

INTELLIGENT TRAFFIC ROUTE MONITORING AND SECURITY SAFEGUARD IN VEHICLE AUTOMATION

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ABSTRACT

In modern scenario, the vehicle automation plays an vital role , but there are so many drawbacks which leads to fatigue accidents. The main concept is to indicate different routes when a person in traffic, which will save time for person to reach the destination at correct time by using GPS system. It is applicable in safe guarding system such as indication of distance in highways about the adjacent vehicle moving in forward and backward direction and also adjusting the speed automatically according to the distance sensed by the IR sensor. It also does the automatic door opening and alarm signal produced when CO₂ exceeds the limit of AC in a car by using gas sensors.

It is also used in security system. When a car door is opened by using wrong key an alarm is produced and SMS will be sent to the registered mobile number. This system uses PIC micro controller 16F877A to control the entire unit.

INTRODUCTION

Embedded plays a major role in automation. The major drawback in the roads are the traffic, due to more number of vehicles. It can be rectified by choosing the alternative ways. It is difficult to find as manual. For that the sensor is used to calculate the distance at front and back sides of the vehicle. Then by the use of GPS modem different paths to reach the destination is determined. By this the user can choose the shortest path and also the traffic is reduced.

Another drawback is an accident. To prevent the people from accidents speed of vehicle should be reduced. Here distance sensor is used to monitor the vehicle which is going in front of the desired vehicle. It is used to calculate the speed and distance coverage. Then the recorded specifications are displayed in the LCD screen.

By this the user can get rid of driving and drives according to that specification. This system also helps the car from leakage of CO₂ gas from the AC of the car, and also it protects the car from the strangers if they try to smuggle the car by creating an alarm sound and also a SMS will be sent to mobile.

EXISTING SYSTEM

In this system, if a vehicle has met accidents, immediately an alert message with the location coordinates is sent to the Control center. From the control center, a message is sent to the nearby ambulance. Also signal is transmitted to all the signals in between ambulance and vehicle location to provide RF communication between ambulance and traffic section. The vehicle accident observed using vibration sensor and in the control section it is received by the microcontroller and then the nearby ambulance is received from the PC and controller sends the message to the ambulance. The signal to Traffic signal section is transmitted through RF communication. Also if any fire occurs, it is detected using fire sensor and an alarm message is directly sent to the fire station.

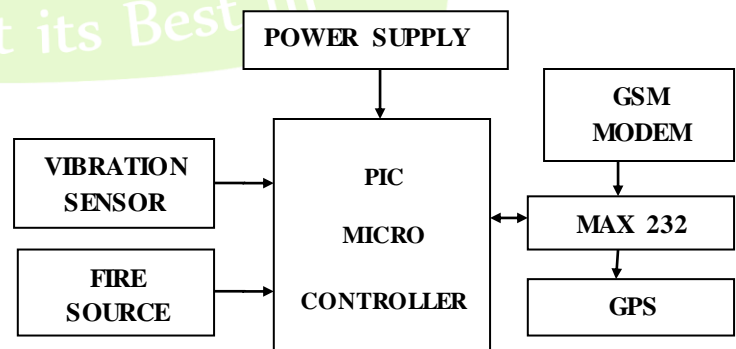


Figure 3.1 Existing system

This system consists of two main units, which coordinates with each other and makes sure that ambulance reaches the hospital without any time lag. Thus this system is divided into following units.

Vehicle unit:

The vehicle unit installed in the vehicle senses the accident and sends the location of the accident to the controller. The vehicle unit consists of a vibration sensor, controller, siren, a user interface, GPS system and a GSM module. The vibration sensor used in the vehicle will continuously sense for any large scale vibration in the vehicle. The sensed data is given to the controller GPS SYSTEM inside the vehicle. The GPS SYSTEM finds out the current position of the vehicle (latitude and the longitude) which is the location of the accident spot and gives that data to the GSM MODULE. The GSM MODULE sends this data to the control unit whose GSM number is already there in the module as an emergency number

Ambulance unit:

The controller finds the nearest ambulance to the accident spot and also the shortest path between the ambulance, accident spot and the nearest hospital. The controller then sends this path to the ambulance. Also using this information the controller controls all the traffic signals in the path of ambulance and makes it ready to provide free path to ambulance, which ensures that the ambulance reaches the hospital without delay. At the same time, the ambulance unit turns ON the RF transmitter. This will lead to communicate with the traffic section.

PROPOSED SYSTEM

In proposed system is going to introduce traffic monitoring system in addition to safeguard system. The main concept is to indicate different routes when a person is in traffic, which will save time for person to reach the destination at correct time by using GPS system. It is applicable in safe guarding system such as indication of distance in highways about the adjacent vehicle moving in forward and backward direction and also adjusting the speed automatically according to the distance sensed by the IR sensor. It also dose the automatic door opening and alarm signal produced when gas exceeds the limit of AC in car by using gas sensors. It is also used in security system. When a car door is opened by using wrong key an alarm is produced and SMS will be sent to the registered mobile number. This system uses PIC micro controller 16F877a to control the entire unit.

4.1 BLOCK EXPLANATION

PIC Microcontroller:

Microcontroller is a 40pin DIP IC 16F877A. It needs 5V power supply. Microcontroller is a general purpose device, which integrates a number of the component of a microprocessor system on a single chip. It has inbuilt CPU, memory and peripherals to make it as a mini computer.

LCD (Liquid Crystal Display):

LCD's are used as numerical indicators, especially in digital watches where it consumes small current than LED display (microamperes compared with mill amperes) prolog battery life. Liquid crystals are organic (carbon) components, which exhibit both solid and liquid properties.

