

Comprehending Resourceful Wagon System and Cue Through Wireless Sensor Networks

A. Ananda Kumari, M. Samundeeswari and E. Govindi

Department of Computer Science and Engineering,
Priyadarshini Engineering College, Vaniyambadi, India

Abstract: Detecting vicinity is most important for driver safety. Sophisticated types of sensors are fitted in vehicles to avoid accidents from occurring. The kinematic vehicle state is attained. Traffic type availability is sensed using various sensors. Each year all over the world, thousands of serious injuries happening due to road accidents. This project gives idea to prevent any accidents from occurring in initial state. Some of the additional features like for navigating the land vehicle the GPS and GSM technology are used. The techniques can be implemented in achieving controlled adaptive environment. The various features proposed here makes use of DTMF technology such as collision to be detected automatically giving notification to victims relative, vehicle does not break the signal using light controlled traffic, altering to various speed at different zones, preventing horn from honking in horn prohibited areas, detecting drunk driving by means of alcohol detection and correspondingly sending message to the respective person, preventing theft from occurring by using vehicle security and sending related message.

Key words: Vicinity • Kinematic • Sensors • GPS (Global Positioning System) • GSM • DTMF

INTRODUCTION

A basic thing that one use is transportation and it is need in everyday lives. We need transportation to travel different places if it is distant. We use different modes of transportation like vehicles on road, by sea etc [1]. This gives reason for a lot of vehicular accidents that happen. However, there are those laws to prevent those kinds of accidents from happening, but still to the traffic rules. We could think that doing this thing is too small but it could actually start the lead and change those people who are uncertain of the danger they would face in disregarding rules. Knowing these things, we could actually help in solving the problem by alerting them to be aware of the possible things that would happen whenever they are driving. Currently Road safety systems are available in high end luxury cars such as Audi, Mercedes Benz etc. to name a few [2]. The requirement of embedded systems is the need of the hour in developing countries & especially with the grim statistics of the country, the need is imminent [2].

The features here in the work are:

Controlling vehicle Speed in Variable Zone: in which, speed of the vehicle is controlled in different areas such as on reaching schools and hospital sides [2, 3]. Horn Control of Vehicle in No Honking Zone- Controlling unwanted disturbances in horn prohibited zones such as hospitals, schools. Red Light Traffic Control- In this feature the vehicle is controlled on traffic signal, when red signal is sensed then automatically stops [2, 3]. Automatic Collision Notification- In this feature when vehicle gets into an accident, the system of this project sends messages (SMS) via GSM Modem to the respective owner. Vehicle security- In this feature, if the vehicle is being accessed by unauthorized person or someone tries to break in, theft sensor is activated and messages sent to the owner vehicle via GSM modem [2].

Alcohol Control: The alcohol sensor prevents the key from working when the drivers' breath is sensed for alcohol consumption and a total alcohol quantity is measured as well [1]. Consequently message is sent to the owner who prevents the car from starting up.

MATERIALS AND METHODS

In this work we implement using the chips and the ICs used are- encoder chip, decoder chip, Transmitter-Receiver module, microcontroller, relay driver, alcohol sensors, relay, GSM modem, GPS receiver and LCD display for the message to be displayed.

Hardware Details

AT89s52 Microcontroller: The AT89S52 is a integrated chip with the low-power, high-performance CMOS 8-bit microcontroller that follows the 8K bytes of in-system Flash memory that is programmable. The device is manufactured by using the Atmel's high-density memory technology that is non volatile and is showing its compatible with the Industry-standard of 80C51 instruction set.

Buzzer: A buzzer also known as the beeper (BUZZERS) is a device that is meant for signalling purpose and it is usually a electronic circuit, that is widely used in some of the automobiles, as well as the household appliances such as the game shows. It commonly consists of a wide range of switches or sensors that are connected to a control unit which shows the determination and which button was pushed or a pressed at time has lapsed and usually at sometimes this illuminates a light on the appropriate button or control panel and sounds a warning in the form of a continuous or either the intermittent buzzing or beeping sound.

Gas Sensor: A sensor is a standardized device that detects or to say that senses a signal, sometimes any other physical condition and chemical compounds. It can also be defined as the device that transforms a signal from one form to another form. Sensors are mostly electrical or electronic components using in a circuit or any other devices.

GPS: GPS is totally up of three parts in which they are represented as in between 24 and 32 satellites orbiting the Earth, with them a total of four controls and monitoring the stations on the Earth and the GPS receivers that are owned by the users. These GPS satellites broadcast the respective signals from space that are used by GPS receivers and hence providing three-dimensional location (latitude, longitude and altitude) plus the time is included [4, 5].

