



AIR POLLUTION MONTORING USING GSM AND CLOUD

P. Indhumathi¹, Mr. R. T. Dinesh Kumar², Ms. P. Brindha³

¹PG Scholar, Department of CSE, Vivekanandha College of Engineering for women (Autonomous), Tiruchengode, India, ²Assistant Professor Department of CSE, Vivekanandha College of Engineering for women (Autonomous), Tiruchengode, India, ³Assistant Professor Department of CSE, Vivekanandha College of Engineering for women (Autonomous), Tiruchengode, India

¹ indhuslaika55514@gmail.com, ² dineshpgm@gmail.com, ³ drraviee@gmail.com

ABSTRACT:

A smart city enables the effective utilization of resources and better quality of services to the citizens. To provide services such as air quality management, weather monitoring and automation of homes and buildings in a smart city, the basic parameters are temperature, humidity and CO₂. This paper presents a customized design of an Internet of Things (IoT) enabled environment monitoring system to monitor temperature, humidity and CO₂. In developed system, data is sent from the transmitter node to the receiver node. The data received at the receiver node is monitored and recorded in personal computer (PC) through a Graphical User Interface (GUI), made in visual basic. The results and the performance of the proposed system is discussed.

Index Terms: Microcontroller, IOT, Pollution Monitoring, Smart city, Internet of Things, Cloud

INTRODUCTION

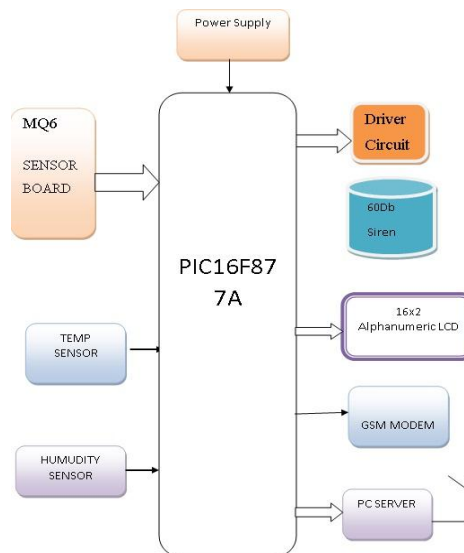
Day to day we are going through the area we came across latest technology. Back in time checking the pollution in a particular area was a very tedious task which was not

very efficient also. With the increasing pollution and advancing technology various new methods were introduced to keep an eye on the rapid increase in pollution more efficiently. Internet of things is one of the latest works that has been done in this path. The increment in use of internet and the interaction of human with machine gave rise to IOT. It allows exchange of information among various devices like fridge, washing machine, automobiles, watches etc. This exchange of information takes place with the help numerous sensors. The account for the success of IOT is its efficiency and makes it a feasible technology at low cost. Air and sound pollution are two main constituents that have the most adverse effect on humans as well as the entire earth. Therefore it is very important to check and control it. Traditional methods involves manual work in which data loggers used to visit the site to collect the data, analyze it and perform comparisons to provide the output which was very lengthy and time consuming besides being inefficient. The monitoring system uses of sensors that detects the sound pollution concentration and level of harmful gases like Carbon dioxide and Sulphur dioxide which pollutes the air. Comparatively using previous stored data in database and output is stored on cloud to make it accessible from remote to everyone. This

paper involves system's description that gives its output with the help of an android application which the user can access in their mobile phones and access it whenever they need.. This device is a useful asset to save precious lives of people and property about it. After that the people are made to clear the area and taken to a safe place.

