Air Quality Monitoring System

P.Gurusamy[1], N.Azarudeen[2], K.Mayoora Balan[3]

Assistant Professor, Department of EIE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India[1]

U.G. Student, Department of EIE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India[2,3]

ABSTRACT: Theoretical Air contamination is one of ecological issues that can't be overlooked. The overwhelming transportation and urbanization result noticeable all around poisons packed in specific regions. Breathing in toxins for quite a while causes harms in human wellbeing. Conventional air quality checking strategies, for example, building air quality observing stations, are ordinarily costly. Moreover, observing stations are commonly less thickly sent and give low goals detecting information. Air quality observing framework dependent on the innovation of remote sensor systems. It likewise coordinates with the worldwide framework for portable interchanges (GSM). The framework comprises of sensor hubs, an entryway, and a control focus overseen by the LabVIEW program through which detecting information can be put away in a database. This framework is conveyed to the primary streets in the city to screen the different level of gases fixation brought about by vehicle discharges, industries or other factors. The test results demonstrate that the proposed framework is appropriate for small scale air quality checking progressively through the GPS and GSM continuously.

KEYWORDS: ATMEGA Arduino controller, LabVIEW program, GPS, GSM

I. INTRODUCTION

To give satisfactory natural and wellbeing security, a powerful air quality checking framework is a fundamental instrument. It is alluring that the framework is straightforward, solid, delicate and practical. What's more this framework must be high touchy to low centralizations of vaporous air contaminants, for example, hydrogen and carbon monoxide which exist in such tobacco smoke. The present pattern for air contaminants observing and caution frameworks advancement is to build the affectability and to lessen the reaction time, specifically at low air contaminants fixations. Run of the mill natural inspecting strategies for these contaminants utilize manual get tests that are gathered nearby and after that shipped to a research facility for examination. These testing techniques can be in all respects expensive and tedious, and continuous research has concentrated on the improvement of sensors that can supplant customary examining strategies to screen contaminants in the earth. Gas sensor dependent on semiconducting materials have happened to extraordinary enthusiasm to sensors clients and scientists. In this specific circumstance, an enormous number of productions have showed up in the writing which manages metal oxide gas sensors and with the model material.[3] To screen temperature and moistness of the air it is reasonable to utilize the as of late seemed new coordinated sensors. These sensors have on-chip temperature remuneration and adjustment, a speaker flag molding that permit interface specifically to any microcomputer with an on-board simple to computerized converter (ADC). Normally the incorporated sensors make an interpretation of the physical amount into 4.1 volt yield extend that is intended to be specifically perfect with ADC contributions of information procurement frameworks (DAQ). In present paper the examination of gas sensor for air contaminants is presented. In light of such semiconducting sensor, bolstered by temperature and moistness coordinated sensors, the plan and execution of virtual framework for air quality observing is recommended.

II. RELATED WORK

Thereare numerous systems available in current days to check Temperature and Humidity or Air quality.Thesesystems are placed in a moving location to read the temperature and humidity.The sensors and technology used are expensive and the data is not available across all the locations(i.e. towns, villages, etc.).

Proposed system:

In our proposed system, we are using gas sensors to calculate the different level of harmful gases and detect the gas level in the atmosphere.UsingAt Mega (A 2560 based Micro controller) which will help us read the data from the sensor and also used to send the data to the receiver.We choose, GPS todetect longitude and longitude, and alsouse GMS to translateand send the Sensor readings to the database.Finally, we will be using GSM module to alert the pollution board

