EXAMINATION OF WEATHER DRIVEN BY ARDUINO

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***Abstract*—** With the help of the open-source platform Arduino, we may create electronics projects quite quickly. It is made up of a physical PCB (Programmable Circuit Board) and software (Integrated Development Environment, or IDE), which is compatible with all well-known operating systems. We create a weather monitoring system with the Arduino using temperature and humidity data from an AHT10 sensor. During testing, the device was able to determine the type of weather based on the precise temperature and relative humidity within a 20-meter radius.

Keywords—Weather Parameters, AHT10 Sensor, Soil Moisture Sensor, CO Gas Sensor.

I. INTRODUCTION

Recent years have seen a lot of interest in environmental monitoring and climatic change. Man wants to be aware of the most recent weather conditions in any location, such as a college campus or any other specific facility. It has environmental sensors that may be used to take measurements wherever it is. We used the Arduino Uno and many environmental sensors, including the AHT10, Soil Moisture Sensor, and Raindrop Sensor, to achieve this. The weather parameters are constantly sensed by the sensors.

II. BLOCK DIAGRAM

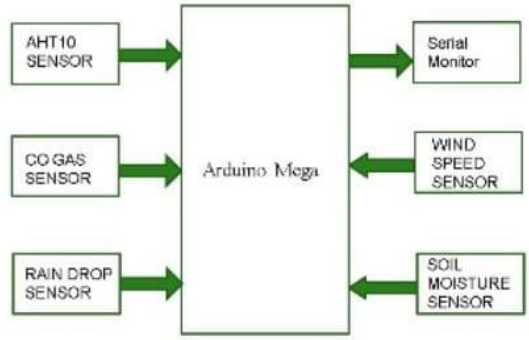


Fig. 1. Block Diagram

The Arduino Mega serves as the system's "heart," wherein all other parts are connected. The brains of the gadget are going to be Arduino. The arduino's sensors will continuously sense the weather parameters and transmit the data to it. The data is kept on the Arduino. The sensors' storage capacity for data storage is constrained. When the Arduino is powered on, it begins to function and its sensors begin to collect data. Each has specific tasks to complete, such as measuring moisture levels in the soil, temperature, and humidity, rainfall using a rain drop sensor, and air quality using a CO2 sensor.

III. COMPONENTS

A. Arduino Mega 2560

The Arduino mega 2560 is the main unit of this system. It will take in the signal from a number of sensors that are attached to it and control the system's operation in accordance with the software. Moreover, it is needed to interface the sensors, GSM, GPS, and many other components

B. *Raindrop Sensor*

A simple-to-use gadget that can detect rainfall is the raindrop sensor, also known as a rain detector sensor. In addition to acting as a switch when raindrops touch the sensor, it can also monitor rainfall intensity with a few little code modifications.

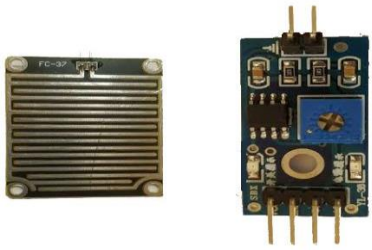


Fig. 2. Raindrop Sensor

C. *Soil Moisture Sensor*

The amount of water in the soil is essentially measured by its moisture content. A soil moisture sensor that comprises of two conducting probes that function as a probe can be used to measure this. Based on the variation in resistance between the two conducting plates, it can calculate the soil moisture content.

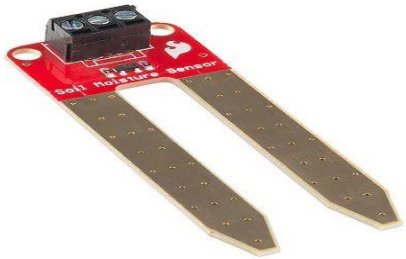


Fig.3. Soil moisture Sensor

D. *MQ9 Sensor*

The An electronic device called a gas sensor is used to measure the quantity and concentration of particular gases in the atmosphere. These sensors are most frequently used to detect the gases carbon monoxide (CO), hydrogen (H2), methane (CH4), and propane (C3H8).

