

Vehicular Pollution Monitoring Using IoT

Usha.S¹, Naziya Sultana.A², Priyanka.M³, Dr.Sumathi.S⁴

UG Scholar, Dept. of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India^{1,2,3}

Head of Department, Dept. of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India⁴

ABSTRACT: Nowadays, vehicle usage is very much higher. Most of the people are using gas fuel instead of petrol or diesel. This method is quite easy but on the other hand it is harmful also. So, these types of Vehicles required proper monitoring. The project aims to modify an existing safety model employed in domestic field. The aim of this project is designing microcontroller based toxic gas detection, and if the gas has detected it automatically alert the owner and then it transmits the warning message to the authorized user. This safety system can be used in any automation field, Houses etc. Traffic accidents are one of the leading case of fatalities. An important indicator of survival rates after an accident when emergency medical personnel are dispatched to the accident locations. IoT provides a virtual view via the internet protocol to a huge variety of real life objects. IoT application long term environmental monitoring application, wireless-sensor network (WSN), WSN optimized design, WSN flat form, WSN protocol.

KEYWORDS: Vehicular pollution, IoT, wireless-sensor network

I. INTRODUCTION

The monitoring system of harmful gas inside special vehicle has many advantages such as

- advance performance
- high reliability

The detection unit reaches the maximum threshold level, at the same detects any toxic gas it send an SMS through GPS. User can send SMS and receive SMS through GPS, based on that User can control some appliances in host section. This is a very compelling reason that justifies designing such a safety system Many air pollution systems in various areas were reported in literatures. Proposed an environmental air pollution monitoring system that measures CO₂, NO₂, CO, HC & NH₄ concentration using mobile sensors in urban environment. The acquired information about air pollution in surroundings is then stored on central on-line repository system periodically. It uses a wireless GPS connection for transferring data to a central computer. Proposed a wireless sensor network to monitor air pollution levels of various pollutants due to environment changes. This system proposes a method which mainly focuses on longer sustain time period of sensor network by effectively managing energy in sensor network, effectively processing of information between various sensor nodes.

II. SYSTEM ANALYSIS

The LPC2141/2/4/6/8 microcontrollers are based on a 32/16 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combines the microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16 bit Thumb mode reduces code by more than 30% with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/2/4/6/8 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale.

