

REAL-TIME VEHICLE ACCIDENT DETECTION AND MESSAGING SYSTEM**#1P.PRABHAKAR, #2V.MAMTHA, #3G.LAVANYA**^{1,2,3}Assistant Professor, Department of ECE, Trinity College of Engineering And Technology, Peddapalli, Telangana.

ABSTRACT: Aid resources are decreasing even as the number of travel-related injuries is on the rise due to technological advancements. In our post, we will provide solutions. Software that monitors acceleration in vehicles can identify risky driving. Both during and after accidents, it can identify collisions and rollovers. A powerful collision signal is received by an accelerometer. In the event of a collision, such as a rollover, a vibration sensor will notify an ATMEGA 8A controller. Authorities and rescuers are notified through GSM alerts sent by the microcontroller. The police can then use the GPS coordinates to locate the location. The following step will be executed upon the verification of the location. In order to save the rescue squad's time, the driver may choose to deactivate the alert message if there are no major injuries or if someone's life is in danger. The accident can be located using a vibration sensor.

Keywords: ARM controller, Accelerometer, Vibration sensor ,GSM module

1. INTRODUCTION

The number of traffic accidents has been on the rise in several places. Nowadays, people die from accidental causes more often than any other. In a national highway accident, it is difficult to help victims without rescue teams and emergency facilities. An autonomous signaling system for car accidents should be implemented, according to our research. Delays could result in fatalities, hence this system is designed to make sure people are safe right after an accident. Consequently, the device can identify the accident instantly and provide the data to the police and emergency network. You can use the car's GPS to find out where the accident happened. The EE PROM's ARM controller keeps track of the appropriate person's cell phone number and notifies them in the case of an accident. There is always a nearby medical facility can be accessed in case of an emergency. Pressing the system's one help button triggers the GPS module to record the exact spot of the car crash, which is then sent via the GSM

modem. If there aren't any major injuries, a system is in place to stop the messages from being sent. It is possible that this approach could shorten the time the rescue mechanism needs. In order to detect accidents, vibration sensors are used. In the case of a traffic accident, this will allow for the better usage of emergency facilities. An accelerometer sensor could be included into a car security system. Thanks to technical developments, this sensor can detect dangerous traffic situations. Accurate vehicle position detection, improved data transfer capabilities, and software independence are essential.

2. EXISTING METHOD

A 3G network and a smart phone can be used to find out where the disaster is happening. A smart phone can be used to call for help or the police office. Another method is the process of getting back stolen cars. Thanks to GSM, the owner of the car is quickly told where it is. The accelerometer is used by the Cr alert app's

automatic vehicle accident recognition and notification system to find drivers who are being careless. The sound sensor can tell what the disaster is. An ARM processor can send a message and store the phone number in EEPROM in case of an accident. GPS is used to find the car, and GSM is used to send the word to the police station and the rescue system.

3. PROPOSED METHOD

There are times when a car that hits another car keeps moving forward after the crash. We came up with a way for the accident monitoring and rescue system to get around these problems. It also comes with Bluetooth on this model. With Bluetooth technology, the information from the damaged car can be sent up to 10 meters away. Information about the car that crashed, like its license plate number and owner, would be sent immediately to other cars so that they could figure out which car hit them. The process of finding the car that caused the accident will be easier for the police.

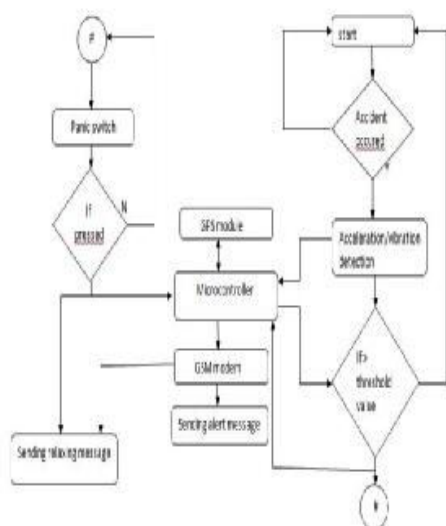


Fig1: The accident alerting system's flowchart.

The sudden drop in speed of the car can be used by the technology to find a collision. The accelerometer constantly checks the

speed of the car and sends information to the microcontroller through an ADC when the speed drops below a certain level. When the controller compares this to a certain level, an SOS message is sent right away to a list of numbers that have already been set. Along with this message, the controller sends the GPS coordinates of the car, which it gets from the GPS module on a regular basis. Significant benefits will come from using this technology to find and free cars that have been involved in accidents.

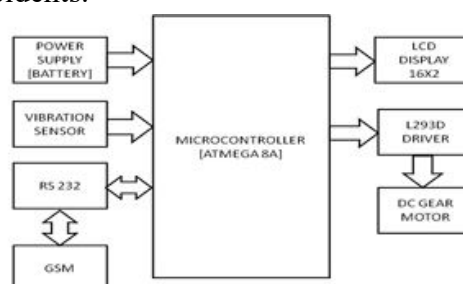


Fig2: Block diagram for accident detection and rescuing

4. METHODOLOGY

Using a GSM and GPS modem, the following steps will be carried out to make a prototype model of an automated vehicle accident monitoring and communications system: A block map will be used to show how the system is set up as a whole. When there is an accident, a piezoelectric sensor tells the computer what happened. GPS uses a vehicle's longitude and latitude to figure out its place. Thanks to the GSM network, the vehicle's latitude and longitude coordinates are sent. The EEPROM already has the phone number saved in it.