AT Commands: AT commands are the commands which are used to control the MODEMs. AT is the abbreviation for the term Attention. These commands are those from the Hayes commands that are being used by the Hayes smart modems. To indicate the attention from the MODEM the Hayes commands are started with AT.

Relay: A relay is a switch that is being operated electrically. The Current that are flowing through the relays coil creates a magnetic field which in turn attracts the lever and hence causes the switch contacts to change.

RF Receiver: Radio frequency (RF) is the rate of the total oscillation within the range of about 3 kHz to 300 GHz, that is corresponding to the radio waves frequency and its alternating currents that carries radio signals. RF refers to mechanical oscillations, though the mechanical RF system does exist. When we turn the emitter switch to on state, then the lamp of the receiver begins to glow bright. When we turn the switch off thus the emitter off, hence the lamp receiver darkens.

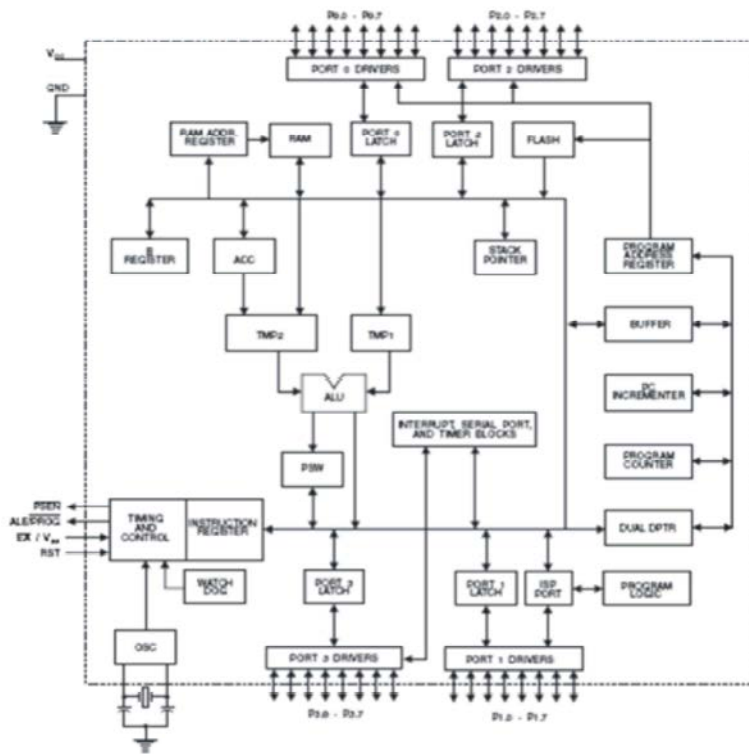
RF Transmitter: The function of the radio frequency (RF) transmitter is enabling to modulate, either up the convertor and amplify the signals for a given transmission into the free space. An RF transmitter includes the modulator which modulates a given input signal and also a radio frequency power amplifier that is bring coupled to a modulator for amplifying the modulated input signal. The radio frequency power which is amplified is then coupled to an antenna that transmits the amplified modulated input signals.

Vibration Sensor: he piezoelectric sensor is a device using the piezoelectric effect that is to measure the pressure, acceleration and also certain strain or force by transforming them to a corresponding electrical signal. Piezoelectric sensors have said to be a advanced tools for measuring the various processes.