Fig. 4. CO gas Sensor

E. *AHT20 Sensor*

At certain times throughout the day, the temperature and humidity are measured through the use of an AHT20 sensor.

Fig. 5. AHT20 Sensor

F. *LCD*

A sort of display that makes use of liquid crystals is the LCD (Liquid Crystal Display). Here, we'll take the computer's serial input and upload the Arduino sketch. On the LCD, the characters will be shown.

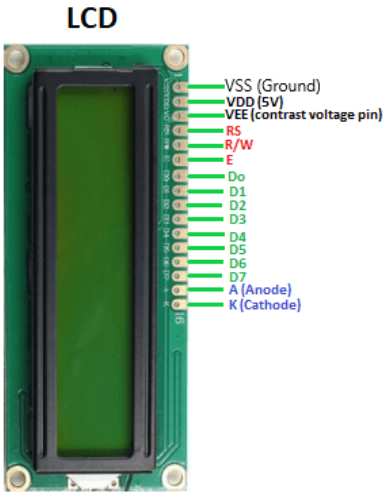


Fig.6. LCD

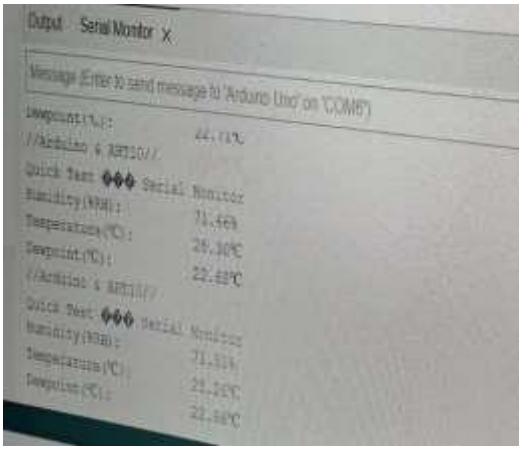
IV. WORKING

One small electronics device with an Arduino Mega 2560 controller, Flex Sensor, GSM, and GPS module will be installed in each tree. Flex sensors will be used to identify tree chopping. GSM and GPS modules will be used for communication between the trees and the server. The project unit, which is mounted to the tree, continuously monitors the sensor output signal. When a human or animal moment occurs, the PIR sensor will recognize it, convey the position information to the appropriate person, and the LED will glow. The threshold value of the flex sensor ranges from 700 to 860. If the tree bends beyond certain limits, a fallen tree is identified, and the authorized person is notified of its position. The threshold value for the accelerometer sensor ranges from 315 to 325. If the tree vibrates more than these values, its movement along the X and

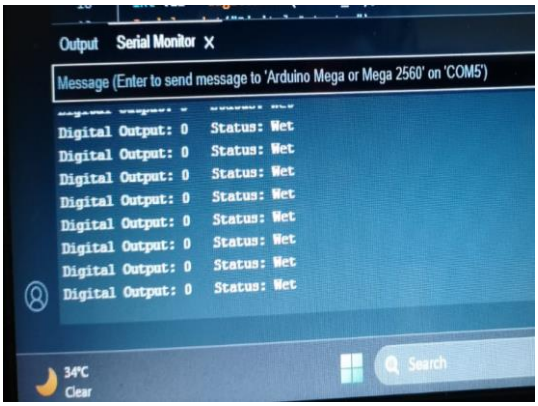
Y directions is identified, and the position data is sent to the appropriate authority. In this way smuggling of trees can be controlled.