Once the exact position of the accident is known, a message is sent to the given phone number.

At mega 8a Microcontroller

Even though there are other microprocessor families out there, the

ATMEGA 8A is used because it can produce a high output with little input. When compared to other devices, the ATMEGA works with voltages between 2.2 and 5.5 volts and needs a lot less input power. A state-of-the-art RISC architecture and nonvolatile memory units are built into it. It can hold up to 130 instructions and has a 16-bit address and an 8-bit data format. At 850 degrees Celsius, the ATMEGA 8A can store data for 20 years, and at 250 degrees, it can store data for 100 years. The extra features include two 8-bit timer/counters with their own pre-scalars and one compare mode. A 16-bit timer/counter that can work in pre-scalar, compare, and record modes. The processor has unique features like Power-on Reset and Programmable Brown-out Detection with an Internally Calibrated RC Oscillator. We offer five different sleep modes: standby, power-saving, rest, ADC noise reduction, and shutdown.

AT MEGA 8A PIN CONFIGURATION

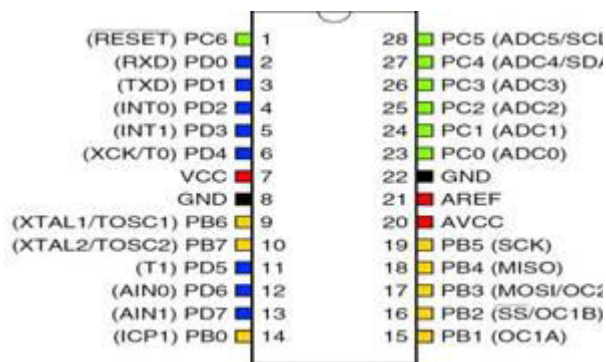


Fig3: PIN settings for the ATMEGA 8A
Gsm Module

The frequency range of the SIM900A Dual Band GSM/GPRS device in the GSM/GPRS Modem-RS232 is from 900 MHz to 1800 MHz. A microcontroller can be linked to a PC and an RS232 processor (MAX232) through the modem's RS232 port. The transmission rate changes from 9600 to 115200 with the AT order.

ATCP/IP framework is built into the GSM/GPRS Modem, which makes GPRS internet access possible. It can be used for many things, like sending info from one M2M device to another, sending SMS messages, and talking on the phone. A number of uncontrolled power sources can be hooked up to the built-in regulated power supply. With the simple AT word, this modem can be used to make voice calls, send and receive SMS, answer incoming calls, connect to the internet, and do many other things.

Power Supply

Transformers are static electromagnets that move electricity from one circuit to another at the same frequency but a different voltage.

Rectifier:

It is the job of the rectifier to change the AC voltage or current to DC voltage or current. In rectifier systems, full wave bridge rectifiers are often used.

The filter's job is to get rid of the AC that is moving. In filter circuits, inductors and capacitors are used. The capacitor's job is to stop AC voltage and block DC voltage. The inductor's job is to stop DC voltage while also stopping AC voltage.

Controller of electricity A voltage regulator is an important part of any electrical system's power supply. The best thing about regulator integrated circuits is that they always produce the same output, even if the input source changes.

Rs232

In contrast to parallel interfacing, serial communications are widely used in the electronics business because they are relatively simple and require less hardware. At the moment, the most common serial messaging standard is the EIA/TIA-232-E specification. For this standard, which was made by the

Electronic Industry Association and the Telecommunications Industry Association (EIA/TIA), the word "RS-232" is often used. A short form of "RS" is "recommended standard." This name was recently changed to "EIA/TIA" to make it easier to find out where the standard came from. "RS-232" is a common term that is used.

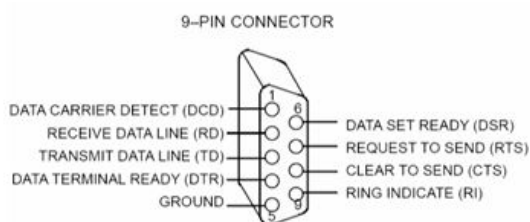


Fig4.DB-9Connector

5. CONCLUSION

This company finds and lets users know about car accidents by sending SMS texts to the cell phone numbers that users have given. In embedded systems, the Tmega 8A MCU is used to build and run the GPS tracking and GSM alert-based method. The suggested Vehicle Accident Detection System can instantly check geographic information and send an SMS message if there is an accident. Extreme care was taken during the trial work. The outcome shows that this effort does, in fact, improve accuracy and awareness. Through an EEPROM interface, the cell phone numbers are stored forever. In turn, this made the project more reliable and useful. It has been shown that the proposed method will help the automotive industry a lot.

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