III. SYSTEM BLOCK DIAGRAM
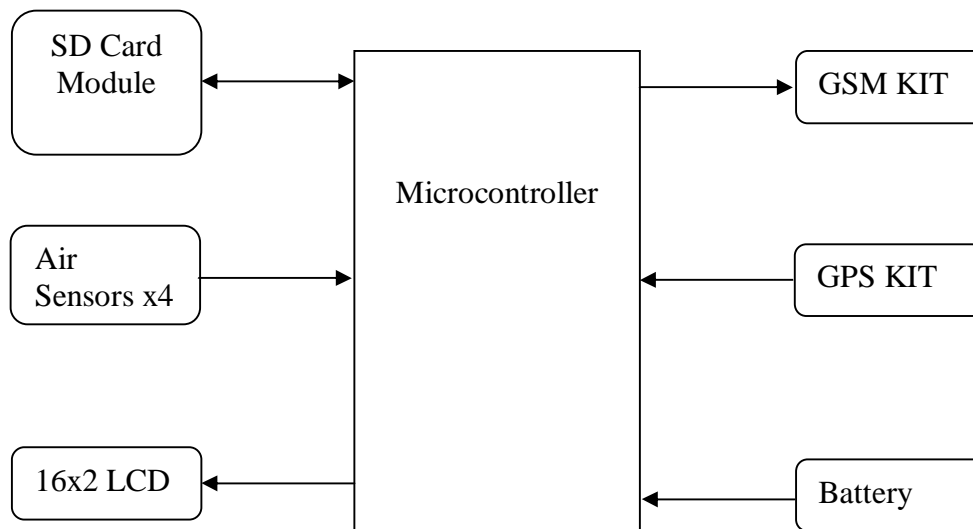
Mechanism:

In this system our main hardware component is ATMEGA Arduino controller 2560 it consists of 92 pins which make the easier way to control the components .the controller connects the 8-pin connection to the LCD display which was followed by the controllers which are the gas sensors that detects the different gases especially hydrogen,carbon-monoxide, Lithium, CO_2, and LPG also the sensors can detect the alcohol and cigarette smoke which may be easily analyzed by the metal oxide gas sensors. The pollution which may be harmful to the humans detected through sensors and reports the particular level of pollution with the help of the GSM and GPS to the municipality the longitude and latitude which way find in the GPS send the particular information as the message (SMS) with the help of GSM as it transmits the message to the particular system or mobile. the global system for mobile communication may require approximately 5v & 2A so there must be a necessity to provide the power bank for the safe transfer of the message service. the power bank requires the capacitance which 510MW power bank supply helps to transmit the message safely, the LCD which is fixed at the other end of the controller which constantly monitor the current level of the pollution of the particular area repeatedly for every 10 seconds as PPM

### IV. EXPERIMENTAL SETUP

GPS – Global Positioning System
The GPS does not require the client to transmit any information, and it works freely of any telephonic or web gathering, however these advancements can improve the handiness of the GPS situating data. The GPS gives basic situating

capacities to military, common, and business clients around the globe. The United States government made the framework, looks after it, and makes it unreservedly available to anybody with a GPS recipient.

GSM – Global System for Mobile Communication

GSM is a cell arrange, which implies that mobile phones associate with it via looking for cells in the quick region.GSM systems work in various distinctive transporter recurrence ranges (isolated into GSM recurrence ranges for 2G and UMTS recurrence groups for 3G), with most 2G GSM systems working in the 900 MHz or 1800 MHz groups. Where these groups were at that point apportioned, the 850 MHz and 1900 MHz groups were utilized rather (for instance in Canada and the United States). In uncommon cases the 400 and 450 MHz recurrence groups are alloted in certain nations since they were recently utilized for original frameworks.
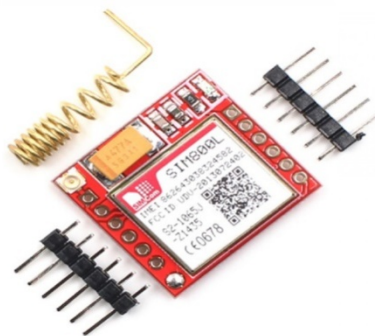
ATMEGA Arduino Controller

The Arduino Mega 2560 is a microcontroller board dependent on the ATmega2560. It has 54 advanced information/yield pins (of which 15 can be utilized as PWM yields), 16 simple sources of info, 4 UARTs (equipment sequential ports), a 16 MHz precious stone oscillator, a USB association, a power jack, an ICSP header, and a reset catch. It contains everything expected to help the microcontroller; basically interface it to a PC with a USB link or power it with an AC-to-DC connector or battery to begin. The Mega 2560 board is perfect with most shields intended for the Uno and the previous sheets Duemilanove or Diecimila

