



Landmine And Gas Detector Using Android

Nilay Amar, Mohit Goyal, Prajwal Badhey, Prashant Tiwari

Mr. Vipin Kumar Yadav (Assistant Professor)

**Electronics and Communication Engineering, SRM University
NCR Campus, Modinagar.**

Abstract –

These days the method of detecting a landmine below the ground is carried out by a human being carrying the detector device. Even gas leakage detecting devices are carried by them too. This increases the threat level for the person. There may be a chance that the person gets affected during detection. We need a device which can be operated remotely from a place farther than the target area. The solution to such thing is described in our paper. This paper represents a prototype design of both metal and gas leakage detecting robotic vehicle operated wirelessly. This can be achieved by controlling the movement of vehicle using an android phone paired with Bluetooth.

Keywords: landmine, gas leakage, threat, robotic vehicle, android, Bluetooth.

INTRODUCTION

In this paper, we provide an efficient solution for detection of landmine and gas leakage wirelessly. Nowadays technology is running with time, it has completely occupied the lifestyle of human beings. Even though there is such an importance for technology in our routine life there are even people whose life styles are very far to this well-known term technology. So it is our responsibility to design few reliable systems which can be even efficiently used by them. This basic idea gave birth to the project wirelessly detection of landmine and gas leakage. Here the robotic vehicle is remotely operated using an android phone paired with the device. We have made use of Bluetooth to pair the vehicle with the phone. A microcontroller is used to interface all the sensors and Bluetooth module. The microcontroller forms the heart of the device. The metal detector and gas leakage sensor will operate within the vehicle.

Here we are going to interface the motors with the microcontroller and again Bluetooth with the microcontroller. As the android phone is paired with the Bluetooth of the vehicle, the movement of the vehicle is controlled using an app on the phone. The vehicle will be moved in any desired direction and we can see it using a camera placed on it. As the vehicle detects a landmine buried underground or comes in contact with the inflammable gas in its environment then a buzzer starts beeping. The camera can be switched ON/OFF with the same app used to control the movement. There is also a feature of flashlight which will glow automatically if the target area is dark. This will help in the movement of the vehicle.

The purpose of this project is to detect the landmine or gas leakage. This can be achieved by the use of two different sensors, one which senses the landmine and the other that senses gas leakage. This sensor output can be known by LED which will glow when a landmine or gas leakage is detected.

CONTROLLING AND DETECTION PROCESS

By this project we show that how we use the sensor's and electronics circuit for different industries also. Some time one experiment change the whole world, so it's the duty of engineers to try something different for the future science. May be we don't know which one click the mind and verify the concept.

A. Description of the Circuit Diagram

The heart of the complete system is the microcontroller 89S52. The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8 Kbytes of in-system programmable Flash memory. The AT89S52 provides the following standard features: 8K bytes of flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. A gas sensor and metal detector circuit is interfaced with the microcontroller at pins 1 & 2 respectively. The gas sensor circuit has a comparator with compares the value of pressure of the gas with that of the threshold level preset. A crystal oscillator is provided at pins 18 & 19 to give the clock frequency for microcontroller. The Bluetooth module BR-SC30A is connected at pin 10 & 11 of microcontroller and also to the power supply. Pin no. 10 is used for receiving and pin no. 11 is used for transmitting.

