



International Journal of Engineering Researches and Management Studies

AIR QUALITY MONITORING DEVICE

Chavan Sumit*¹, More Shubham², Tambe Ashwini³ and Shenkar Atish⁴

*^{1,2,3&4}Department of Electronics and Telecommunication Engineering, Jaihind Polytechnic, Kuran

ABSTRACT

The project operation depends on the switching mechanism of industrial loads for repeated operations with the help of a user programmable logic control device. The project uses FOUR SENSORS and a microcontroller of 8051 family that operates the loads in three modes: set, auto and manual mode. Programmable logic controllers used in industrial applications are very expensive for simple operations like consecutiveswapping of lots. In this project we shows the functioning of this simple operation using a microcontroller of 89S52 family. In industries, there are many Gases like co2 and no2.The excess of gases is harmful for the industry. So with the help of gas sensors we can control the industrial unit. If the gas exceeds its limit then buzzer will buzz for 15 sec. If within a 15 sec it controls then no any chances of damage but after the 15 sec there is lots of chances of damage then the relay driver circuit will directly auto off the main power and save the industry accident.

Keywords- Microcontroller 8051, Air quality sensors, GSM unit, Relay.

1. INTRODUCTION

Air quality monitoring and analysis is the need of the hour. Air classcheckingcan also be treated and offered in real-time to end operators to feast environmental awareness. The monitoring of powered by the mains power grid. With the advances in micro-electromachine-driven (MEMS) systems, placement of detectingpositions with low cost and smaller size presents a more attractive solution . Large number of such stations can be deployed to form a wireless sensor network (WSN) and are motorizedby solar panels. Investigators have devised pollution models based on emission distribution and have also developed an auto calibration method for air quality sensor networks based on mobile sensors. Such wireless network have been put to use to asses air pollution problems.

The specific objective of the research is to progress an air contaminationobserving system which is able to degree the level of dissimilar gases in atmosphere and forward that information wirelessly to base station, where this information can be stored, processed, and analysed and presented to the end user. Pollution level in the atmosphere is of significance especially to those residents living in a city. Reasonable sitting air quality checking stations is an significantjob for environmental defencestablishments and department, involving: (1) Ensuring that the air quality standard is achieved; (2) planning and implementing air quality protection and air pollution control strategies; and (3) preventing or responding quickly to air quality deterioration. Therefore, the environmental protection department need to site air quality monitoring stations effectively. Bulky air quality monitoring stations are traditionally used for measuring the concentrations of certain pollutants of interest. These stations are large in size, costly, require frequent maintenance and calibration and have high power requirement.



2. BLOCK DIAGRAM

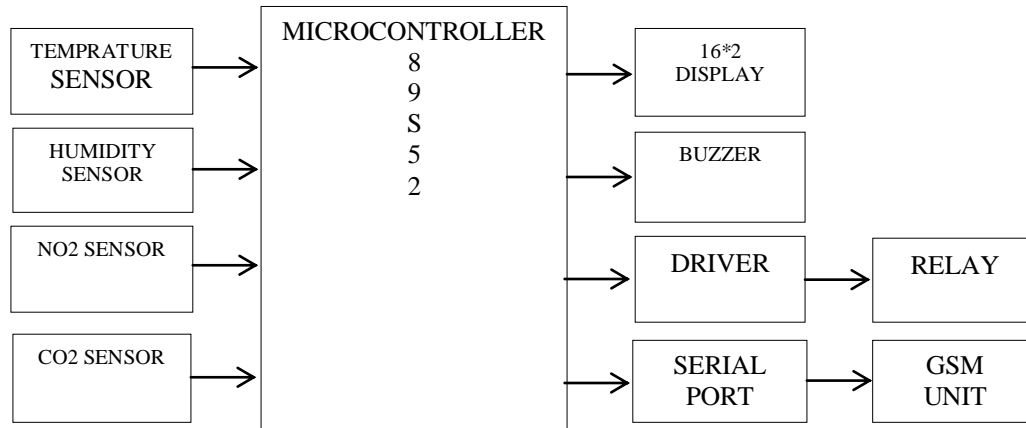


Fig1. Block diagram of Air quality Monitoring Device

The block diagram consists of

- Microcontroller89S52
- Temperature sensor
- Humidity sensor
- NO2 sensor
- Carbon dioxide sensor
- GSM unit
- Relay,Driver
- Display

Block Diagram Description

Air Quality Detection System has four sensors attached to the microcontroller i.e. temperature sensors, Humidity Sensor, Co₂ Sensor, No₂ Sensor Microcontroller Continuously monitors the parameters from sensors and display's them on the LCD. Whenever one of the parameter goes above the threshold value that we have set according to normal conditions then controller makes buzzer 'on'. Microcontroller keeps buzzer on for is 15 seconds. It gas leakage is solved within 15 seconds then buzzer is stopped before completion of 15 sec It gas level does not reduced within 15 seconds then after 15 seconds then the system made off by microcontroller by giving signal to master relay.