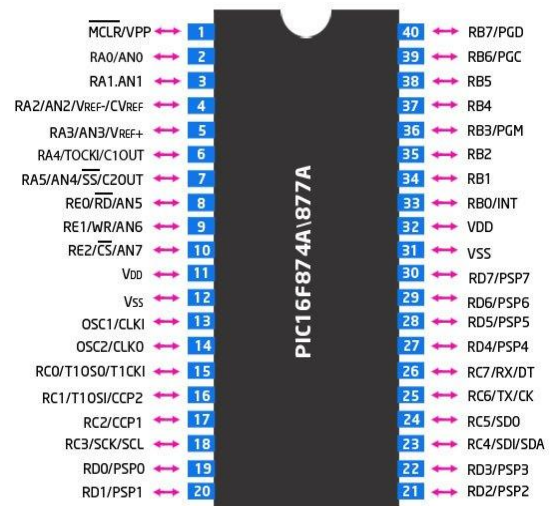
PROPOSED SYSTEM

METHODOLOGY



1. Microcontroller:

The design uses PIC16F877A microcontroller. PIC16F877A is a family of modified Harvard Architecture microcontroller made by Microchip Technology. This is powerful microcontroller with nanosecond instruction execution and easily programmable with only 35 single word instructions. The entire automation of the system is done by this microcontroller. It has an inbuilt Analog to Digital converter. Because of this we do not require any ADC to be connected externally.



2. Temperature sensor (LM35):

The LM35 series are precision integrated circuit temperature sensors, whose output voltage is linearly proportional to Celsius temperature.



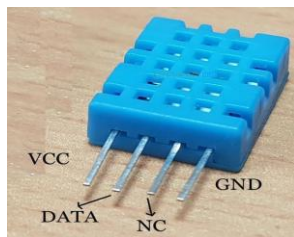
3. GSM modem

GSM module: It is a specialized type of modem which accept a SIM card and operates over a subscription to a mobile operator, just like a mobile phone.



4. Humidity Sensor

The design uses HMTC1A2 Humidity sensor module. It comprises of HSS1101 Humidity sensor and LM35 Temperature sensor. It has the characteristics of stable, high accuracy, quick response and good crossing-over. In the design humidity sensor is used to check the humidity in the air around the crops. The increase in humidity is because of evaporation of water from the leaves which results in withering of the leaves. So the increase in humidity is checked and the sprinklers are activated to attain the moisture on the crops. The reason for the usage of temperature sensor separately is because this model cannot determine the temperatures beyond 50°C.

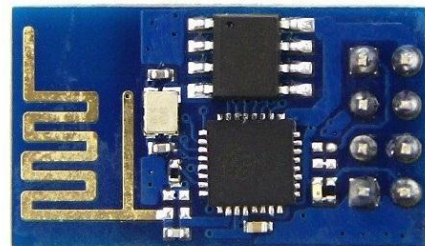


5. ESP8266 W-fi module

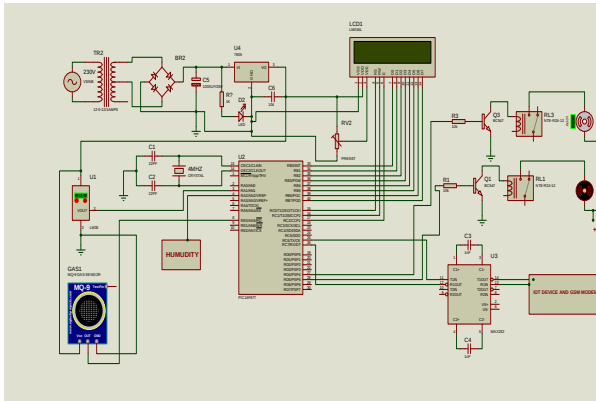
ESP8266 is an UART to Wi-Fi module, a really cheap and easy way to connect any small microcontroller platform having network connectivity is good for any computing system. And add to a system utility we can fetch any data from www. We can push data to cloud for storage, computation or monitoring. We need an external hardware that convert wi-fi data into data format that understood by common microcontroller like UAT, SPI, and I2C

