Research on Data Encryption Standard based On AES Algorithm in IoT Environment

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ABSTRACT–The biggest issue facing the globe today is air pollution. Due to the release of hazardous chemicals into the atmosphere, such as CO2, and dust sensors, the world is becoming more contaminated. We are creating an IOT-Based Pollution Monitoring System to track the Air Quality via an internet website in order to conduct studies. Current tracking methods require laboratory analysis and have poor accuracy and sensitivity. As a result, better surveillance methods are required. We suggest a three-phase pollution monitoring method to address the problems with current solutions. The air purity will be displayed on the LCD and on a website in PPM so that we can readily watch it. With this IOT project, you can use a PC or mobile device to check the smog level from anywhere.The MQ2 and dust sensors are used by the device to measure air quality. It precisely counts their presence and identifies dangerous chemicals. So, using IOT-based gadgets and sensors with an Arduino microcontroller, the air quality of a specific location can be tracked. The goal of this research study is to comprehend information on environmental variables and also to enable simple integration into any other type of internet-based architecture (IoT) that permits the use of sensors capable of gathering information on sensors related to smart city environment measurements, with the goal of providing data on information relating to environmental pollution.

Keywords: Module, Node MCU, Arduino Microcontroller, Gas Sensor, GPS, Dust Sensor

I. INTRODUCTION

This paper serves as a model. We urge writers to adhere to a few straightforward rules. Basically, we require that you create your work. Nearly every region of the world now has access to the Internet, which has an unfathomable impact on daily living. Thus, the "Internet of Things (IoT)" age is now upon us. In addition to more and more gadgets that have lately acquired internet connectivity, it includes conventional computing devices like computers, tablets, and cellphones. Examples include household items, vehicles, wearable technology, surveillance cams, and a wide range of other items. A gadget needs to have the ability to interact with other devices in order to be a part of the Internet of Things. Consequently, it needs some form of integrated connected or wireless communication. Although Wi-Fi is typically supported by IoT devices, Bluetooth can also be used to transmit data to other adjacent devices. Since they are equipped to interact with other objects, IoT devices are frequently referred to as "smart devices." Many IoT devices not only have the ability to talk, but they also have a variety of sensors that collect valuable data. The Internet of Things offers exciting possibilities even though it is still in its early stages. The Internet of Things will eventually become less of a nebulous concept and more of a way of living.

II.LITERATURE SURVEY

2.1 J. Caubel, T.E. Cados In widely dispersed wireless networks that offer higher spatial precision than is typically seen in ambient air quality tracking, low-cost air pollution sensors are becoming more and more prevalent. Black carbon (BC), a significant portion of particulate matter pollution linked to harmful dangers to human health, cannot currently be measured using a low-cost method. The Aerosol Black Carbon Detector (ABCD), which includes a small weatherproof enclosure, solar-powered rechargeable battery, and cellular transmission to allow long-term, distant operation, is the novel BC sensor presented in this article that is intended to cover this void. This study also illustrates a data-processing technique that lessens the ABCD's susceptibility to changes in ambient temperature, enhancing measurement accuracy in unconditioned working settings. (e.g., outdoors). with over 100 vehicles In conjunction with a commercial BC device (Magee Scientific, Model AE33) located inside a regulated air quality monitoring station, ABCDs was used outside. The 105 ABCDs' measurement accuracy is similar to that of the AE33. The fleet's average accuracy and precision

2.2 D. Peri, S. D. Vassallo This article introduces the design of a mobile air quality monitoring device. As a personal helper, a smartphone programme will track daily exposure to gas pollutants and provide guidance. The application, which is currently in development as part of a bigger air quality monitoring system project, will allow users to track their daily exposure to gas pollutants by fusing user location data and metropolitan air quality data supplied by the network of stationary monitoring sites of the Palermo metropolis.

2.3 E. Phala, A. Kumar The air quality measurement system (AQMS) that is described. We have used the GSM cellular transmission module to create an AQMS. The created device has the ability to detect air-polluting gases like CO2, CO, NO2, and SO2 in real-time. The air quality monitoring station's and PC's machine-to-machine communication with the sink node was effectively applied. After comparing different gas sensing technologies, electrochemical and infrared sensors were selected for the device. An AQMS's hardware and software were developed and put into use. The AQMS wirelessly collects readings of the ambient air around it using a variety of instruments.

