VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI-590018, KARNATAKA

MINI PROJECT REPORT
ON

"Rain Detector Sensor"

Submitted by

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

This is to certify the Mini Project Report entitled "**Rain Detector Sensor**", prepared by **Mr. Adithya C**, bearing **USN 1CR21EC260**, a bona fide student of **CMR Institute of Technology, Bengaluru** in partial fulfillment of the requirements for the award of **Bachelor of Engineering in Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi-590018** during the academic year 2022-23.

This is certified that all the corrections and suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project has been approved as it satisfies the academic requirements prescribed for the said degree.

Signature of Guide
Prof. P Velrajkumar
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Signature of HOD
Dr. R Elumalai
Professor & HoD

DECLARATION

We, [Mr.Chitambar **(1CR21EE020),** Mr.Adithya **(1CR21EC260),** Mr.Abhilash **(1CR21EE002)],** hereby declare that the report entitled **"RAIN DETECTOR SENSOR"** has been carried out by us under the guidance of **Mr. P Velrajkumar,** Associate Professor, Department of Electrical & Electronics Engineering, CMR Institute of Technology, Bengaluru, in partial fulfillment of the requirement for the degree of **BACHELOR**

OF ENGINEERING in ELECTRICAL & ELECTRONICS

ENGINEERING, of Visveswaraya Technological University, Belagaum during the academic year 2020-21. The work done in this report is original and it has not been submitted for any other degree in any university.

Place: Bengaluru

Date: 07.03.2023

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ACKNOWLEDGEMENT

ABSTRACT

We all hang clothes to dry in the balcony and in the terraces. Rainwater alarm system is a simple but very useful project which detects the rain and automatically triggers the alarm or piezo buzzer or even lights up an indicator. The sensor acts as a simple switch closes when it rains and is normally open when the rain stops. This product can also be used in the wipers of cars and other panels as such using the concept of rainwater detector system. The wiper can start cleaning once the detector system detects rain on the windshield and sends a signal to the wiper.

Hence this way we can even program the wiper to wipe water automatically when it rains on a car/ vehicle windshield. In all these ways we can use this concept for scientific purposes and to make products useful as these.

Contents

LIST OF FIGURES

INTRODUCTION

WHAT IS RAIN SENSOR?
A sensor that is used to notice the water drops or rainfall is known as a rain sensor. This kind of sensor works like a switch. This sensor includes two parts like sensing pad and a sensor module. Whenever rain falls on the surface of a sensing pad then the sensor module reads the data from the sensor pad to process and convert it into an analog or digital output. So the output generated by this sensor is analog (AO) and digital (DO).

THE SENSOR PAD

It is made up of exposed copper particles on both sides. It acts as a variable resistor. This resistance value varies according to the amount of water falling on it. That resistance value is inversely proportional to the amount of water good conductivity occurs when more water flows over the sensor surface when there is less resistance also, when a small amount of water flows over this surface, it has poor conductivity, thereby increasing the resistance because of this concept, we can get an output voltage through this.
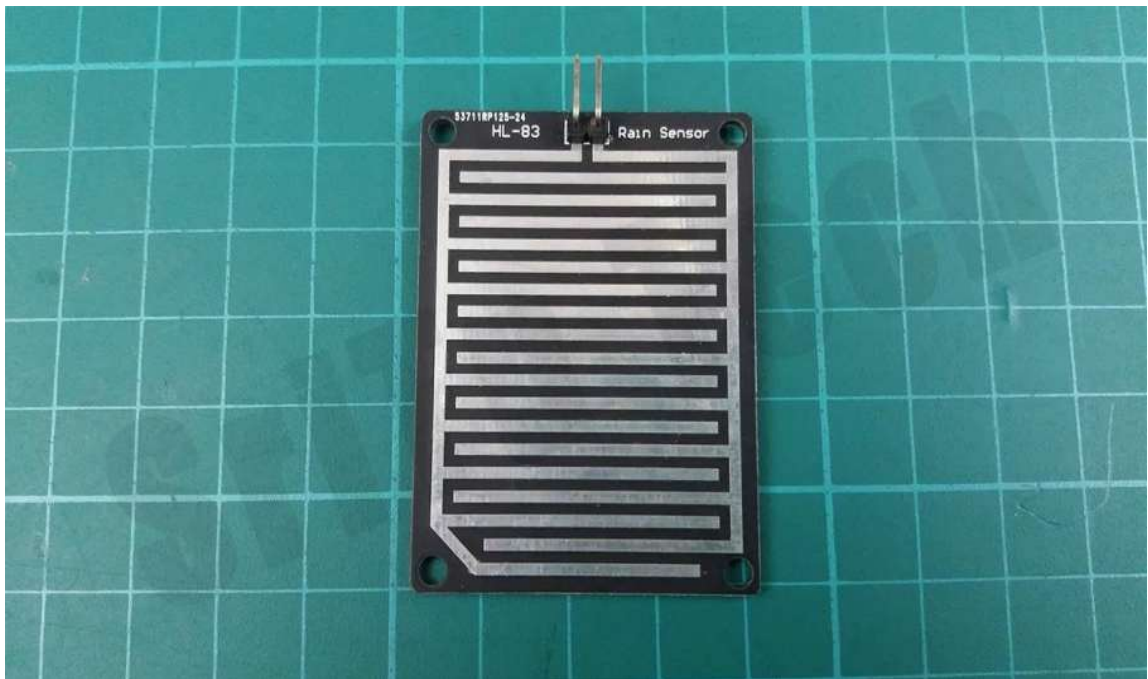
THE MODULE