5. MQ135 Gas Sensor

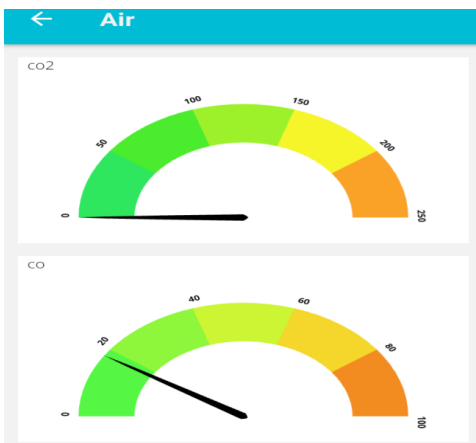
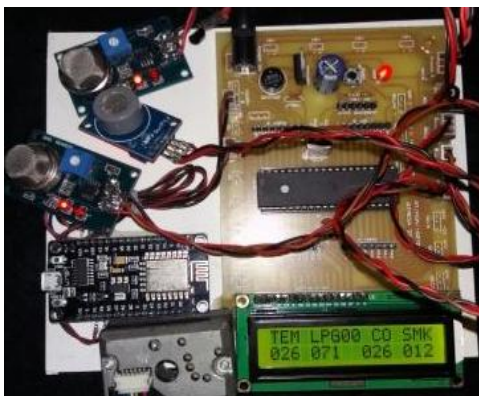
In this project, to monitor the air pollution and to determine the air quality index, a gas sensor, MQ135 is used. MQ135, gas sensor operates at 5V voltage and 40 mA current. It efficiently detects the NH_3 , NO_x , smoke and CO_2 level in air. This sensor is chosen for its wide detecting scope, fast response, high sensitivity, stable and long life and lastly, a simple drive circuit.



CIRCUIT DIAGRAM



RESULT



CONCLUSION

The Air Pollution management system is a further step to contribute a solution to the biggest warning. The air & sound monitoring system solves the problem of the highly polluted areas which is a main issue. It supports the new

technology and effectively supports the healthy life concept. This system has features for the user to monitor the pollution level on their cell phones using the application. So, it becomes very dependent and efficient for the Municipal Corporation officials along with the Civilians to monitor habitat. It allows civilians to get involved in this process adds an more value to it. As civilians are now equally aware and curious about their environment, this concept of IOT is beneficial for the welfare of the society. And it is implemented using the latest technology.

VI. FUTURE SCOPE

The information's that are collected by the sensors could be used by the authorities to take necessary action such as emergency warning messages and evacuation of people to safe places. Further implementing pollution monitoring systems will help to assess how bad air pollution is from day to day and save the environment from further pollution.

VII. REFERENCE

[1] Arushi Singh et al. have proposed a system which uses air and sound sensors to monitor the data constantly and then transmit the data. A raspberry pi module interacts with the sensors and processes the data thereby transmitting it to the application.

[2] Dr. A Sumithra et al. have proposed the concept of a smart city. Technology and communication is the basis of this smart city. Various sensors and modules have also been used to monitor the various environmental parameters. This system uses air and sound sensors to monitor the data and then upload the data on the cloud server as digital data. The cloud storage managers analyze the data and notify accordingly.

[3] SRM. ArthiShri et al. have proposed the idea of monitoring the parameters using a PIC microcontroller which senses the atmosphere signals. Gas sensors are used to measure the pollution level. This data is uploaded on the

internet and can also be viewed through an app.

[4] Seung Ho Kim et al. have designed a monitoring system that uses an environmental parameter analyzer and sends the results in a server through a LTE communication network. The resulted data was compared with the data obtained by the National Ambient air quality Monitoring Information System (NAMIS).

[5] P.Vijnatha Raju, R.V.R.S.Aravind, Sangeeth Kumar, "Pollution Monitoring System using Wireless Sensor Network," International Journal of Engineering Trends and Technology (IJETT), Vol 4, Issue 4 - April 2013.

[6] Himadri Nath Saha, Nilan Saha, Rohan Ghosh, Sayantan Roychoudhury, "Recent trends in implementation of Internet of Things — A review", IEEE 7th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), 2016.

[7] Himadri Nath Saha, Abhilasha Mandal, Abhirup Sinha, "Recent trends in the Internet of Things", IEEE 7th Annual Computing and Communication Workshop and Conference (CCWC), 2017.

