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Weather Monitoring System

Pratham Bharat Gaikwad, Onkar Rahul Kamble

Department of Computer Engineering, Marathwada Mitra Mandal Polytechnic, Pune, India

Department of Computer Engineering, Marathwada Mitra Mandal Polytechnic, Pune, India

ABSTRACT: In order to gather and analyse weather-related data in real-time, a weather monitoring system is a collection of hardware, equipment, and software tools. Sensors for detecting temperature, humidity, wind direction and speed, air pressure, and precipitation are generally part of these systems. Advanced algorithms and predictive models are used to process and analyse the acquired data in order to produce precise weather forecasts, alerts, and warnings.A wide range of applications, including aviation, transportation, agriculture, and emergency management, depend heavily on the weather monitoring system. These systems support decision-makers in making educated decisions, maximising resource use, and mitigating risks related to extreme weather events by providing accurate and timely meteorological information.

All things considered, weather monitoring systems are crucial tools for guaranteeing public safety, boosting economic output, and safeguarding the environment.

I. INTRODUCTION

IoT can transport temperature, humidity, and moisture measurements to the cloud for analysis. NodeMCU is the platform for the Internet of Things. Thing talk serves as the cloud server's platform. Giving the user ongoing plant monitoring is the main objective. The recommended smart plant management can be utilised to keep an eye on both domestic and small-scale agricultural plants. Commercial farming can benefit from using sophisticated sensors, and this model can be fortified to be more durable. Using this intelligent plant management system that uses IoT, the user will be able to continuously monitor the plant. The user can use the Blynk smartphone to activate the irrigation motor after receiving a notification anytime the soil moisture level falls below a certain threshold. Temperature, humidity, and moisture information can be sent via IoT to the cloud for analysis. The platform for the Internet of Things is NodeMCU. The cloud server's operating system is Thing Talk. The major goal is to provide the user with constant plant monitoring. Both home and small-scale agricultural plants can be monitored using the suggested smart plant management. The use of sophisticated sensors in commercial farming is advantageous, and this model can be strengthened to be more resilient. The user would be able to continuously monitor the plant using this IoT-based intelligent plant management system. Anytime the soil moisture level drops below a predetermined level, the user will receive a notification on their Blynk smartphone, which they can use to engage the irrigation motor.

II. FUNDAMENTALS AND BASICS

A.Digital Humidity and Temperature sensor

A DHT11 sensor is used to measure the temperature and relative humidity of the air. Its main advantage is that it is a low-cost digital sensor for monitoring temperature and relative humidity [5]. The relative humidity varies with temperature. When it is warmer outdoors than it is inside, the air is more humid, and vice versa. All microcontrollers, such as Arduino, NodeMCU, and others, are easily interfaced with. It has a capacitive sensing device for detecting humidity and a thermistor for determining temperature. The capacitance is made up of two electrodes. The moisture-controlling substrate acts as a dielectric between them. A change in capacitance will occur as the humidity changes. Based on the accompanying changes in resistance, a negative temperature coefficient thermometer can calculate the temperature.is capable of being converted to digital form. As the temperature rises, the resistance will decrease. Temperatures range from 0 to 50 Celsius. The humidity fluctuation for this sensor is between 20 and 80%.

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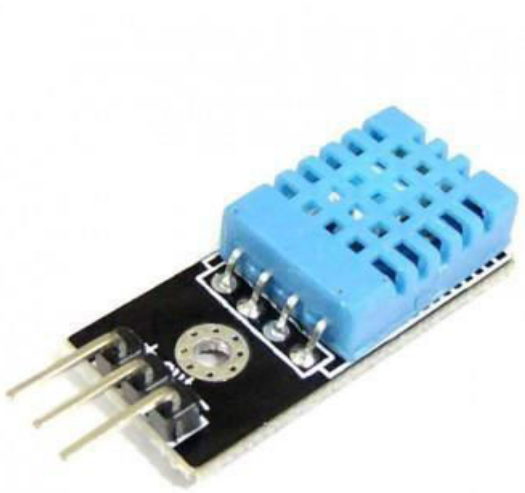
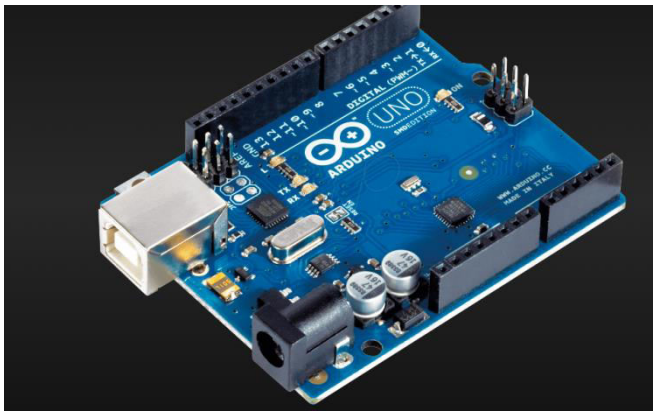