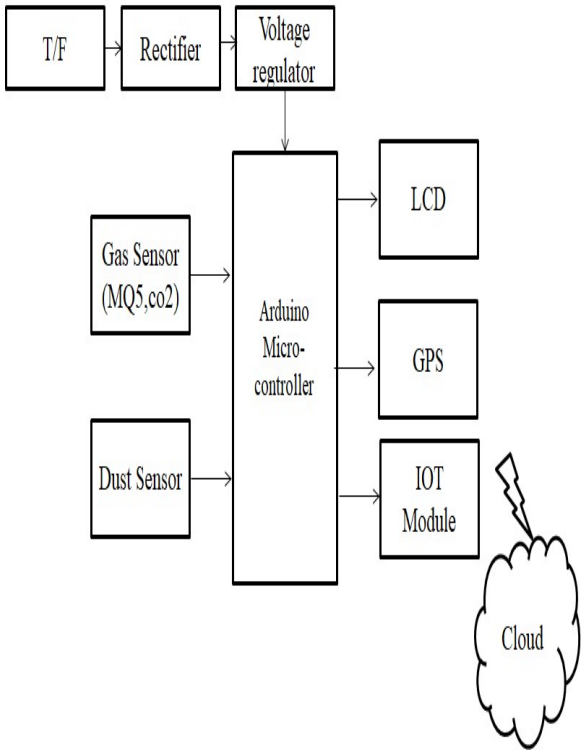
III. EXISTING SYSTEM

In the current setup, This device detects the various kinds of gases present in the atmosphere using an Arduino microcontroller linked with MQ135 and MQ6 gas sensors. After that, it was linked to the Wi-Fi module, which links to the internet. An LCD is used to show the output to the user, and a buzzer sounds a warning when the ppm exceeds a predetermined threshold. Industrial peripheral monitoring, interior air quality monitoring, site selection for standard monitoring sites, and data dissemination were some of their uses. IoT by using a variety of instruments to measure gas concentrations, which were seen through an Arduino serial display. Through the use of Ethernet shield, which is accessible in real time for additional processing, this data is gathered in the thing talk channels. These examined outcomes were observed using a graphical representation of object talk. The findings of the time-controlled Matlab analysis were used to calculate the average pollution level, and an Android app was used to examine the results. The air quality index number was also acquired using the position using the android app. Additionally, the health consequences were also shown in this app so that users could always be conscious of the pollution amounts.

IV. PROPOSED SYSTEM

The proposed system's air quality microcontroller requires digital input, so the analogue output of the sensor was converted to digital form using an ADC and provided as input to the microcontroller. On the LCD, these numbers are constantly presented. The crucial number was entered using a switch pad. The buzzer will sound and a notice will be sent to the website on the mobile phone by the microcontroller via the GPRS module if the amount of pollutants in the air surpasses the critical value inputted. The website, which is accessible from anywhere in the world, is constantly being refreshed with this information. When the pollution level exceeds the critical threshold, a notice was also sent to the website. mobile device gets communication from the router that the server forwards to the internet. The info that the server receives from the smartphone is analysed. It draws conclusions from the data it has gotten and then transmits those conclusions via the internet. The wireless connection between the base station and the distant sensing component has been made possible by IOT modules. A MCU was used to manage every operation on the sensing node while the IOT components interact via cellular networks. The internal ADC of the MQ6 and Dust examines the sensor outputs before computing the gas concentrations and sending the results as messages over the IOT.

4.1 BLOCK DIAGRAM



V. SYSTEM REQUIREMENTS

HARDWARE DESCRIPTION

5.1 NODE MCU

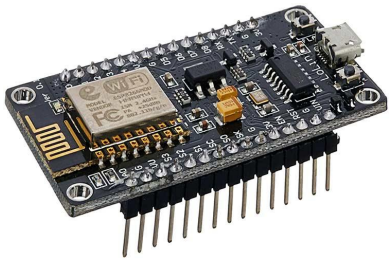


Fig 5.1 Node MCU

NodeMCU is an open-source Lua based firmware and improvement board uniquely focused on for IoT based Applications. It remembers firmware that runs for the ESP8266 Wi-Fi SoC from Espressif Systems, and equipment which depends on the ESP-12 module.