The rain sensor module is an easy tool for rain detection. It can be used as a switch
When raindrop falls through the raining board and also for measuring rainfall
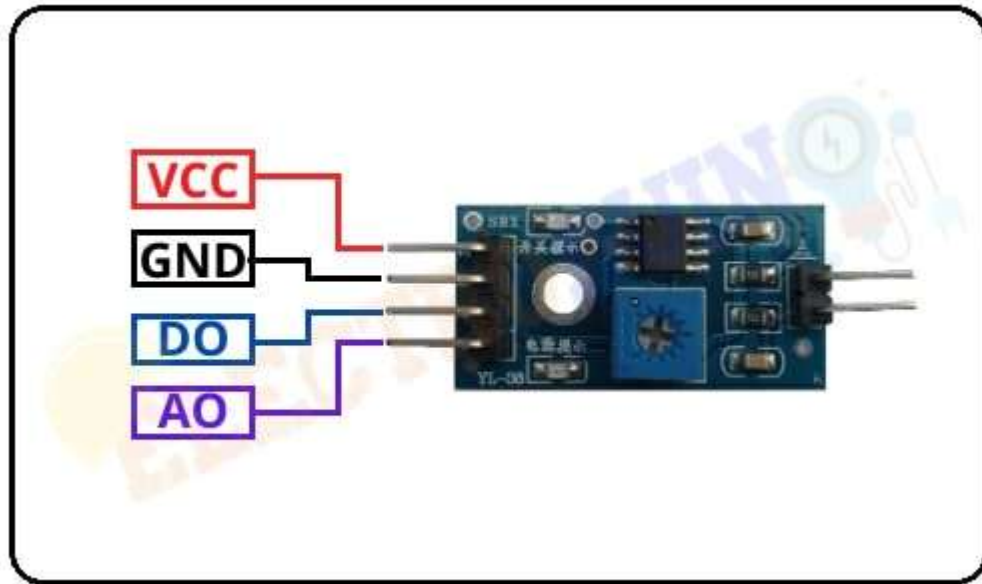
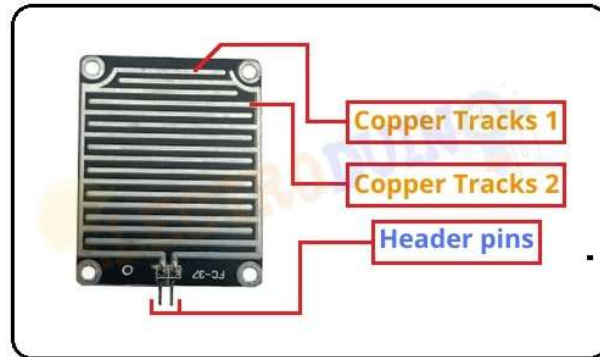intensity.

| 1	VCC	+5 v power supply
2	GND	Ground (-) power supply
3	DO	Digital Output (0 or 1)
4	AO	Analog Output (range 0 to 1023)

Sensing Pad   Sensor Module

The Rain Sensor Module's Sensing Pad consists of two nickel-coated series copper tracks. Also, it has **two Header pins**, these are internally connected to the two copper tracks of the Sensing Pad. These pins are used to connect the Sensing Pad to the rain sensor module circuit through two jumper wire. Always, one pin of the rain sensor circuit provides a +5v power supply to the one track of the sensing pad, and another pin is received the return power supply from another track of the sensing pad.

