

Arm7 Based Smart Car Security System

**1.D.Meena PG Scholar, Department of ECE, Nishitha college of engineering & technology,
Lemoor,Kandukur, R.R.Dist, Telangana.**

**2. Mr.CH.Sreedhar, Head of the department;Dept of ECE, Nishitha college of engineering & technology,
Lemoor,Kandukur, R.R.Dist, Telangana.**

ABSTARCT:

The main aim of this project is to offer an advance security system in CAR, which consists of a face detection subsystem, a GPS module, a GSM module and a control platform. The face detection subsystem can detect faces in cars during the period in which nobody should be in the car, and make an alarm loudly or soundlessly. The other modules transmit necessary information to users and help to keep eyes on cars all the time, even when the car is lost. In todays world, many new techniques such as biometric recognition technique, image processing technique, communication technique and so on, have been integrated into car security systems . At the same time, the amount of car lost is also increasing. Traditional car security systems depends on many sensors and cost is also high When one car is lost, no more feedback could be available to help people to find it back. This system prototype is built on the base of one embedded platform ARM7 which controls all the processes. Experimental results

illuminate the validity of this car security system.

INTRODUCTION:

The project aims in designing a completely automated security access system for vehicle security applications. Security is the bigger concern for an individual or a firm. Recognizing the need of security we developed an automated security access system with user friendly access. This Project presents an automotive localization system using GPS and GSM-SMS services. The system permits localization of the automobile and transmitting the position to the owner on his mobile phone as a short message (SMS) at his request. This system is also provided with emergency switch which can be turned off through an SMS. This switch takes the responsibility to turns OFF the engine and can be turned ON only after receiving a predefined password from the owner of the vehicle.

The system can be interconnected with the car alarm system and alert the owner on his mobile phone. This tracking system is composed of a GPS receiver, Raspberry Pi processor and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The Raspberry Pi processor processes this information and this processed information is sent to the user/owner using GSM modem. Raspberry Pi processor also gets the speed of the vehicle and sends it to user/owner.

The presented application is a low cost solution for automobile position and status, very useful in case of car theft situations, for monitoring adolescent drivers by their parents as well as in car tracking system applications. The proposed solution can be used in other types of application, where the information needed is requested rarely and at irregular period of time (when requested).

In case of vehicle theft situations the owner can know the vehicles current location and based on that he can stop the vehicle by sending a predefined SMS message to this system. After receiving SMS message from owner this system automatically stops the ignition system

hence the vehicle will not function any more.

The main features of this project are:

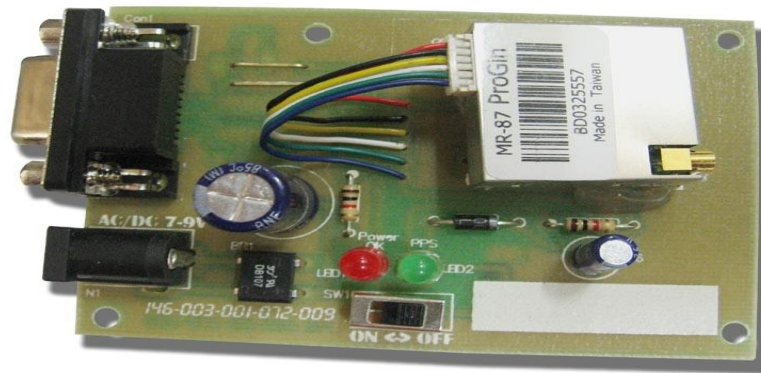
1. Complete automation system.
2. Sensors based input measuring and control.
3. ARM microcontroller based reliable design.
4. Automatic control and alerting through GSM.
5. Live status displays on LCD.
6. Useful for multi industrial automation.
7. Easy to operate and less manpower based design.
8. User friendly operation.
9. Buzzer for audible alerts.