5.2 ARDUINO UNO R3 MICRO CONTROLLER

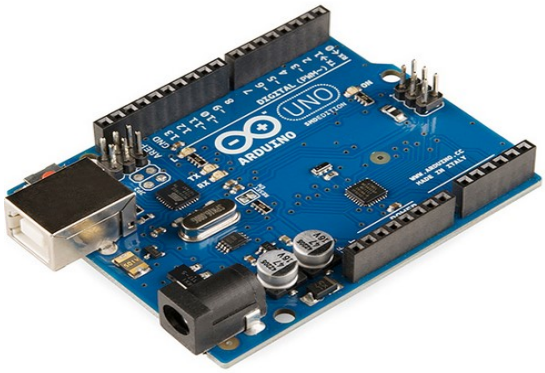


Fig 5.2Arduino Uno Board

The Arduino Uno R3 is a microcontroller. It has 14 computerized input/yield pins (of which 6 can be utilized as PWM yields), 6 simple information sources, a 16 MHz precious stone oscillator, a USB association, power jack, ICSP header, and a reset button. It contain everything expected to help the microcontroller; just associate it to a PC with a USB link or power it with an AC-to-DC connector or battery to begin.

5.3 Power Supply

The AC supply is applied to 12V advance down transformer. The transformer yield is the 12V AC which is redressed utilizing a diode span. The result of Diode Bridge of 12V DC is separated by capacitors.

5.4 GPS

Fig 5.4 GPS

Global Positioning System GPS helps in both following and route reason. Global positioning frameworks is utilized to monitor the vehicle without the intercession of the driver. Be that as it may, a route framework directs the driver to arrive at the objective with next to no interruptions. Both following and route utilizes a similar design. As a mishap happens the following stem distinguishes the clumsy vehicle and a message is shipped off the salvage group through a SMS

5.5 LCD Display

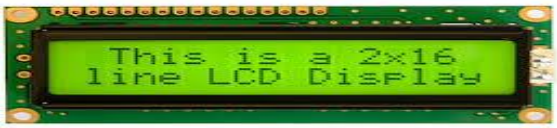


Fig 5.5 LCD

LCD can show numbers, characters and designs. The presentation is interacted to I/O port of microcontroller (P0.0-P0.7). The presentation is in multiplexed mode for example just each show stays on in turn. Inside 1/tenth of a second the following presentation turns on. In this manner consecutively here and there show will bring about consistent presentation of count because of steadiness of Vision.

5.6 Gas Sensor

Fig 5.6 Gas

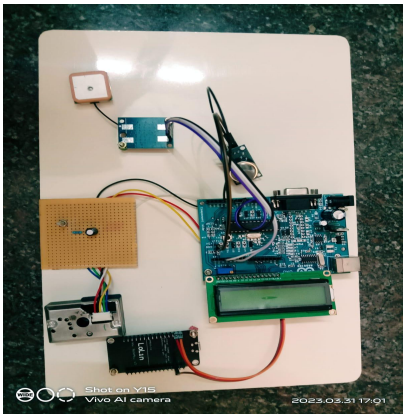
A gas locator is a gadget that distinguishes the presence of gases in a space, regularly as a component of a security framework. This kind of gear is utilized to distinguish a gas spill or different discharges and can communicate with a control framework so an interaction can be naturally closed down. A gas locator can sound a caution to administrators in the space where the hole is happening, offering them the chance to leave. This sort of gadget is significant on the grounds that there are many gases that can be unsafe to natural life, like people or creatures.

5.8 Dust sensor

Fig 5.8 Dust sensor

Dust Sensor is a simple air monitoring module with onboard Sharp GP2Y1010AU0F. It is capable of detecting fine particle larger than 0.8µm in diameter, even like the cigarette smoke. Analog voltage output of the sensor is linear with dust density. The module has embedded voltage boost circuit to support wide range of power supply.

6.SCREEN SHOT



CONCLUSION

Our project was created to assist someone in identifying, tracking, and testing air pollution in a specific location. The package includes a smartphone programme that enables users to forecast the amount of pollution along their complete journey. People may find it useful to determine their degree of exposure to air pollutants with the assistance of this suggested air pollution measurement kit and the integrated smartphone application. The app's highlights included real-time air quality indices, daily air quality reports based on the user's travel distance, and location-based reports for particular air quality measurements. Our ecosystem is primarily impacted by air pollution. It has an impact on human wellbeing in addition to the ecosystem. The monitoring mechanism is used by the mobile application. It keeps note of how much exposure a person has had each day. The detection of leakage gas, carbon monoxide, smoke, and propane was done using gas monitors. The monitor detects gases, converts them to digital data, and shows the information in the application.

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