V. RESULT

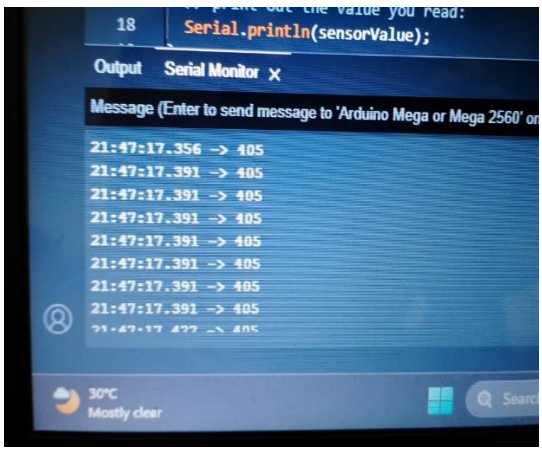
a) TEMPERATURE AND HUMIDITY



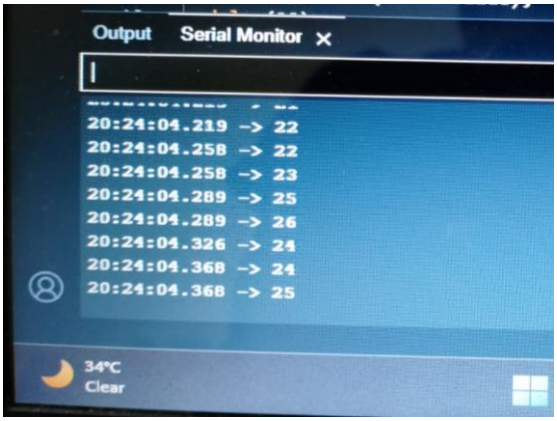
b) RAIN DROP SENSOR



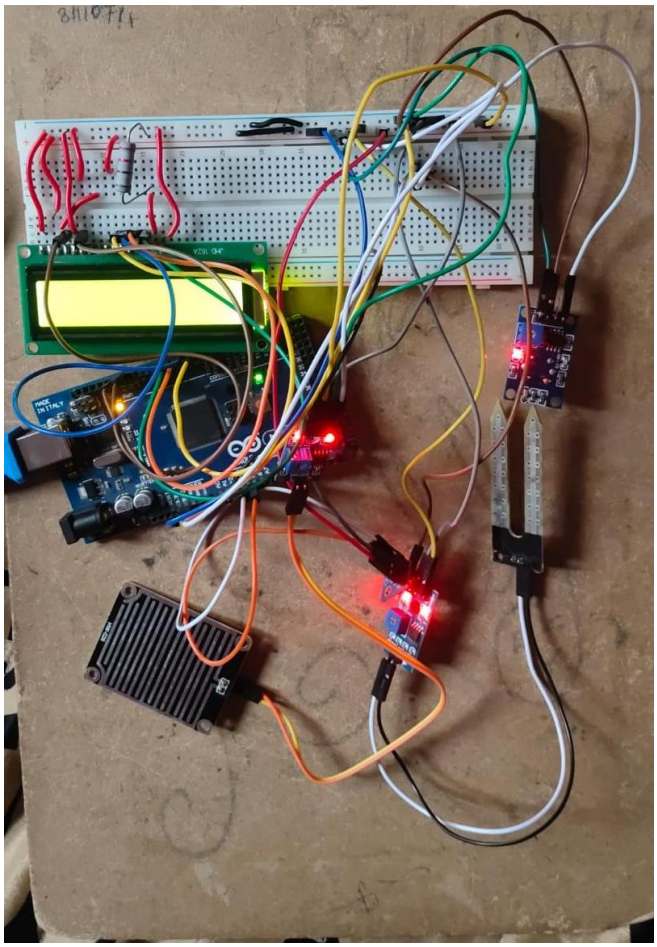
c) SOIL MOISTURE SENSOR



D) CO GAS SENSOR



F) OVER ALL UNIT



VI. CONCLUSION

The ecosystem can protect itself by using a weather station for monitoring, creating a "smart environment." 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. This research presents an effective, affordable embedded system for monitoring the environment.This model can be enhanced to monitor pollution in industrial areas and emerging cities. This model offers a practical and affordable method for ongoing environmental monitoring in order to safeguard the public health from pollution

VII. FUTURE SCOPE

As a global feature of this system, one can add a few additional sensors and link it to the satellite. adding additional sensors to track pressure, oxygen, and other environmental variables. This real-time system has a wide range of applications in the aviation, navigation, and military industries. It can be used in hospitals or other medical facilities to conduct research and study on the "Effect of Weather on Health and Diseases" and afterwards improve warnings for precautions.

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