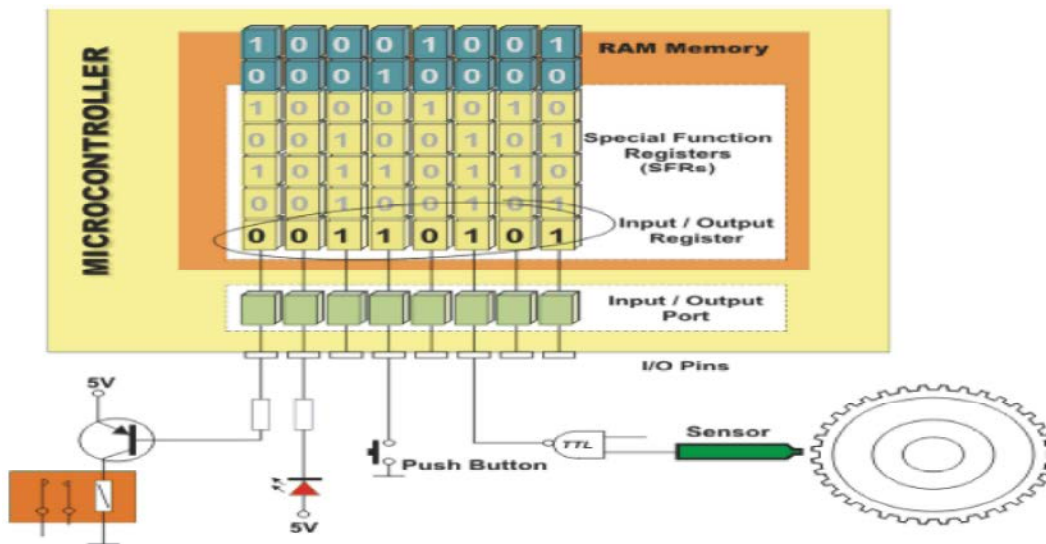
Design Details

CMOS 8-bit Microcontroller: The AT89S52 is constructed with the static logic for operating down to zero frequency and thus enabling the supports for the two software selectable power saving modes. The Idle Mode that stops the CPU while allowing the RAM to operate, timer/counters, along with the serial port and interrupt system to continue the functioning of device [6].

VCC: Supply Voltage, GND: Ground



Input/output ports (I/O Ports)

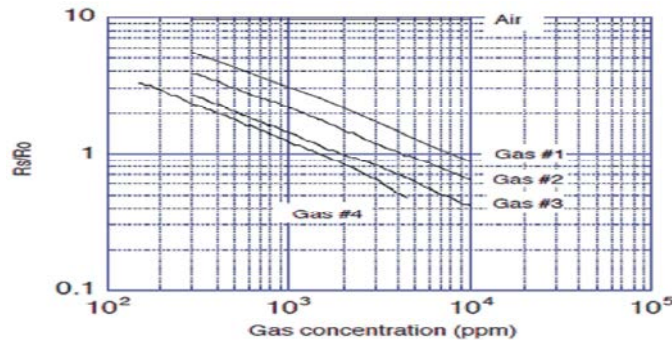
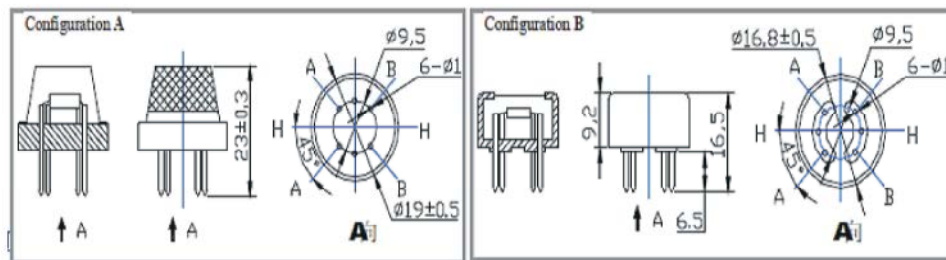


it is possible to change a function of a pin accordingly to individual user's needs. These are the only registers in a microcontroller state through which can be checked by a voltmeter.

Structure and Configuration of MQ-6 Gas Sensor: MQ-6 gas sensor is a sensitivity material with SnO₂ that is with

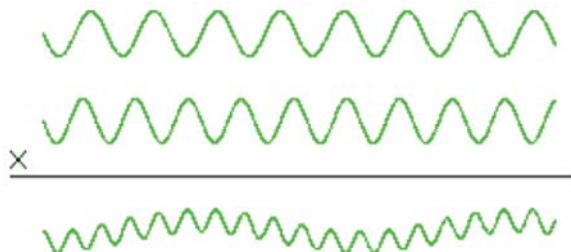
the lower conductivity under a clean air. When there is a target combustible gas, Then the sensor's conductivity rate is more higher along with given gas concentrations rising.

Hence using simple electro circuit that converts the change of conductivity to corresponding output signal of gas concentration.

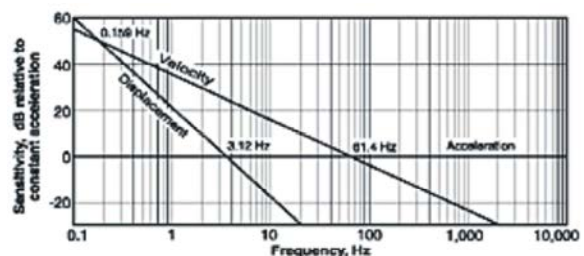


The Super-heterodyne Receiver: The super-hetrodyne receiver is a receiver with a most widely used type of radio receiver. This operates on a mathematical trick: When we multiply a given sine wave by another sine wave with a light difference in its frequency, then we get a result that is the sum of these two sine waves of others.