Need For Embedded Systems:

The uses of embedded systems are virtually limitless, because every day new products are introduced to the market that utilizes embedded computers in novel ways. In recent years, hardware such as microprocessors, microcontrollers, and FPGA chips have become much cheaper. So when implementing a new form of control, it's wiser to just buy the generic chip and write your own custom software for it. Producing a custom-made chip to handle a particular task or set of tasks costs

far more time and money. Many embedded computers even come with extensive libraries, so that "writing your own software" becomes a very trivial task indeed. From an implementation viewpoint, there is **GPS(GLOBAL POSITIONING SYSTEM)**

a major difference between a computer and an embedded system. Embedded systems are often required to provide Real-Time response



Basic concept of GPS

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

- the time the message was transmitted
- precise orbital information (the ephemeris)
- the general system health and rough orbits of all GPS satellites (the almanac).

The receiver uses the messages it receives to determine the transit time of each message and computes the distance to each satellite.

These distances along with the satellites' locations are used with the possible aid of trilateration, depending on which algorithm is used, to compute the position of the receiver. This position is then displayed, perhaps with a moving map display or latitude and longitude; elevation information may be included. Many GPS units show derived information such as direction and speed, calculated from position changes.

GSM (Global System for Mobile Communication)

Definition:

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication.

GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile

cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.

RESULT

In this chapter, schematic diagram and interfacing of ARM-7 LPC2148 microcontroller with each module is considered.