Distance Sensor:

Ultrasonic sensor is used as a distance sensor. It is used to find the distance of the adjacent vehicle. In this there are two ball like structures used to measure the distance of the adjacent vehicle. When a vehicle enters the circumference of the ultrasonic sensor the sensor finds the distance of that vehicle and also the speed of the vehicle.

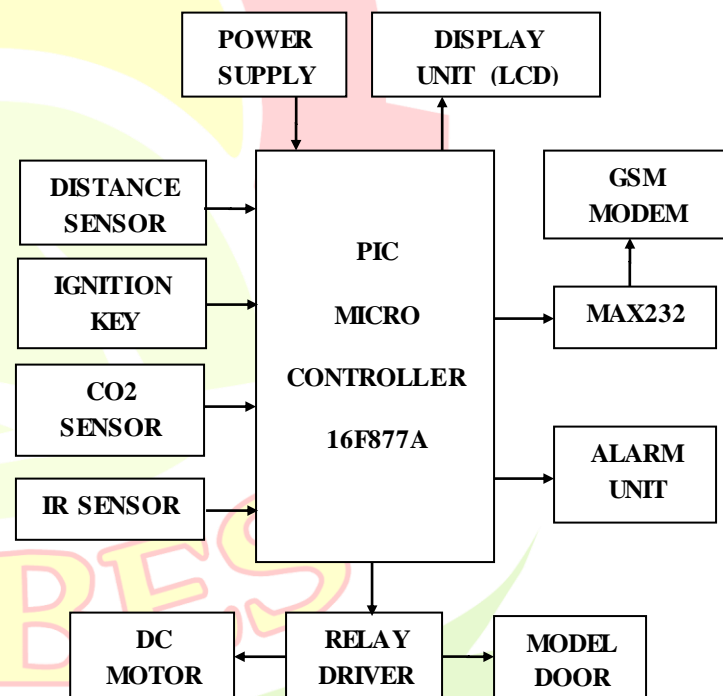


Figure 4.1 Block diagram of proposed method

Ignition Key :

It is used for security safe guarding the vehicle .In this sensor will be fixed in the ignition part of the vehicle, if any wrong key has been injected, an alarm will be produced by the buzzer and also SMS will be sent to the registered mobile number.

CO₂:

Gas sensor is used to detect co₂, if the level of the carbon-di-oxide increases than the level of oxygen, the gas sensor sense it, and passes the information to the controller unit to alarm, and also open the model door.

IR Sensor:

IR sensor it is used to find the density of the vehicle in a particular area, for this IR sensor is used as it will be placed in a particular area.

Relay:

Normally relay is said to be a switch. The electromagnetic relay is used. It consists of five terminals in this the normally open and normally close conditions are used to run the dc motor.

Model Door:

Model door is used when the level of carbon-dioxide increases than the level of the oxygen, At this time the person in the vehicle could die due to the raise of co2 level from the AC, the gas sensor sense the amount of co2 and sends the data to the controller and the controller open the model door with the help of the relay unit.

Alarm Unit:

Alarm unit is used for indicating some of the things such as the increase in carbon-di-oxide level, theft of the car. The buzzer is used as the alarm unit.

MAX 232:

To communicate over UART or USART, the three basic signals are needed, which are namely, RXD (receive), TXD (transmit), GND (common ground). So to interface MAX 232 with microcontroller these signals are needed.

GSM Modem:

A **GSM modem** is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.

When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network

4.2 FEATURES

- High performance RISC CPU.
- There are 35 single word instructions.
- All single cycle instructions except for program branches which are two cycle.
- Operating speed: DC - 20 MHz clock input DC - 200 ns instruction cycle.
- Up to 8K x 14 words of FLASH Program Memory.
- Up to 368 x 8 bytes of Data Memory (RAM).
- Up to 256 x 8 bytes of EEPROM Data Memory.
- Pin out compatible to the PIC16C73B/74B/76/77.
- Interrupt capability (up to 14 sources).
- Direct, indirect and relative addressing modes.
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST).

Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation.

Programmable code protection.

Selectable oscillator options.

Low power, high speed CMOS FLASH/EEPROM technology.

In-Circuit Serial Programming(ICSP) via two pins

4.3 PERIPHERAL FEATURES

Timer0: 8-bit timer/counter with 8-bit prescaler.

Timer1: 16-bit timer/counter with prescaler, can be incremented during sleep via external, Crystal clock.

Timer2: 8-bit timer/counter with 8-bit period register, prescaler and postscaler.

Two Capture, Compare, PWM modules

Capture is 16-bit, max. Resolution is 12.5 ns.

Compare is 16-bit, max. Resolution is 200 ns.

PWM max. Resolution is 10-bit.

10-bit multi-channel Analog-to-Digital converter.

Synchronous Serial Port (SSP) with SPI (Master mode) and I2C (Master/Slave).

Universal Synchronous Asynchronous Receiver Transmitter (USART/SCI) with 9-bit address detection.

Parallel Slave Port (PSP) 8-bits wide,with external RD, WR and CS controls (40/44-pin only) Brown-out detection circuitry for Brown-out Reset (BOR).

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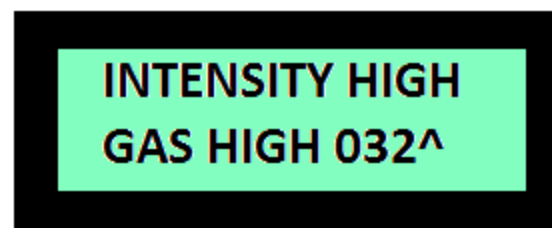
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RESULT:



GAS LEVEL HIGH