B.ARDUINO UNO

The Arduino Uno is an open-source microcontroller board created by Arduino.cc and first made available in 2010. It is based on the Microchip ATmega328P microprocessor.[2][3] Sets of digital and analogue input/output (I/O) pins are included on the board, allowing it to be interfaced with other expansion boards (shields) and other circuits.[1] The board contains 6 analogue I/O pins and 14 digital I/O pins, six of which can be used for PWM output. It can be programmed using the Arduino IDE (Integrated Development Environment) with a type B USB connector.[4] A barrel connector that can handle voltages between 7 and 20 volts, such as a square 9-volt battery, or a USB cable are both options for powering it. It resembles the Arduino Nano and Leonardo in certain ways.[5][6] A Creative Commons licence is used to distribute the hardware reference design.



C.LCD DISPLAY :

A flat-panel display or other electronically controlled optical device that makes use of polarizers and the light-modulating capabilities of liquid crystals is known as a liquid-crystal display (LCD). Liquid crystals don't directly emit light[1], instead creating colour or monochromatic pictures with a backlight or reflector.[2] There are LCDs that can show random images (like on a general-purpose computer display) or fixed displays with little information that can be seen or hidden. Examples of gadgets using these displays include preset words, figures, and seven-segment displays,

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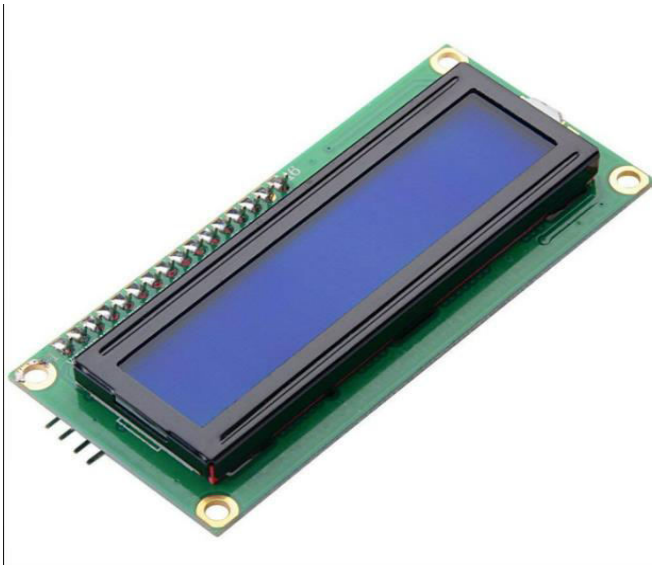
such as those seen in digital clocks. They both make use of the same fundamental technology, although some displays have larger components, whereas others employ a grid of tiny pixels to create random images. LCDs can be turned on regularly (positively) or off.



D. 2 CHANNELRELAY :

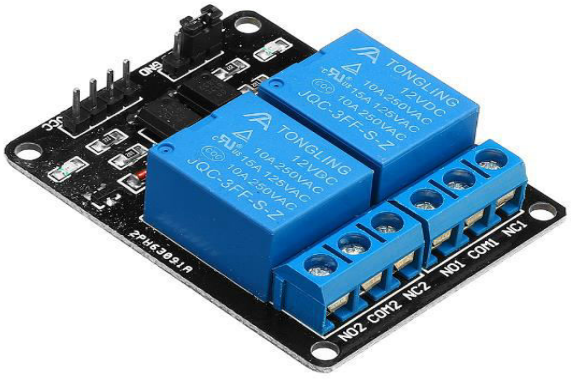
Each channel on this LOW Level 5V 2-channel relay interface board requires a 15-20mA driver current. It can be used to operate a variety of high-current devices and appliances. It has high-current relays that operate at either AC250V or DC30V 10A. It features a common interface that a microcontroller may directly control.

Maximum output of the relay: DC 30V/10A and AC 250V/10A

Relay Module with 2 Channels and Optocoupler The expansion board for the Arduino compatible LOW Level Triger

Standard interfaces that microcontrollers (8051, AVR, *PIC, DSP, ARM, ARM, MSP430, TTL logic) can directly control

Relay much excellent free music uses SPDT. Additionally, a common terminal, one generally closed terminal, one normally open terminal, a good anti-jamming VCC, and RY-VCCthe relay module's power source. You can remove the jumper cap and connect an additional power source to RY-VCC when you need to supply a lot of power to a load.



