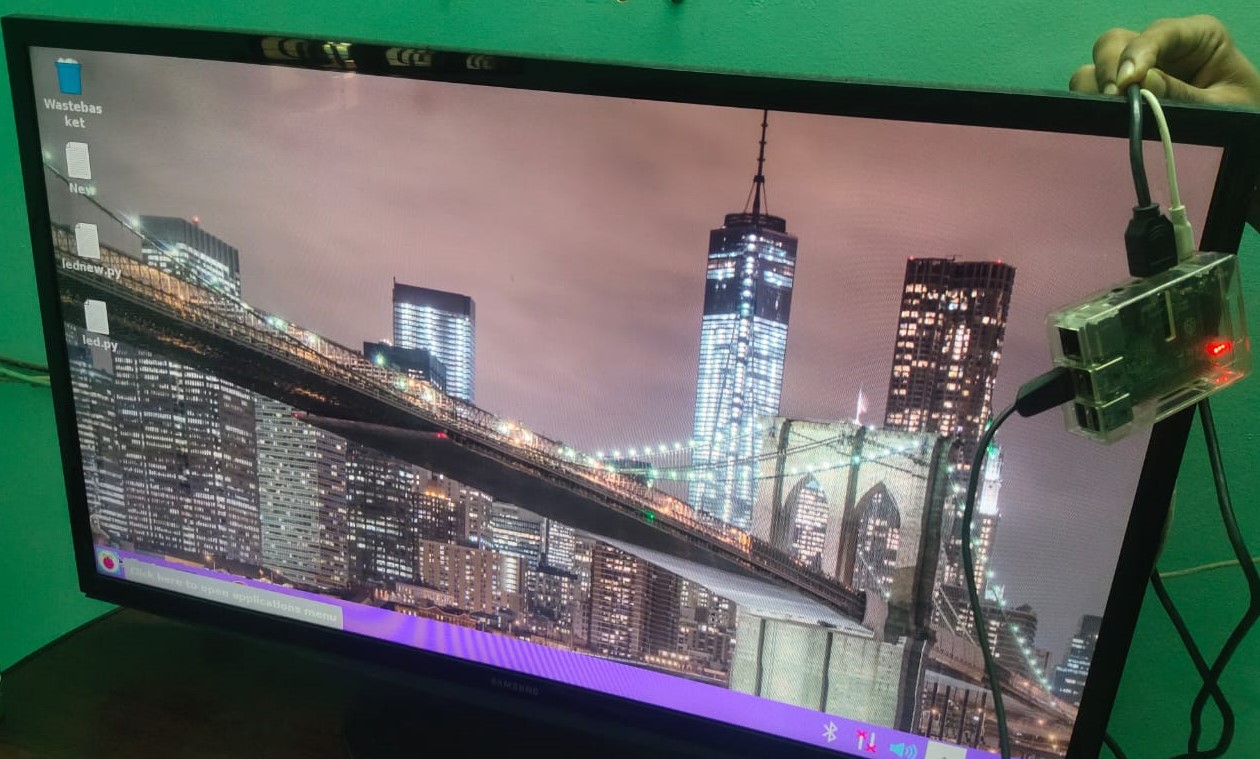
**BMP180 sensor** senses that pressure and provides that information in digital output. Also the temperature affects the pressure and so we need temperature compensated pressure reading. To compensate, the BM180 also has good temperature sensor. They are all designed to measure Barometric Pressure or Atmospheric pressure. BMP180 is a high precision sensor designed for consumer applications. Barometric Pressure is nothing but weight of air applied on everything. The air has weight and wherever there is air its pressure is felt.

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### Circuit Diagram:

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**RASPBERRY PI 2 OS(RASPIAN JESSI)DEMO IMAGE:**

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