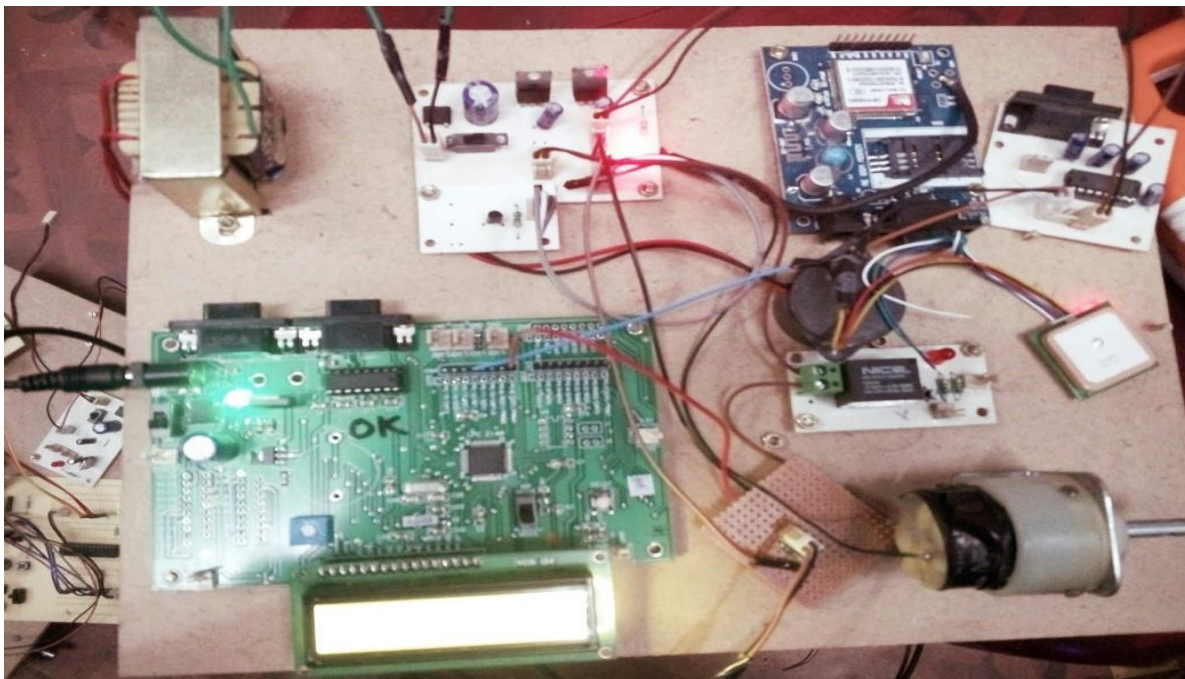
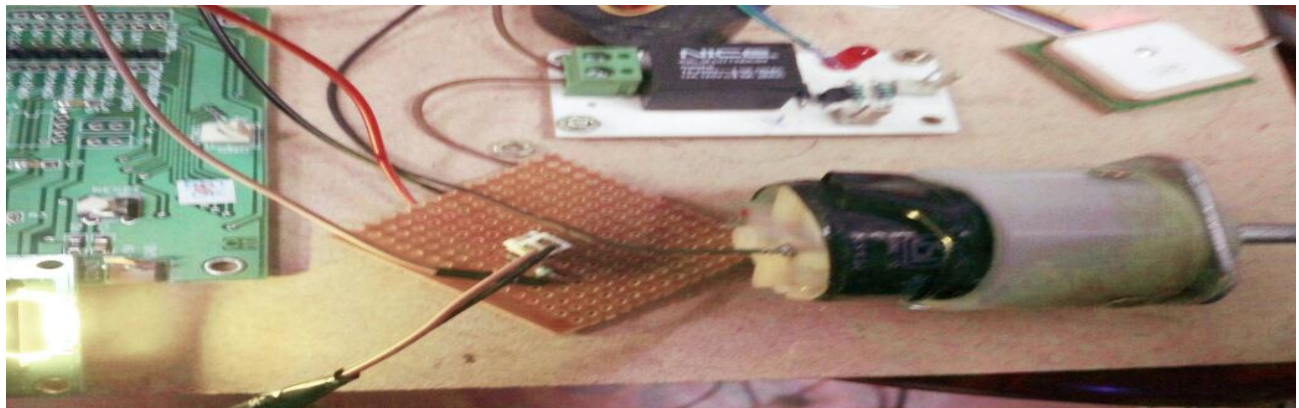
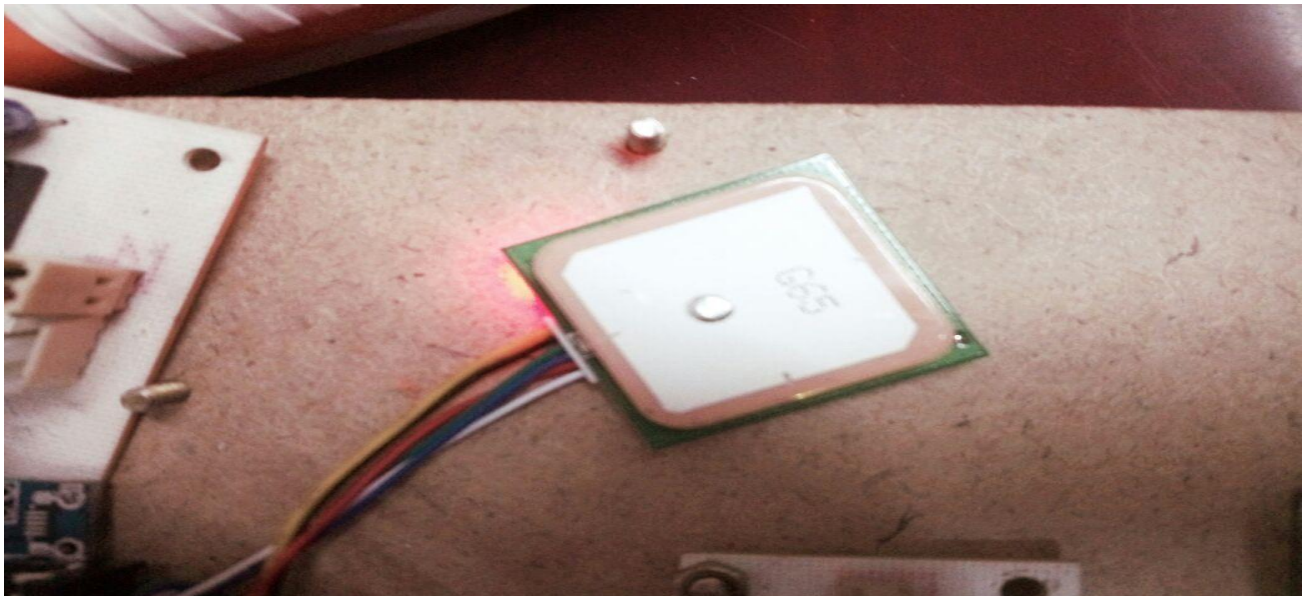


