Shri G.S. Institute of Technology & Science, Indore

Department of Computer Science & Engineering

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A Project Report on

"Humidity Monitoring System "

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We would like to express gratitude to our staff members for their support too.

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1.INTRODUCTION

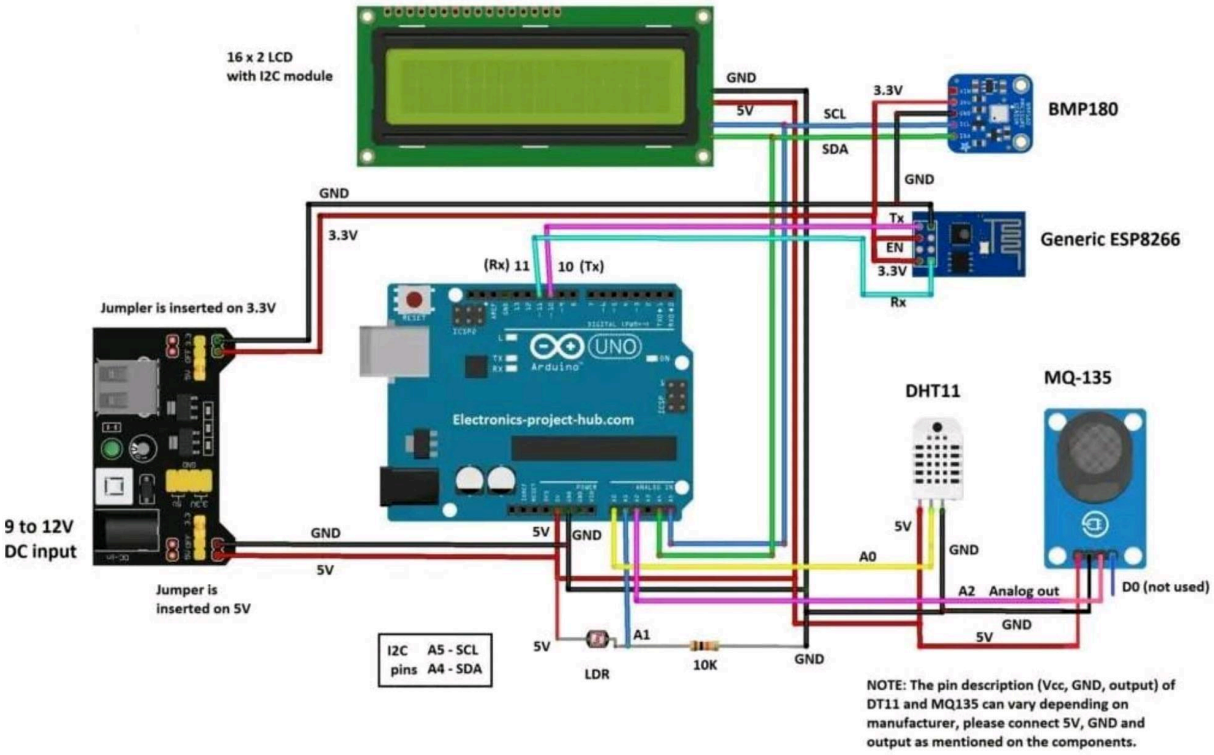
Here we propose a smart humidity monitoring system over the internet. Our proposed system allows for humidity parameter reporting over the internet. It allows the people to directly check the humidity stats online without the need of a humidity forecasting agency. System uses temperature, humidity as well as rain sensor to monitor humidity and provide live reporting of the humidity statistics. The system constantly monitors temperature using temperature sensor, humidity using humidity sensor and also for rain. The system constantly transmits this data to the microcontroller, which now processes this data and keeps on transmitting it to the online web server over a wifi connection. This data is live updated to be viewed on the online server system. Also system allows user to set alerts for particular instances, the system provides alerts to user if the humidity parameters cross those values. Thus the IOT based humidity reporting system provides an efficient internet based humidity reporting system for users.

2.WORKING PRINCIPAL

We are going to develop the humidity monitoring system using the above illustrated blocks. The brain of the project is an Arduino board and the surrounding blocks are digital and analog sensors for acquiring local humidity and environment data.

A generic ESP8266 is used for interfacing the circuit setup with internet via 2.4 GHz Wi-Fi band. The ESP8266 sends the sensor data to a cloud server where the data gets updated in real time and also gets stored for future analysis. We are utilizing a 16 x 2 LCD display to showcase the sensor data, so that we can observe real-time data locally.

3. CIRCUIT DIAGRAM



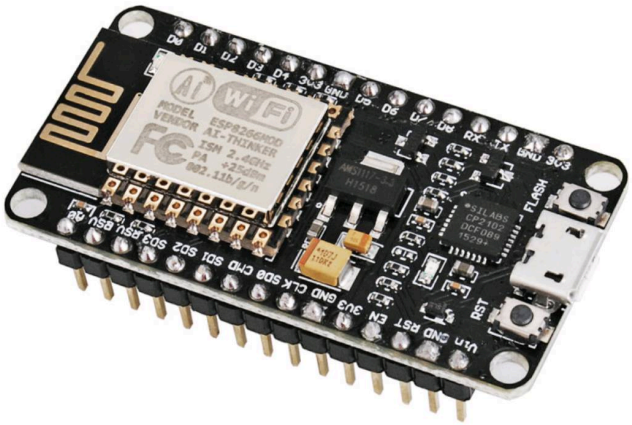
4. COMPONENT USED

	Name of component	Specification	Quantity	Cost per piece (in Rs)
1.	Power supply	5V/3.3V	1	72/-
2.	16X2 LCD display	4.7V to 5.3V	1	119/-
3.	DHT11 Sensor	3.5V to 5.5V	1	76/-
4.	Breadboard		3	59/-
5.	Jumper Wire			39/-
6.	BMP180 Sensor	1.3V – 3.6V	1	39/-
7.	MQ-135	DC 5 V	1	103/-
8.	Generic ESP8266 module	Processor: L106 32-bit RISC microprocessor core	1	210/-
9.	LDR		1	28/-
10.	Arduino Uno		1	360/-
	Total Price		11	760/-

5.COMPONENT DETAILS

1) Generic ESP8266 Wi-Fi module.