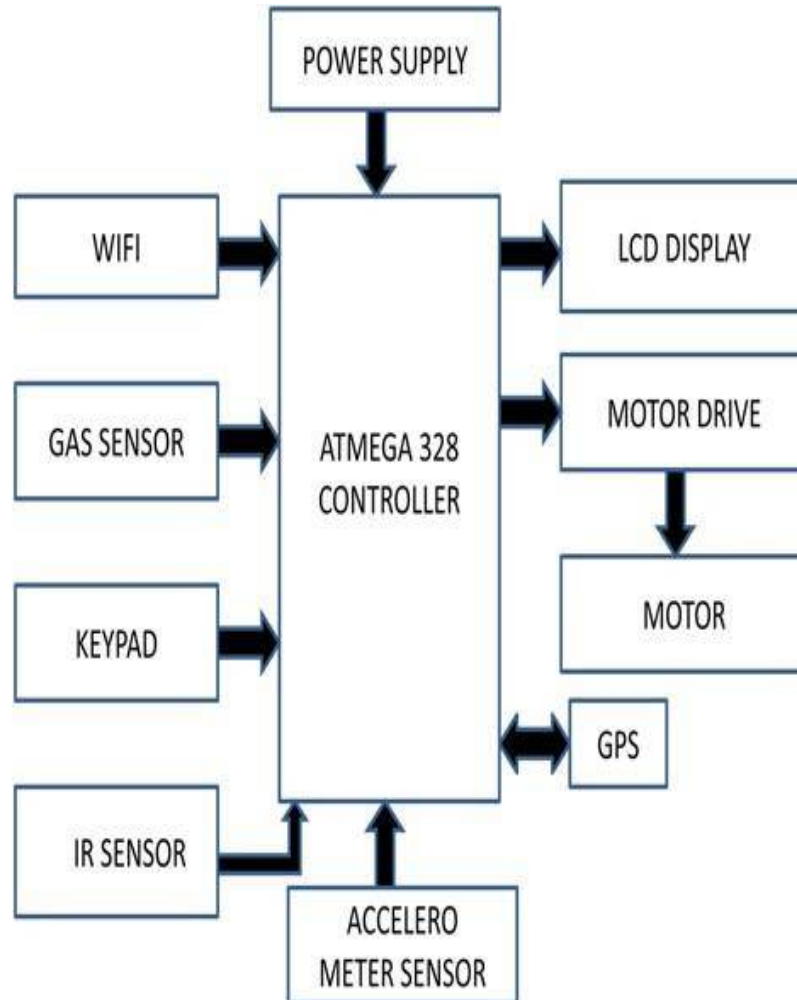


Figure1: Block Diagram

The ARM7TDMI-S is a general purpose 32-bit microprocessor, which offers high performance and very low power consumption. The ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler than those of micro programmed Complex Instruction Set Computers (CISC). This simplicity results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective processor core. Pipeline techniques are employed so that all parts of the processing and memory systems can operate continuously. Typically, while one instruction is being executed, its successor is being decoded, and a third instruction is being fetched from memory. The ARM7TDMI-S processor also employs a unique architectural strategy known as Thumb, which makes it ideally suited to high-volume applications with memory restrictions, or applications where code density is an issue. The key idea behind Thumb is that of a super-reduced instruction set.

A. PROBLEM STATEMENT:

- Identify status when accident occurs
- Manual operation for transferring information Controlling through man

- Difficult to senses fuel leakage

B. PROPOSED SYSTEM:

- Effective safety system
- Systematic approach for monitoring and control Transferring messages through wireless technologies
- Easy way of sensing gas and temperature

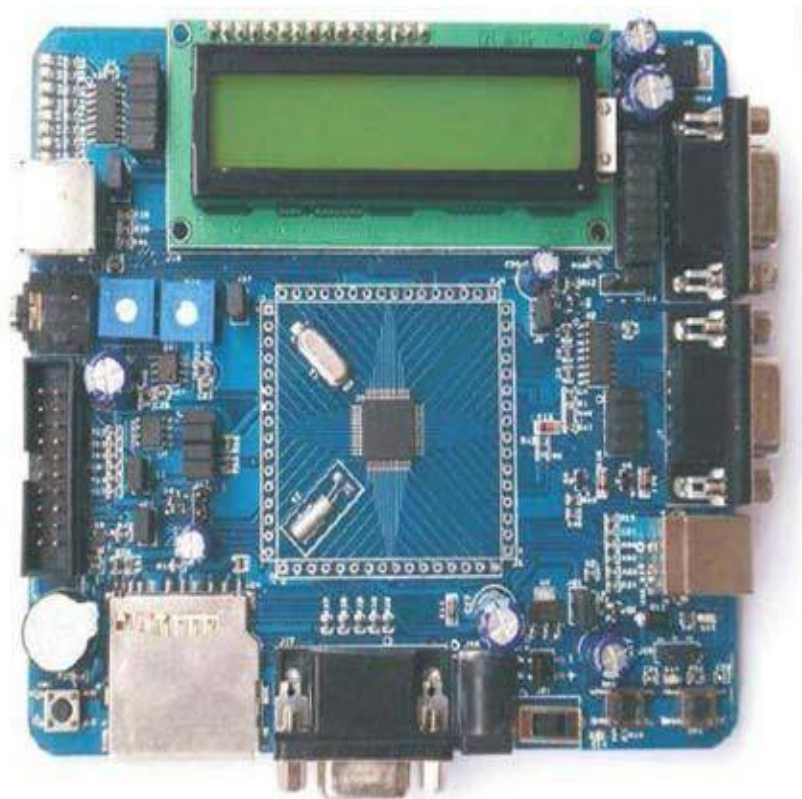


Figure 2: microcontroller

III. CONCEPT OF GPS

A GPS receiver calculates its position by precisely timing the signals sent by the GPS satellites high above the Earth. Each satellite continually transmits messages which include

1. The time the message was transmitted
2. Precise orbital information (the ephemeris)
3. The general system health and rough orbits of all GPS satellites (the almanac).