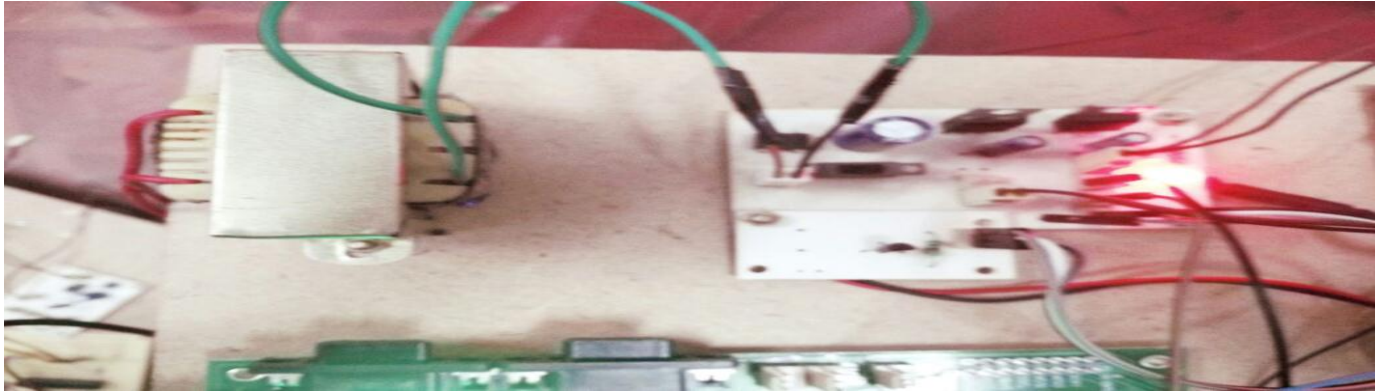
Fig 5.1: schematic diagram of ARM 7 BASED SMART CAR SECURITY SYSTEM



The above schematic diagram of construction of **ARM 7 BASED SMART CAR SECURITY SYSTEM** explains the interfacing section of each component with micro controller Temperature sensor(LM 35),IR sensor, Metal detection sensor, GSM modem, LCD, Relay and buzzer.







**ADVANTAGES AND
DISADVANTAGES & APPLICATION**

Advantages:

1. Complete automation system.
2. Sensors based input measuring and control.
3. ARM microcontroller based reliable design.
4. Automatic control and alerting through GSM.
5. Live status displays on LCD.
6. Useful for multi industrial automation.
7. Easy to operate and less manpower based design.
8. Efficient design and Easy to operate.
9. Eliminates Manual operations.
10. Fast response.

Disadvantages:

1. Periodic monitoring is needed.
2. Careful handling of Sensors is required.

6.2 Applications:

1. All kind of industries and automatic industries like
2. Steel industries/factories.
3. Food making automobile industries.
4. Automobiles like (cars, vans and heavy industry)
5. Small scale spare part design industries.
6. Embedded systems
7. Real time implementa

CONCLUSION & FUTURE SCOPE

Conclusion:

The project “ARM 7 BASED SMART CAR SECURITY SYSTEM” was designed to help for a friendly hardware interaction for the user. The system can be interconnected with the car alarm system and alert the owner on his mobile phone. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The arm7 processes this information and this processed information

is sent to the user/owner using GSM modem. ARM7 also gets the speed of the vehicle and sends it to user/owner

Future Scope:

Our project “ARM 7 BASED SMART CAR SECURITY SYSTEM” is mainly intended to provide an complete industrial automation with the help of multiple sensors, GSM and ARM industrial microcontroller. This system continuously monitoring the sensor data and displays on the LCD,if any sensor activated / detected the ARM microcontroller compared and takes immediate respective action through relays and this alert information send to technician/user through GSM.

This system have temperature sensor,IR obstacle sensor, metal/induction sensor, GSM and ARM microcontroller. This system provides complete industrial automation using these multiple sensor. This project mainly useful for industry like steel industry, if they want to make particular shape of steel metal, they need to monitor the temperature ,size and metal presence by using these three senors,so that we can provide automation for making different kind of metal shapes in steel industry. like that this project can be very useful for many industries and automobiles.

This project can be implemented by adding multiple sensors,wieless communication and high speed microcontroller. So that this system can be useful for making better results and also can observe the operations wirelessly through smart mobile applications via wi-fi communication.

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