ESP8266 is an open source IoT platform. It includes firmware which runs on the low cost Wi-Fi enabled ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. It has GPIO, SPI, I2C, ADC, PWM AND UART pins for communication and controlling other peripherals attached to it. On board NodeMCU has CP2102 IC which provides USB to TTL functionality.



2) BMP180 Sensor

The BMP180 measures both pressure and temperature, because temperature changes the density of gasses like air. At higher temperatures, air is not as dense and heavy, so it applies less pressure on the sensor. At

lower temperatures, air is more dense and weighs more, so it exerts more pressure on the sensor. The sensor uses real-time temperature measurements to compensate the pressure readings for changes in air density

3)**16X2 LCD display** -

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

4) **BREADBOARD-** A breadboard is a rectangular plastic board with a bunch of tiny holes in it. These holes let you easily insert electronic components to prototype (meaning to build and test an early version of) an electronic circuit, like this one with a battery, switch, resistor, and an LED (light-emitting diode.

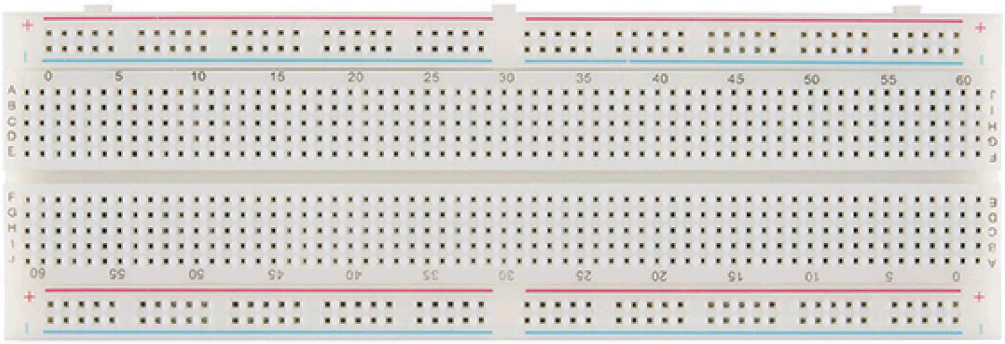


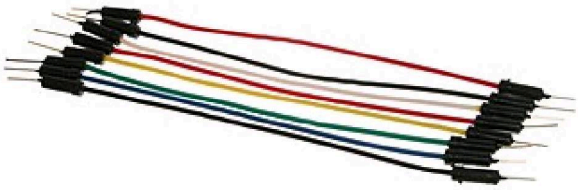
Fig : BREADBOARD

6) DHT11

The DHT11 is a basic, ultra low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). Its fairly simple to use, but requires careful timing to grab data. The only real downside of this sensor is you can only get new data from it once every 2 seconds, so when using our library, sensor readings can be up to 2 seconds old.

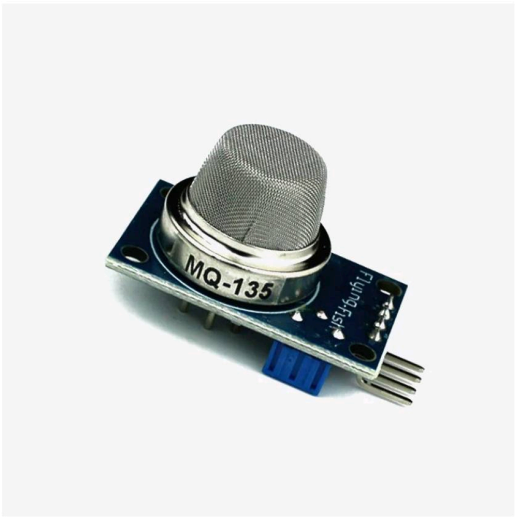
7) Jumper Wire

A jump wire (also known as jumper, jumper wire, DuPont wire) is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.[



8. MQ-135 Gas sensor

The MQ-135 Gas sensor can detect gases like Ammonia (NH3), sulfur (S), Benzene (C6H6), CO2, and other harmful gases and smoke. Similar to other MQ series gas sensor, this sensor also has a digital and analog output pin. When the level of these gases go beyond a threshold limit in the air the digital pin goes high. This threshold value can be set by using the on-board potentiometer. The analog output pin, outputs an analog voltage which can be used to approximate the level of these gases in the atmosphere.



9.Conclusion

In conclusion, a weather monitoring system is an essential tool that provides real-time and accurate weather data. It helps to prevent weather-related disasters and supports decision-making in various industries. The system comprises various sensors that collect weather data, which is then processed and analyzed by computer software. The data can be presented in graphical or tabular form, and alerts can be generated to warn of severe weather conditions. Weather monitoring systems are continuously evolving, and with the advent of advanced technologies such as artificial intelligence and machine learning, they are becoming more efficient and effective. Overall, a weather monitoring system is a critical component in ensuring the safety and well-being of people and businesses in areas affected by weather conditions.

10.Bibliography

Sites that we referred to :

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