Normally under dry conditions, the sensing pad provides high resistance and low conductive. So, the 5v power supply cannot be passed from one track to another track. Its resistance varies according to the amount of water on the surface of the sensing pad. When water drops fall on the sensor pad surface its resistance will decrease and conductivity will increase. So, when water drops increase on the pad surface it can pass more power supply through one track to another track.
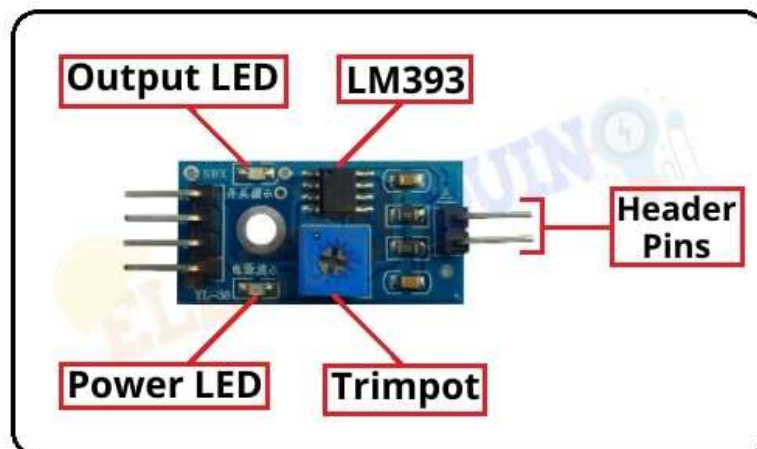
Also the LM393 High Precision Comparator here changes the sensitivity of the digital value with the potentiometer here.
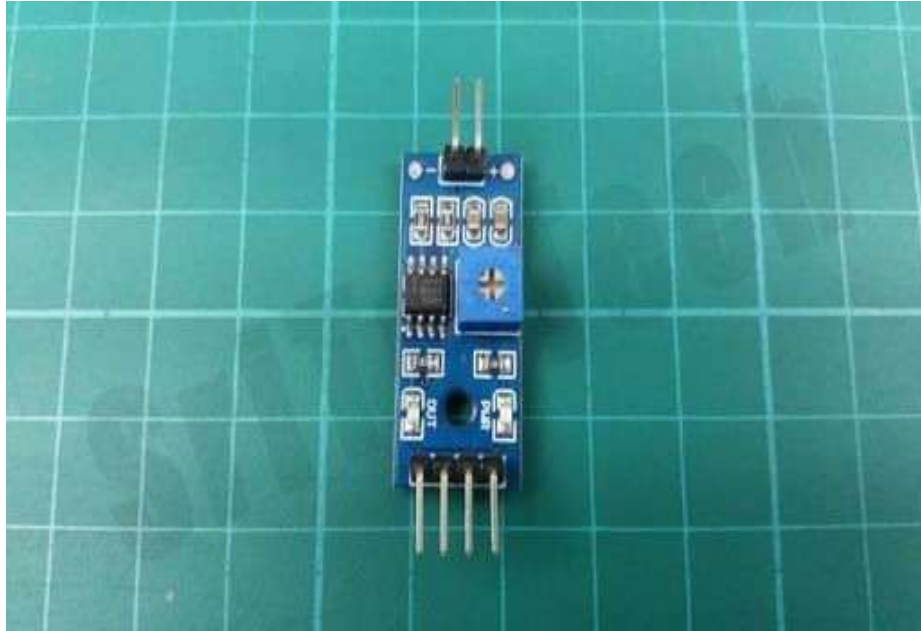
In this module, you can see 6 pins. Sensor pads+and- should be connected with the two pins marked above. The other four pins are described below.

VCC- This pin must have a potential between 3.3V-5V.

GND-This should attach to the cathode terminal.

AO-This pin can be used to get the rainfall value as an analog value.

D0-This pin can be used as a digital value for rainfall.

Okay, now the required components are:

Arduino uno body-1

Rain sensor-1

Led bulb-1

Jumper wires- as many as req

STEP_1
Let's identify the components-
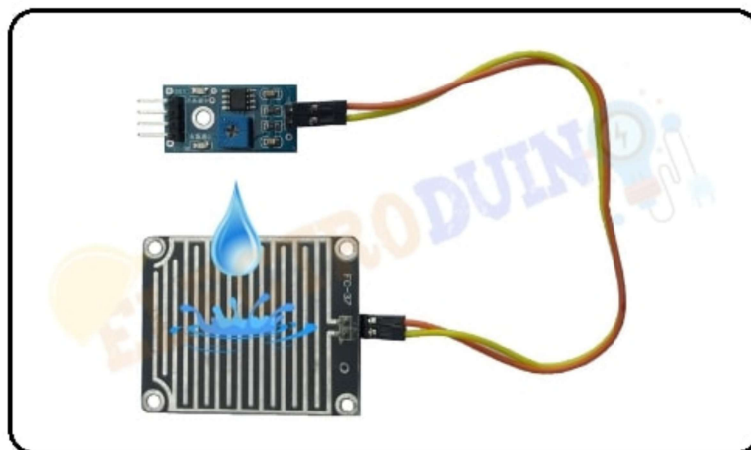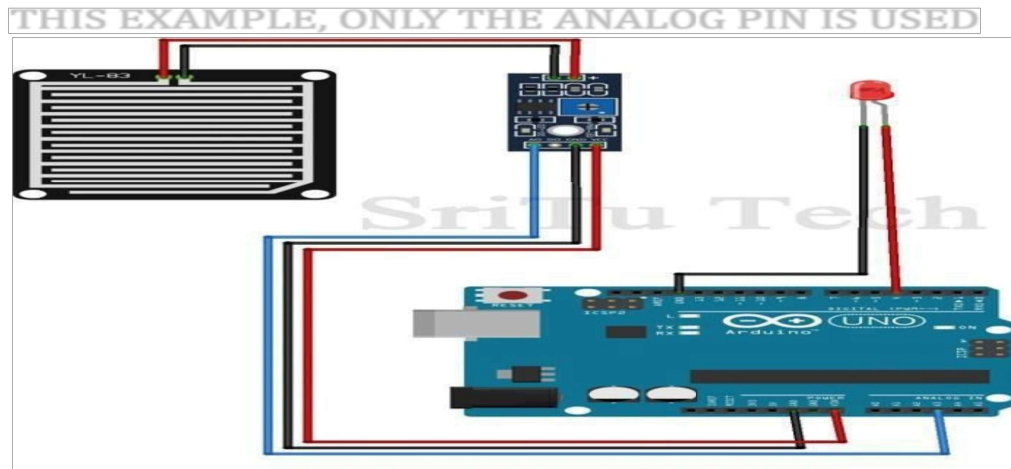
Arduino Uno board

Rain sensor

LED BULB

JUMPER WIRES

JUMPER WIRES

STEP_2

On connecting all the above mentioned components, using the circuit diagram below. In this example, only the analog pin is used

STEP_3

Then we will create the required program for this. We can see it below. With this program, we can see the rainfall value in the serial monitor. We can get it as an analog value. If the analog value is high we can identify it as a low rainfall and if the analog value is low we can know it is high rainfall. According to the program, if analog value is less than 300, the led bulb will turn on.

```
/*How to use rain sensor. void setup()
{ Serial.begin(9600);//enable serial monitor
pinMode(4, OUTPUT);//define LED pin
}
void loop() {
int value = analogRead(A3);//read value
Serial.print("Value : ");
Serial.println(value);
if (value < 300) {//check condition
digitalWrite(4, HIGH);
Serial.print("Heavy rain  LED on
"); } else {
digitalWrite(4, LOW); }
}
```

Code explanation:
First, the serial monitor of the VOID SETUP is enabled. Also, the PIN connected to the LED bulb is converted to an OUTPUT PIN.
void setup() { Serial.begin(9600);//enable serial monitor pinMode(4, OUTPUT);//define LED pin

}
Next, we get the Sensor analog value in the VOID LOOP and put it in an Integer type variable. It is named as "value" and then the value is printed on the Serial monitor.

```
int value = analogRead(A3);//read value Serial.print("Value : ");
Serial.println(value);
```

Finally, the value is checked by an IF condition and if it is less than 300,the LED bulb is turned ON and the "Heavy rain LED on" is printed on
the serial monitor. Otherwise, the code is designed to turn OFF the LED bulb.

```
if (value < 300) {//check condition digitalWrite(4,
HIGH); Serial.print("Heavy rain LED on ");
} else {
digitalWrite(4, LOW);
}
```

Rain Alarm Project is a simple but very useful project that detects Rain (Rain Water) and automatically triggers an alarm or buzzer.
Water is a basic need in every one's life. Saving water and proper usage of water is very important. Here is an easy project which will give the alarm when there is rain, so that we can make some actions for rain water harvesting and also save the rain water for using it later.

With the help of saving this rain water through rain water harvesting, we can increase the levels of underground water by using underwater recharge technique.
Rain water detector will detect the rain and make an alert; rain water detector is used in the irrigation field, home automation, communication, automobiles etc. Here is the simple and reliable circuit of rain water detector which can be constructed at low cost.

APPLICATIONS:

Rain Alarm Project Circuit Applications:
•In the irrigation, it will detect the rain and immediately alert the farmer.
•In automobiles, when the rain detector detects the rain it will immediately active the wipers and inform the driver.
•In communications, it will boost the power of the antenna and increase the signal strength to send or receive the signals.
•In normal house hold, with the help of rain water detector we can automatically save the rain water. (This can be done only when home automation is done and there is proper equipment to save the rain water. In this, rain water detector will detect the rain and helps to switch ON the equipment which will automatically save rain water for different purposes).
•This can also be used if there is a chemical rain also. This is very common in industrial areas.

CONCLUSION

The entitle of this project is essential for fertilizers and cottage industries. The main purpose of the project is to avoid mental stress and to prevent material deterioration from rain. This is the project that can be easily constructed using simple electronic components.

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