V. RESULTS AND DISCUSSION
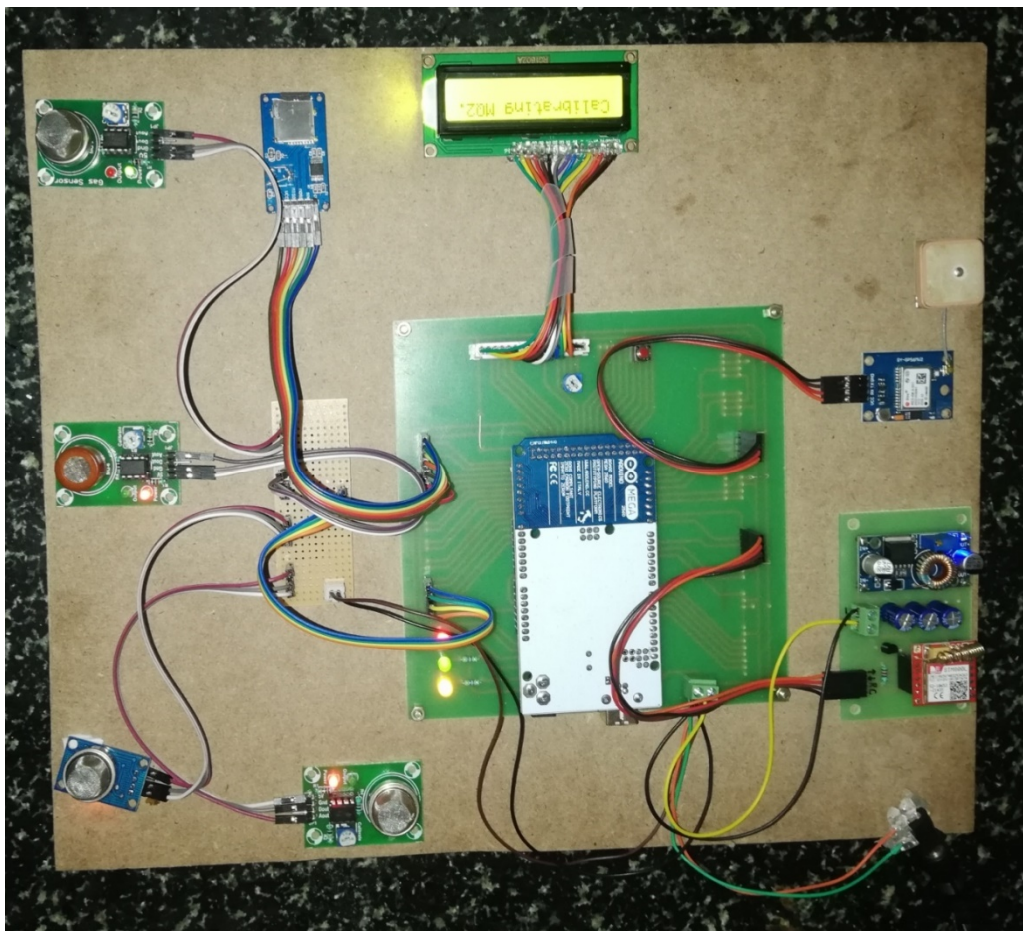
From the above figure it is clear that the air quality is monitored. The device is assembled in such a way to monitor the air quality.

VI. CONCLUSION

Thus, the different sensors are being measured using this system and the details are send to the receiver. When the level of gas are increased the GSM will be send the alert msg to the corporate. Using the data, we could make necessary steps to make the environment clean.

REFERENCES

[1] http://www.euro.who.int/ data/assets/pdf file/0009/128169/ e94535.pdf.

[2]J.Song,H.Lee,S.-D.Kim,andD.-S.Kim,"HowabouttheIAQ in subway environment and its management?"Asian Journal of AtmosphericEnvironment,vol.2,no.1,pp.60–67,2008.

[3] Y.-S. Son, Y.-H. Kang, S.-G. Chung, H. J. Park, and J.-C. Kim, "Efficiency evaluation of adsorbents for the removal of VOC and NO2 in an underground subway station," Asian Journal of AtmosphericEnvironment,vol.5,no.2,pp.113–120,2011.

[4] K.J.Ryu,M.Juraeva,S.-H.Jeong,andD.J.Song,"Ventilation efficiencyinthesubwayenvironmentfortheindoorairquality," WorldAcademyofScience,EngineeringandTechnology,vol.63, pp.34–38,2012.

[5] Y.-S. Son, T.-V. Dinh, S.-G. Chung, J.-H. Lee, and J.-C. Kim, "Removal of particulate matter emitted from a subway tunnel using magnetic filters," Environmental Science and Technology, vol.48,no.5,pp.2870–2876,2014.

[6] K. Y. Kim, Y. S. Kim, Y. M. Roh, C. M. Lee, and C. N. Kim, "Spatial distribution of particulate matter (PM10 and PM2.5) in seoul metropolitan subway stations," Journal of Hazardous Materials,vol.154,no.1–3,pp.440–443,2008.

[7] H.-J. Jung, B. Kim, J. Ryu et al., "Source identification of particulate matter collected at underground subway stations in Seoul, Korea using quantitative single-particle analysis," AtmosphericEnvironment,vol.44,no.19,pp.2287–2293,2010.

[8]K.H.Kim,D.X.Ho,J.-S.Jeon,andJ.-C.Kim,"Anoticeableshift inparticulatematterlevelsafterplatformscreendoorinstallationinaKoreansubwaystation,"AtmosphericEnvironment,vol. 49,pp.219–223,2012.

[9] S.-B. Kwon, D. Park, Y. Cho, and E.-Y. Park, "Measurement of natural ventilation rate in seoul metropolitan subway cabin," IndoorandBuiltEnvironment,vol.19,no.3,pp.366–374,2010.