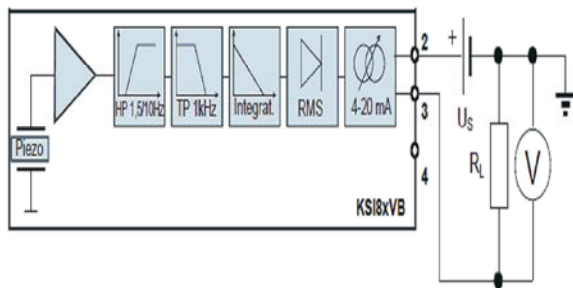
These two sine waves within the result have certain frequencies which are larger and lower than those of that frequencies of the sine waves that are being multiplied. The lowest frequency is equating the difference between frequencies of those two initial sine waves. When the first frequency is said to be of 1, 000, 000 Hz and the second is of 999, 000 Hz then the sine wave will have a frequency of 1, 000 Hz.



Vibration Sensor: The vibration monitoring and analysis with the critical quantity is the mounted sensor. The Three parameters that are representing the motion detected by vibration thus monitors are displacement, velocity, along with the acceleration. These parameters are related and hence are to be derived from a wide variety of motion sensors. Picking up of a sensor proportional with that of displacement, velocity or acceleration is depending on the frequencies of any given interest and signal levels that are involved. Figure 1 shows the relationship between those of velocity and displacements to a constant acceleration. Sensor selection and installation are the factors for the accurate diagnoses of condition for machines.



The element used for sensing is a perfectly shaped piezo-ceramic ring-shear system. This measures the vibration accelerations. These acceleration signal is then amplified following the integrator for velocity of vibration. The signal at the high pass filtered with frequency range of 1.5 Hz (KSI 80VB) or 10 Hz (KSI 82VB) and the low pass filtered at the frequency range of 1000 Hz with the 2 pole filters. The frequency band with the model of KSI 82VB from 10 to 1000 Hz is usually a effective mechanism for the vibrations being caused by imbalance. It is being recommended that in standard ISO 10816-1. Some applications with a slow machinery running rate would may be necessary for measuring from 1.5 to 1000 Hz with a total of KSI 82VB. A effective RMS rectifier with a 4-20 mA current loop transformer makes the signal ready for a long distance to be transmitted. With the KSI 80VB / KSI 82VB a separate supply of power is not required [7, 8].



Software Specifications

KEIL Compiler: The Cx51 Optimizing Compiler to say a C COMPILER is the completely implementing the American National Standards Institute (ANSI) standard for the C language. Cx51 is exactly not a universal C compiler that is used for the 8051 target [9]. It is defined as the ground-up implementation that is dedicating for the generation of extremely fast and compact code for the 8051 microprocessor [9]. Cx51 gives us the flexibility for programming in C and the effective code and speed of assembly language. Since Cx51 is said as the cross compiler, some of the aspects in C programming language and along to it the standard libraries are being altered or enhanced in order to address the embedded target processor [2].

Compiling with Cx51: To initiate the C51 or CX51 compiler, need to enter the C51 or CX51 at the command prompt. On this line of command l, we must add name of the C source file that is to be compiled, as well as if any other necessary control directives are required to compile the source file is implemented as well. The format that is used for the Cx51 command line is shown below [9]:

C51 source file _directives..._
 CX51 source file _directives..._
 or
 C51 @command file
 CX51 @command file

Source file is defined to be the name of the source program that we want to compile. Directives are those directives we wish to use to control compiler functions. Command file is for naming the command input file that may include source file and the other directives. A command file is thus used and when the Cx51 invocation line gets considerably complex and exceeds given limits of Windows command prompt [9].

Atmel 89x8252 and Variants: The Atmel 89x8252 along with the variants provide 2 data pointers that could be used for any other memory access. By Using multiple data pointers we can increase the speed of library functions such as the memcpy, memmove, memcmp, strcpy and strcmp [9]. The MODA2 control directive is instructing the C51 compiler for generating the code which uses both the data pointers in our program. The C51 compiler makes use of at least one data pointer with an interrupt function. When an interrupt function is being compiled by means of using the MODA2 directive, both the data pointers are thus saved on the stack. This happens when interrupt function uses only one data pointer. To save the stack space, e may compile these interrupt functions with the NOMODA2 directive [10].

Keil Microvision: Keil MicroVision is defined as the free software that solves more number of the pain points for a given embedded program developer. This software is said to be an integrated development environment (IDE), which is showing the integration of a text editor to write programs and also a compiler which helps to convert the given source code to hex files too if necessary.

CONCLUSION

The absolute variations between the slowly depleting and correspondingly quickly dropping crash types are those that would also be an important in showing up the corresponding targets. Additional data analyses which also indicates some of the secured improvements that may come up from modal shifts from occurring. When a highly sophisticated statistical techniques that are used to predict the given overall safety performance is based

upon the (a) total fatality trends and (b) the sum impacts of the different fatality trends per individual crash type that is invariably given a measurable discrepancy between the two assumptions.

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