International Journal of Engineering Researches and Management Studies

Hardware Implementation

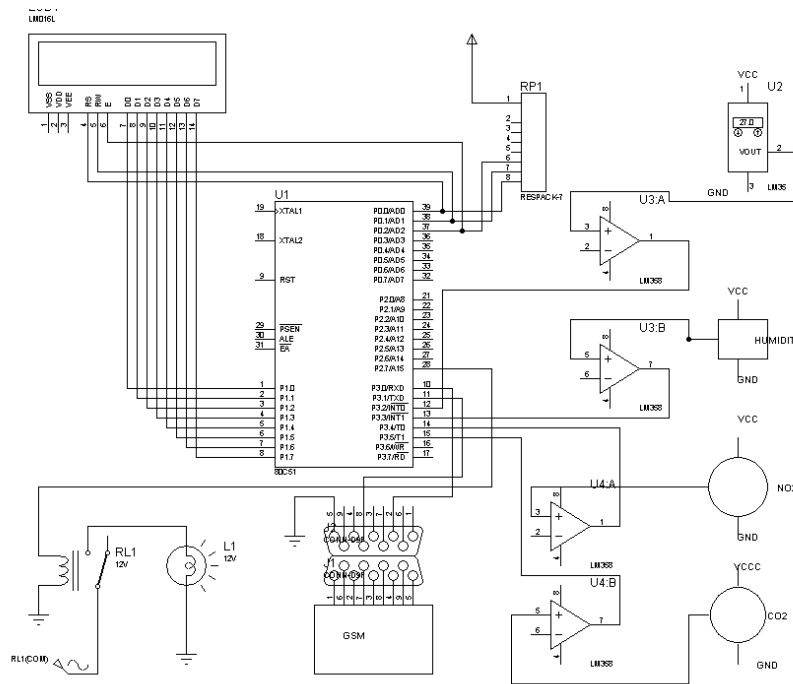


Fig2. Circuit Diagram of Air Quality Monitoring Device

Pin out Description of Microcontroller

As seen in figure above, the 89S52 microcontroller has nothing impressive in appearance:

- 4 Kb of ROM is not much at all.
- 128b of RAM (including SFRs) satisfies the user's basic needs.
- 4 ports having in total of 32 input/output lines are in most cases sufficient to make all necessary connections to peripheral environment.

The whole configuration is obviously thought of as to satisfy the needs of most programmers working on development of automation devices. One of its advantages is that nothing is missing and nothing is too much. In other words, it is created exactly in accordance to the average user's taste and needs. Another advantages are RAM organization, the operation of Central Processor Unit (CPU) and ports which completely use all recourses and enable further upgrade.



International Journal of Engineering Researches and Management Studies

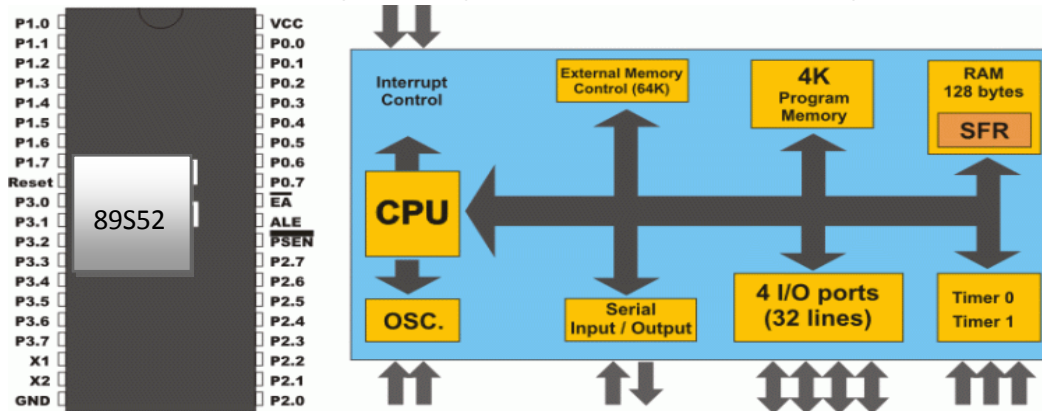


Fig: 3.Pin diagram of Microcontroller

3. ADVANTAGES

- Assessing public health impacts caused by poor air quality.
- Determining whether an area is meeting the standards.
- Evaluating changes in air quality as a result of state implementation plans.

4. APPLICATION

- Domestic air pollution detector.
- Industrial air pollution detector.
- Portable air pollution detector.

5. CONCLUSION

We are trying to develop air quality monitoring system which is having the GSM confirmation for the industrial purpose. This will shows the air parameters like CO₂, NO₂ temperature etc.

6. RESULT

At the output it shows the air parameters like

1. Temperature
2. Humidity
3. CO₂
4. NO₂



Fig4: Air Quality monitoring device

REFERENCES

- [1] Hiroaki Kuze, Yutaro Goto, Yusaku Mabuchi, Hayato Saitoh, Ilham Alimuddin, Gerry Bagtasa, Ippei Harada, Toshihiko Shibashi, Takuma Tsujimoto And Shumpei Kameyama, "Urban Air Pollution Monitoring Using Differential Optical Absorption Spectroscopy (DOAS) And Wind Lidar", IGARS 2012, p.p 3638-3641.
- [2] C. J. Wong, M. Z. MatJafri, K. Abdullah, H. S. Lim and K. L. , "Temporal Air Quality Monitoring Using Surveillance Camera"
- [3] Sebastian Bader, Mathias Anneken, Manuel Goldbeck and Bengt , "SAQnet: Experiences From The Design Of An Air Pollution Monitoring System Based On Off-The-Shelf Equipment", ISSNIP 2011 IEEE, p.p 223-228
- [4] Zhixian Yan, Julien Eberle and Karl Aberer , "OptiMoS: Optimal Sensing for Mobile Sensors", 2012 IEEE 13th International Conference On Mobile Data Management.