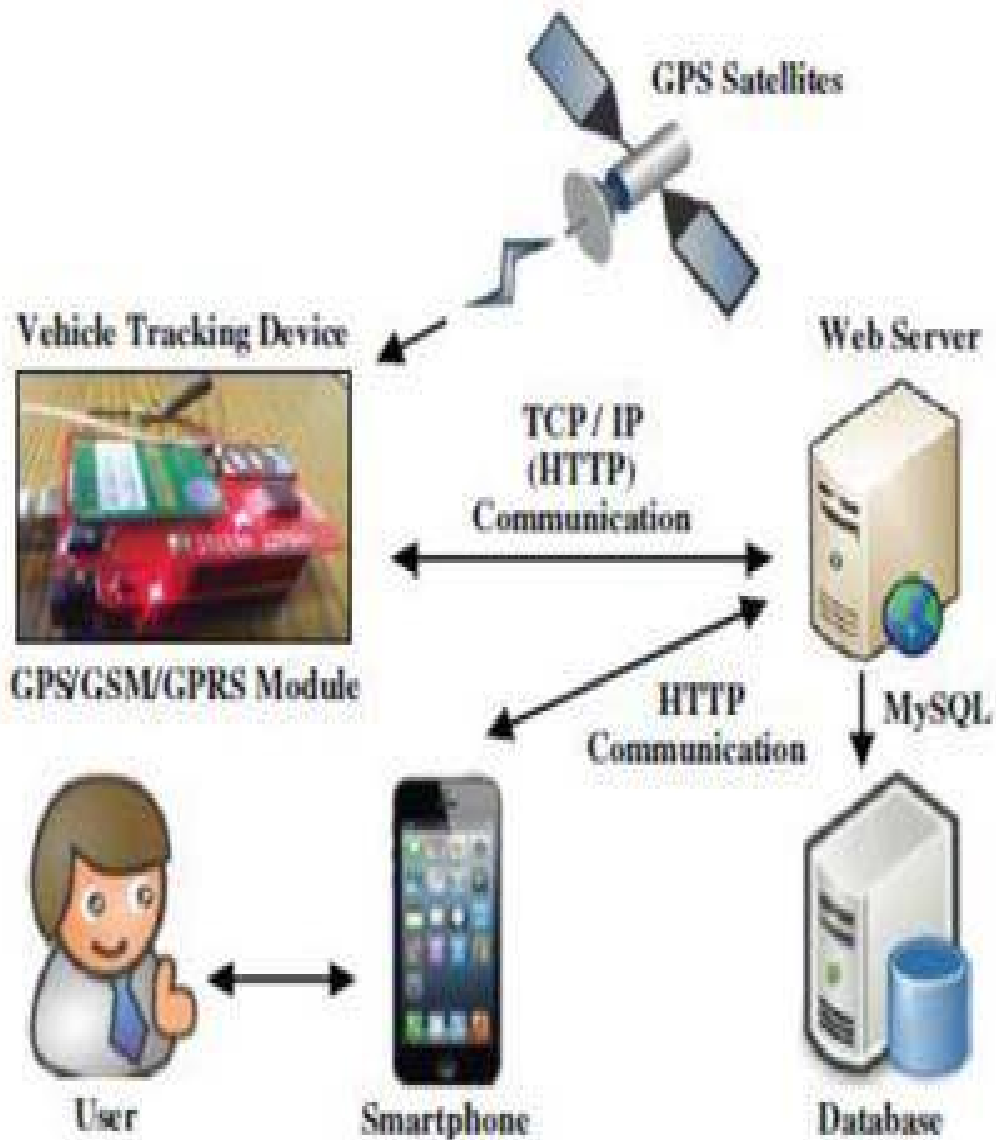


Figure 3: GPS Operation

IV. FLOW CHART

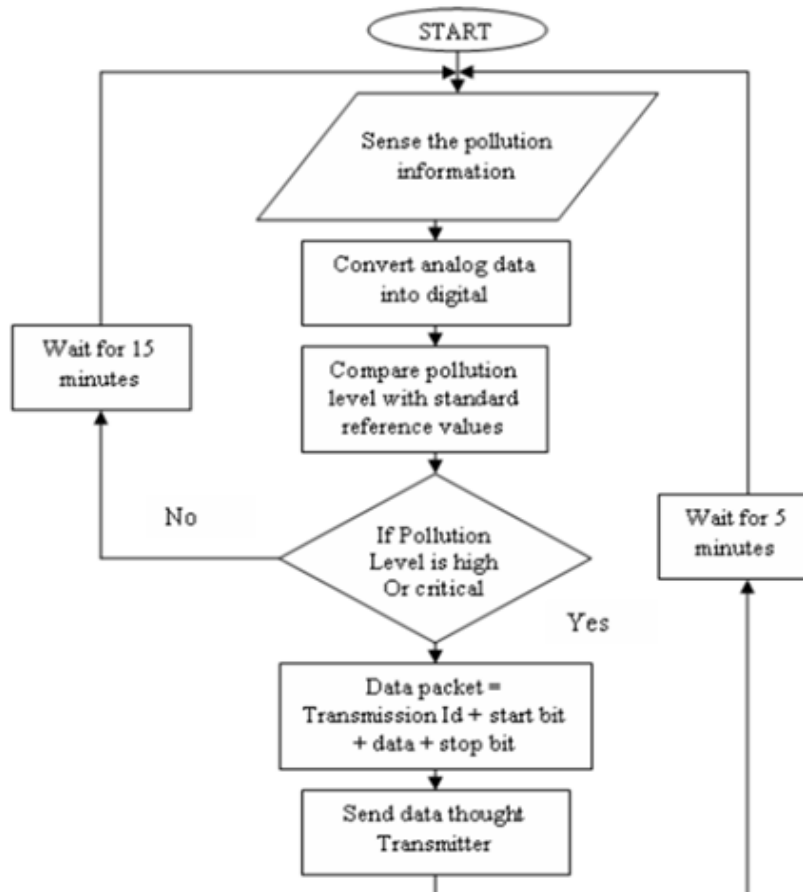


Figure 4: Flow Chart

V. CODING

```

#define Relay1 RB0
#define Relay2 RB1 unsigned char ch2,ch0; unsigned char DT(void); unsigned char CU(void); void
Serial_init(void);
void DelayMs(unsigned int Ms1);
void DelayMs(unsigned int Ms1);
{
int delay_cnst1;
while(Ms1>0)
{
Ms1--;
for(delay_cnst1 = 0;delay_cnst1
<110;delay_cnst1++);
}
}
void main()
{ Serial_init(); TRISA=0xff;

```

```
ADCON1=0x00;  
DelayMs(10); TRISB = 0x00; PORTB = 0x0F; RBPU = 0; Relay1 =1; Relay2 =1; while(1)  
printf("AT+CMGS="+917845682027"\r"); printf("EB No :E281 Using Over Load\r\n"); putch(0x1a);  
DelayMs(250); TRISC=0xc0; TXSTA=0x24; SPBRG=64; RCSTA=0x90;  
TXIF=1;
```

VI. CONCLUSION

As discussed in this paper, recent technological developments in the miniaturization of electronics and wireless communication technology have led to the emergence of Environmental Pollution Sensor Network. Wireless Air Pollution Monitoring System provides real-time information about the level of air pollution in these regions, as well as provides alerts in cases of drastic change in quality of air. This information can then be used by the authorities to take prompt actions such as evacuating people or sending emergency response team. Node is designed for minimum power consumption with various strategies like sleep mode scheduling and time delay based design. Selection of low power modules also helps in improving power dissipation characteristics. It uses