

Air Pollution Monitoring and Controlling System Using IoT

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Abstract - Pollution level is increased day to day by means of massive chemical industries, non-recyclable products manufacturing industries and more transportation producing more toxins in atmosphere which results in dangerous consequences on human wellbeing through without delay affecting fitness of population exposed to it. In order to monitor quality of air, water quality and sound level of the environment over IoT based new framework is proposed which is based on data acquisition, transmission, controlling and aims to building a robust system that help to reduce it and to decrease human interference. And monitoring air over a local host using internet and will activate an alarm when the air quality goes down beyond a non-inhale level, means when there is enough harmful gases are present in the air like chemical substances. PPM on the LCD and in addition to on net page so that we will display and manipulate it very easily. In this IoT project, you can control the polluted air through O2 blower and monitor the pollution level from anywhere using your Wi-Fi enabled computer or mobile devices.

Keywords - MQ2 air quality sensor, Wireless Medium, Air Pollution Controlling, O2 Blower, Water Conductivity Sensor, Sound Sensor.

I. INTRODUCTION

The terms monitoring and evaluation are regularly stressed and used synonymously. The process of industrial satisfactory evaluation is an evaluation of the industrial first-class in terms of standard exceptional set by pollution manipulate board. Due to the complexity of factors determining industrial best, massive variations are determined between one-of-a-kind industries. Similarly, the response to industrial affects is also fairly variable. To design an Industrial machine control and monitoring machine the use of IoT. Surveillance is most crucial security systems in home, industrial, workplace and public places. To construct a robust device which can measure the industrial pollutants and assist to lessen it and to lower human interference in tracking the industrial pollution to lessen air pollution and provide a healthful environment for the employees to paintings in. To build a robust system that evaluates the industrial pollutants continuously and suggests when there may be an growth in emission and controls the polluted air the usage of IoT.

II. RELATED WORKS

Jun Yang Stated that the existence of Sensor networks have been widely used in environment monitoring. Although there are some related works about water pollution monitoring and water pollution source localization using sensor networks, there are many problems which have not been solved so far. In this paper, the current research status on water pollution monitoring and water pollution source localization in sensor networks is illustrated firstly.

Tingkai Liu Stated that the government had been reluctant to address the pollution issue due to concerns about how increasing industry emission controls might affect global competitiveness but with an increasing number of complaints from the expanding middle class coupled with studies that have attributed 1-2 million deaths per year to air pollution the government has now begun to address some of the issues.

Sherine Mary Pollution related deaths increase every year and the leading factor for these deaths is air pollution. Air pollution is caused due to various elements among which pollution due to automobiles plays a pivotal role. Our work considers pollution due to automobiles and provides a real time solution which not just monitors pollution levels but also take into consideration control measures for reducing traffic in highly polluted areas. The solution is provided by a sensor based hardware module which can be placed along roads.

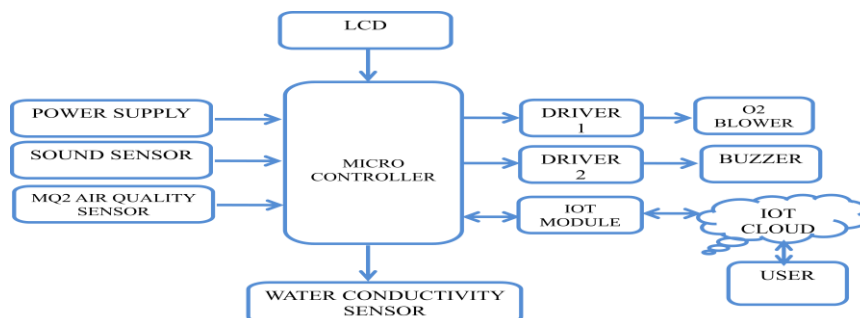
Rizwan Gandomi Internet of Things (IoT) is a worldwide system of "smart devices" that can sense and connect with their surroundings and interact with users and other systems. Global air pollution is one of the major concerns of our era. Existing monitoring systems have inferior precision, low sensitivity, and require laboratory analysis. Therefore, improved

monitoring systems are needed. To overcome the problems of existing systems, we propose a three-phase air pollution monitoring system.

III. PROPOSED METHOD

In this machine air quality can manage thru the O2 blower. Human interference is much less in comparison to the current manual tracking systems. Air quality, water and sound pollutants will be monitored on single system together. At the identical time, tripper unit brought to deactivate the pollution source. Automated system to manipulate the quality of air in 24/7.