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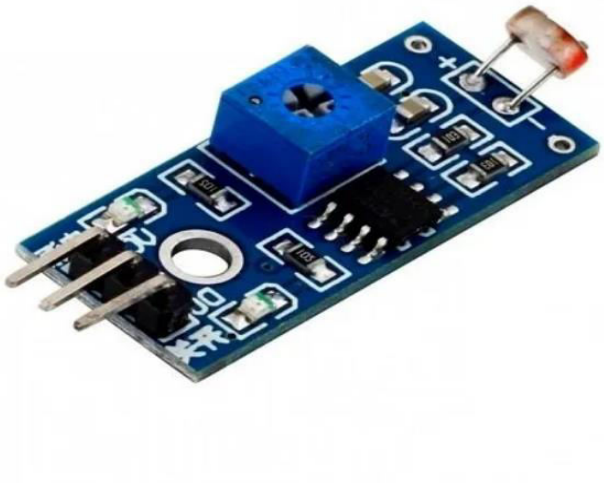
E.LDR(LIGHT DEPENDANT RESISTORS):

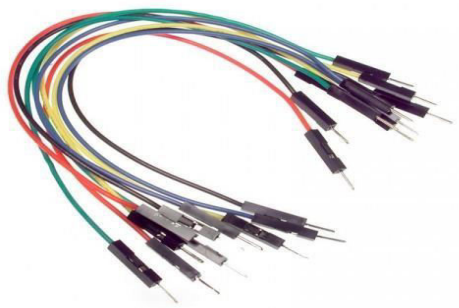
Photodetectors, also called photosensors, are sensors of light or other electromagnetic radiation.[1] There is a wide variety of photodetectors which may be classified by mechanism of detection, such as photoelectric or photochemical effects, or by various performance metrics, such as spectral response. Semiconductor-based photodetectors typically photo detector have a p–n junction that converts light photons into current. The absorbed photons make electron–hole pairs in the depletion region. Photodiodes and photo transistors are a few examples of photo detectors. Solar cells convert some of the light energy absorbed into electrical energy.



F.Relay NodeMCU

Relay is needed to regulate 230v AC and current of 10A because NodeMCU, which is operated at 5v, is unable to control higher voltage devices directly. Relay jqc3f-05vdc-cIt was used to control the circuit. Relays are switches that are used to turn circuits on and off. Where a few circuits are restricted by a single signal, it is frequently utilised. It uses a low power signal to control high power circuits. It consists of signal (S), negative (-), and positive (+) low voltage pins. '+', '-' are connected to the microcontroller's VCC and GND, respectively, while S is connected to one of the Node MCU's inputs to turn on the relay. It has three terminals that are utilised to link the external circuit (NC, NO, and C). Both normally closed (NC) and normally open (NO) are controlled by the same terminal, C. The external circuit is connected to the normally closed and common terminals when the relay is disengaged. The external circuit and the common terminal are connected when the relay is turned on.

G.Jumper Wires



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Jumper wires are used to connect components on your breadboard to the header pins on your Arduino. Wire up all of your circuits with these. Simply said, jumper wires are wires with connector pins at either end that can be used to connect two places without soldering. With breadboards and other prototype tools, jumper wires are frequently used to make it simple to change a circuit as required. Fairly easy. Jumper wires are actually among the most elementary things there are. Male-to-male, male-to-female, and female-to-female jumper wires are the most common types. The wire's termination tip distinguishes each one from the other. While female ends do not have a protruding pin and are used to plug into items, male ends do. The most typical and frequently utilised jumper wires are male to male. A male-to-male wire is required to connect two ports on a breadboard.

III. ACKNOWLEGEMENT

We have taken efforts in this project. However, it would not have been possible without the kind support and help of my group members and my teachers. I would like to extend my sincere thanks to all of them.

I am highly indebted Marathwada Mitra Mandals Polytechnic for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.I would like to express my gratitude towards my parents & member of Marathwada Mitra Mandals Polytechnic for their kind co-operation and encouragement which help me in completion of this project. Their commitment to efficient inventory management and customer service has been an inspiration to us.

We want to express our gratitude to everyone who helped create this Smart Plant Monitoring System once more. This project would not be possible without your help and support.

IV. CONCLUSION

Maintaining a weather station in the environment for monitoring purposes allows the environment to protect itself. The environment's sensor devices must be used for data collection and processing in order to achieve this. We can make the environment more realistic by using sensor devices in it. The user will then have access to the gathered data and the analysis' findings over Wi-Fi. In this study, an effective, low-cost embedded system that monitors the surroundings is provided. Additionally, it uploaded the sensor parameters to the cloud. This information can be easily shared with other users and will be useful for upcoming analyses. This model can be enhanced to keep an eye on industrial zones and growing cities.

REFERENCES

1. https://ieeexplore.ieee.org/document/9025847/
2. https://ieeexplore.ieee.org/document/9655818/
3. https://ieeexplore.ieee.org/document/8982713/
4. https://ieeexplore.ieee.org/document/8653691/
5. https://ieeexplore.ieee.org/document/6701797/

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