an Air Quality Index to categorize the various levels of air pollution. It also associates meaningful and very intuitive colors to the different categories, thus the state of air pollution can be communicated to the user very easily. The system also uses the AQI to evaluate the level of health concern for a specific area.

REFERENCES

1. Faieza Hanum Yahaya, Yusnani Mohd Yusoff, Ruhani Ab. Rahman and Nur Hafizah Abidin "Performance Analysis of Wireless Sensor Network".
2. Xiaoyan Cui, Xiaodong Zhang, Yongkai Shang, " Energy-saving strategies of Wireless Sensor Networks", IEEE 2007 International Symposium on Microwave, Antenna, Propagation, and EMC Technologies for Wireless Communication.
3. Kavi K. Khedo¹, Rajiv Perseedoss² and Avinash Mungur³, wireless sensor Network Air pollution Monitoring system", International journal of wireless and mobile networks Ijwmn, vol2, no2, may2010
4. Suci Constantin, Florin Moldoveanu, Radu Campeanu Ioana Baciu, Sorin Mihai Grigorescu, Bogdan Carstea, Vlad
5. " GPRS Based System for Atmospheric Pollution Monitoring .
6. Muhammad Adeel Pasha, St even Derrien, Olivier Senieys," A Complete Design-Flow for the Generation of Ultra Low-Power WSN Node Architectures Based on Micro-Tasking.
7. R. Rajagopalan and P .K. Varshney, " Data- Aggregation Techniques in Sensor Networks: A Survey," IEEE Communication Surveys and Tutorials, Vol. 8 (4), pp. 48-63, December 2006.
8. H.Albert, R.Kravets and I.Gupta, "Building Trees Based On Aggregation Efficiency in Sensor Networks," Ad Hoc Networks, Vol. 5, November 2007.