IV. SYSTEM ARCHITECTURE



V. SYSTEM METHODOLOGY

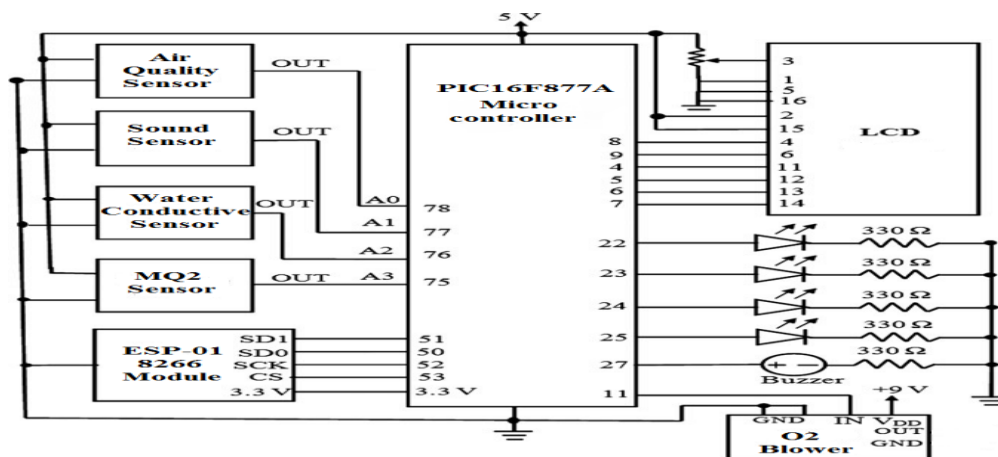
A. Transmitter side

Air level can be monitored using MQ2 Air Quality Sensor. LCD is used to display the quality of air in PPM. When the polluted air level exists then IoT module starts the oxygen blower to control the polluted air. Poisonous level of the air can be identified using MQ2 air quality sensor while buzzer alarmed. Eventually monitoring the sound quality and water quality in a single IoT system PIC16F877A Microcontroller is the heart of this unit. PIC16F877A microcontroller receives the pollution using sensors conditioning unit. When it detects the poisoned level of air, transmitter unit transmits the indication to the receiver side via ESP-12F ESP8266 Wifi Board.

B. Receiver side

Here ESP-12F ESP8266 is used to receive the data of pollution level. If the pollution level is in good circumstance it displays, the air is breathable using LCD. If the air pollution level is in bad condition it shows danger indication, then switch on the blower to lessen the polluted air.

VI. CIRCUIT DIAGRAM



C. Air Quality Sensor

Air quality sensor is designed for complete reveal over indoor air condition. It's aware of a huge scope of harmful gases, as carbon monoxide, alcohol, acetone, thinner, formaldehyde and so on. Due to the measuring mechanism, this sensor cannot output specific information to describe goal gases' concentrations quantitatively. But it is still competent enough to be used in applications that require simplest qualitative results, like automobile refresher sprayers and car air biking systems.

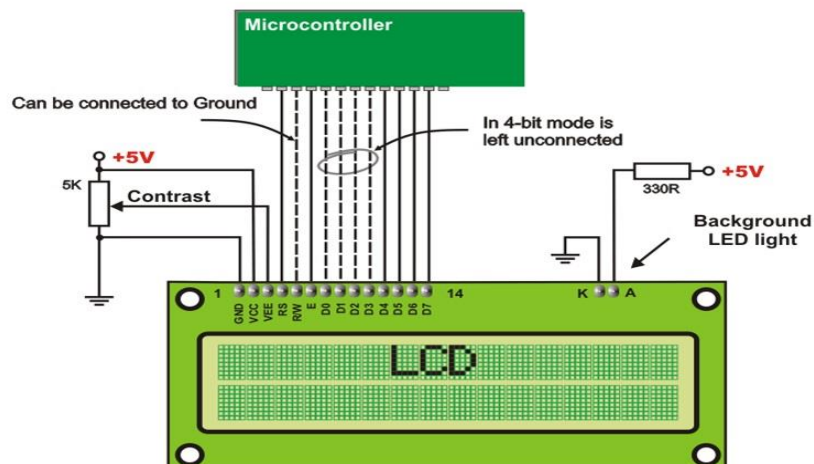


D. LCD Circuit Description

A 16x2 LCD means it can show sixteen characters consistent with line and there are 2 such lines. In this LCD each man or woman is displayed in 5x7 pixel matrix. This LCD has registers, namely, Command and Data. The command register shops the command commands given to the LCD. A command is an instruction given to LCD to do a predefined undertaking like

- Initializing it
- Clearing its screen,
- Setting the cursor position,
- Controlling display & etc.