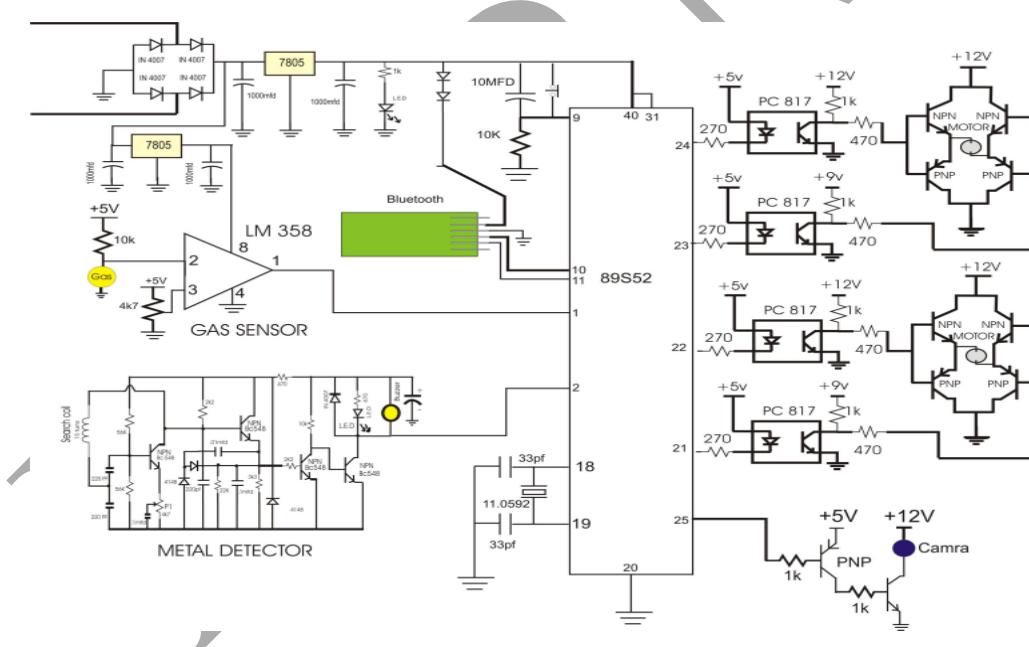


Fig. 1: Circuit Diagram

Two H-bridge connections are made using PNP and NPN transistors. This H-bridge connection is used to operate the motor for the movement of vehicle. H-bridge is used because it is low in cost and has high speed switching. The H-bridge is connected with the microcontroller via an opto-coupler. The purpose of the opto-coupler is to isolate the 12 V supply into 5 V which is used to operate the microcontroller. They are connected at pins 21, 22, 23 & 24. A camera is connected at pin no. 25 of the microcontroller. The microcontroller is grounded at pin 20 and power supply is given at pin 31 & 40.

B. Working of the System

As the power supply is given to the device LEDs will glow which indicates that the device is working properly. The Bluetooth module is placed and the app on the phone is opened. The app will scan for the Bluetooth placed on the device. As it detects it then we will connect the phone with the device using this Bluetooth. Now we can move the vehicle forward, backward, left or right. The center button in the app will stop the vehicle. As the vehicle moves in any direction, the white LED will glow indicating the movement is being done. We can turn ON the camera using this same app and this can be indicated by a blue colored LED. The output can now be viewed using a TV or laptop. Now we will move the vehicle towards the target area. As any metal or landmine comes beneath the coil of copper wire which acts as metal detector, the buzzer will start beeping and a red colored LED will start to glow. We can see the location of the landmine using the camera. If any gas leakage is present in the environment then the buzzer will start to beep and a green colored LED will glow. The different colors of LED are used so that we are able to distinguish between the presence of landmine or gas. The principle of detection of gas leakage lies in the comparison of the pressure level of gas formed by oxidation with SnO_2 with that of preset value. The landmine detection is done on the basis of fluctuations of electromagnetic signals back and forth from the surface.



Fig 2: Prototype Design of Landmine and Gas Detector Using Android

The flashlights are used as LDR (Light Dependent Resistor). Whenever the area gets darkened, the light will start glowing and the path can be viewed even at dark places.

CONCLUSION

It can be seen that the combination of the hardware and software provides landmine and gas detection that can be implemented at relatively low cost and which is extremely user friendly

as everyone knows how to operate an android phone. The device is easy to handle and it is portable to any place without any further difficulty.

REFERENCES

1. A survey on gas leak detection and localization techniques. Department of Automatics and Applied Informatics, Faculty of Automatics and Computers, "Politehnica" University of Timisoara, Bd. Vasile Parvan 2, Timisoara, Romania.
2. Impacts of Metal Detector Use in Schools. ABIGAIL HANKIN, MDMPH MARCI HERTZ, MS THOMAS SIMON, PHD.
3. Metal Detectors for Humanitarian Demining: A Patent Search and Analysis. Christian Sigrist, CH-3012 Bern, Switzerland. Claudio Bruschini, Ecole Polytechnique Fédérale de Lausanne.
4. Digest of Educational Statistics, 2007. Washington, DC: U.S. Department of Education; 2008.
5. **Bruschini, C.:** A Multidisciplinary Analysis of Frequency Domain Metal Detectors for Humanitarian Demining, PhD thesis (in preparation), Vrije Universiteit Brussel (VUB) (2002).

IJERMT