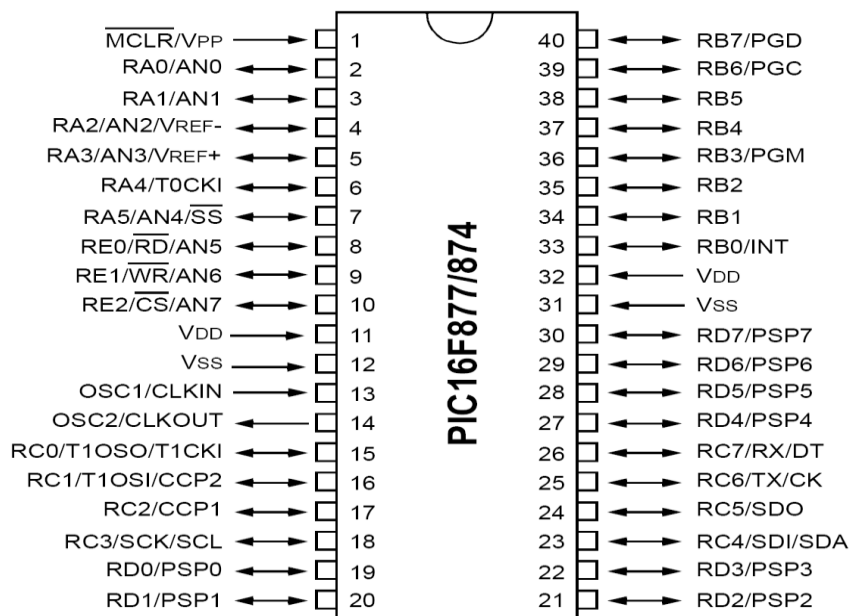
The records register shops the data to be displayed at the LCD. The facts is the ASCII fee of the person to be displayed on the LCD. Click to learn extra about inner structure of a LCD.



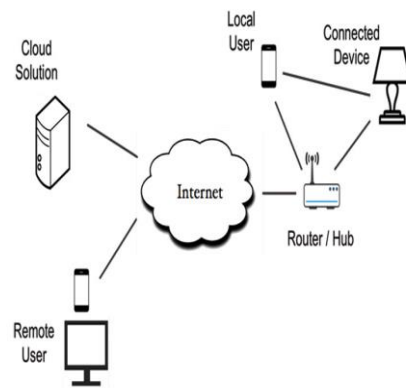
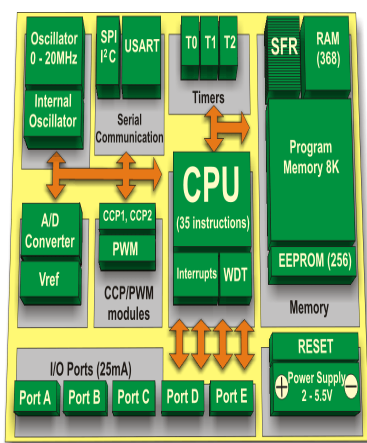
E. Microcontroller

PIC16F877 belongs to a class of 8-bit microcontrollers of RISC architecture. It has 8kb flash memory for storing a written program. Since reminiscence made in FLASH technology can be programmed and cleared extra than once, it makes this microcontroller suitable for tool development. IT has facts reminiscence that desires to be saved when there's no deliver. It is typically used for storing important statistics that must no longer be misplaced if strength supply all at once stops. For instance, one such information is an assigned temperature in temperature regulators. If at some point of a loss of strength deliver this information turned into lost, we would have to make the adjustment once more upon return of deliver.

PDIP



F. Quality Monitoring Using IoT



VII. RESULT

The online utility used to analyse air best information were given from sensors in this proposed programming interface used to control the polluted air via blower and retrieve data from internet of things application using the hypertext protocol over the internet or via a local area network. It also monitors the sound and water quality to offers get right of entry to broad range of embedded devices and web services. This enables the creation of sensor logging applications that can be updated regularly. the user can observe the quality of air evolution of the air quality over time.

VIII. CONCLUSION

The IoT idea may be applied to a wide variety of application. We implemented the usage of IoT in Industrial pollution tracking and this project, actual time air pollution tracking gadget primarily based on IoT is presented. Connected through level converter and an IoT module is connected to get the real time information so that the users can login and get records. Real time tracking of air excellent parameters ensures that the economic emissions stages are maintained at some point of and enables us to tune all the information in a unmarried place (i.e.) cloud and reduce the pollutants based totally on the collected statistics. The implementation cost is very economical because the sensors and the microcontrollers are without problems available. The online database gadget has increased the power by means of updating all cutting-edge parameters of the industries over a common server. The camera may be upgraded in destiny with image processing algorithms to enable a fully automated system for safety, along with hearth alarm, fuel leakage. This allows to generate automated manipulate action in the absence of the legal person.

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