

# **“VEHICLE THEFT ALERT & ENGINE LOCK SYSTEM USING ARM7”**

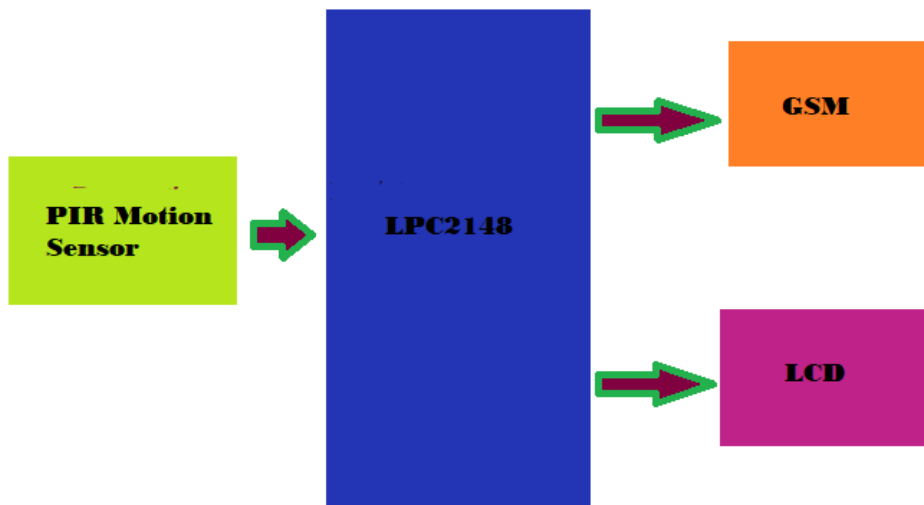
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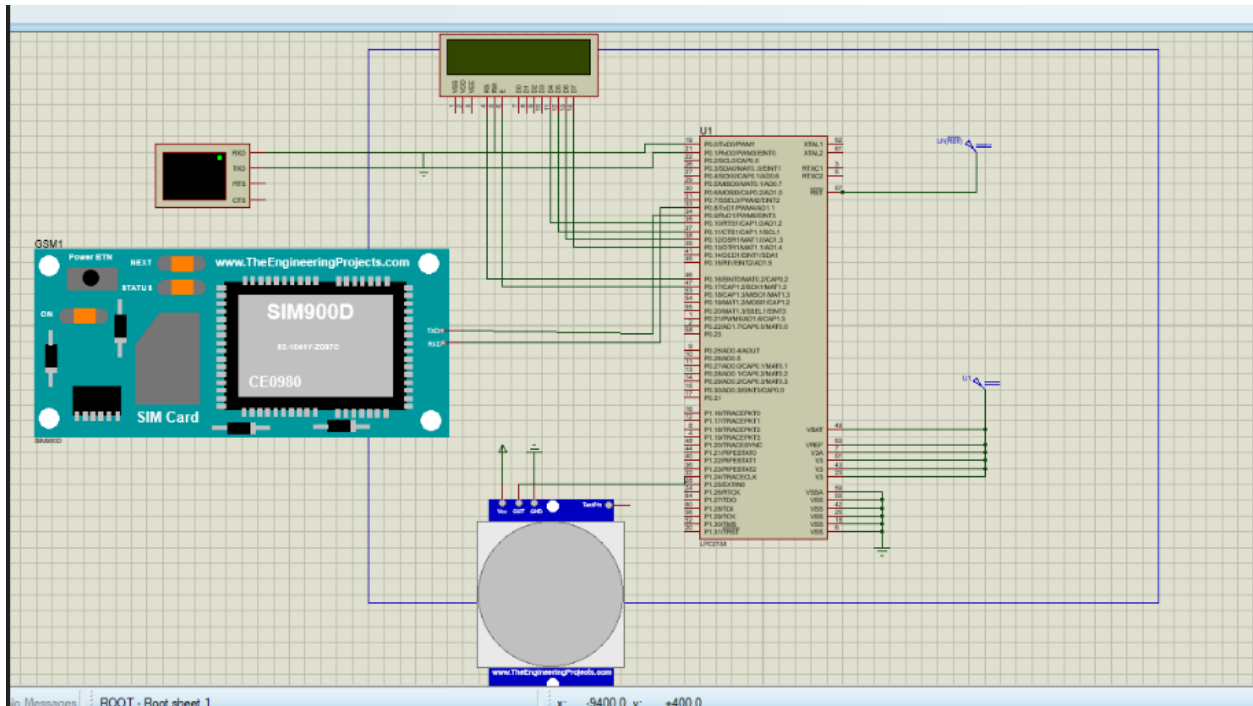
## Introduction:

Vehicle theft has become a major problem that the entire world is facing now. The issue of vehicle theft has increased tremendously, mostly at parks. To stop this issue, there is a need for a theft alert system which helps the owner to ensure theft prevention and provide speedy identification of an unauthorized person who was trying to steal the vehicles. The theft alert system makes use of PIR Motion Sensor which detects the motion of objects and GSM (Global System for Mobile) which is embedded in the vehicle to communicate with the vehicle's owner's mobile phone. By using PIR Motion Sensor, we will detect theft and display the message as "Theft Detection!" on LCD. In GSM technology, the communication is established either by an SMS or calling but we prefer the communication via SMS (between GSM and the owner's mobile phone). The communication established include – Sending of an SMS by GSM to the owner's mobile phone to provide all information about the vehicle and vice-versa. In this system we are going to use two keys to open the vehicle lock, one is the owner's key which is used by the owner and other is the direct key which is used by an unauthorized person. Whenever the direct key is used, the alarm becomes active and gives the beep sound which indicates that the thief is detected. At the same time a warning SMS is sent by GSM to the registered mobile number. After receiving the message, the vehicle's owner sent a message to remotely lock the engine, after turning.

## Block diagram of the system implemented:



## Interfacing of overall system:



## Methodology:

Sensor	Specification	Working
LPC2148	<ul style="list-style-type: none"> <li>LPC2148 is a single-chip 16/32-bit RISC Microcontroller</li> <li>LPC2148 has inbuilt ISP</li> <li>High Performance 32-bit ARM7TDMI-S™ CPU.</li> <li>512 KB Programmable Flash Memory provides a minimum of 10,000 erase/write cycles and 10 years of data-retention.</li> <li>32 KB Data Memory (SRAM)</li> </ul>	Basic building block of our system

Sensor	Specification	Working
PIR sensor	<ul style="list-style-type: none"> <li>• Wide Working Voltage Range: DC 4.5V- 20V.</li> <li>• Current Drain: &lt;60uA.</li> <li>• Detection Angle: &lt;140°</li> <li>• Detection Distance: 3 to 7m (can be adjusted)</li> <li>• Blockade time: 2.5s (Default)</li> <li>• Work temperature: -20-+80°C.</li> </ul>	Pir sensor sense motion, converts in into electrical signal and allows the further execution through gsm module
GSM module	<ul style="list-style-type: none"> <li>• Quad-Band 850/ 900/ 1800/ 1900 MHz.</li> <li>• GPRS multi-slot class 10/8.</li> <li>• GPRS mobile station class B.</li> <li>• Compliant to GSM phase 2/2+ Class 4 (2 W @ 900 MHz) ...</li> <li>• Dimensions: 24x24x3mm.</li> <li>• Weight: 3.4g.</li> <li>• Control via AT commands.</li> <li>• SIM application toolkit.</li> </ul>	Sends messages to jailer about the prisoner escaping from prison

### Why PIR Motion sensor?

We have considered 3 Sensors i.e Vibration Sensor, Fingerprint Sensor and PIR Motion Sensor.

1. **Vibration Sensor:** They are based on the principle of electromechanical energy conversion and primarily measure force, as well as other quantities such as pressure, acceleration, temperature, and strain by converting the acquired data to an electrical charge.
2. **Fingerprint Sensor:** A capacitive fingerprint sensor uses a grid of tiny capacitors that store electricity, which is discharged only at the points where your fingerprint ridges touch. Sometimes these sensors also support swipes or force sensing.
3. **PIR Motion Sensor:** A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. PIR sensors are commonly used in security alarms and

automatic lighting applications. PIR is an electronic sensor which detects the changes in the infrared light across a certain distance and gives out an electrical signal at its output in response to a detected IR signal. When a human being or a relevant IR source moves past a PIR sensor, the radiation cuts into the pair of sensing elements in an alternate manner, triggering the output to generate a pair of ON/OFF or high and low pulses.

As we can see PIR Motion sensor is comparatively better than Vibration sensor and fingerprint sensor, so we have chosen PIR Motion Sensor which can detect the motion of objects without coming in contact with them. They are very easy to install and do not require much wiring.

#### **Algorithm/flowchart:**

1. Start
2. PIR Motion sensor detects changes in radiations  
    If PIR=1  
        Then send an SMS as "Theft Detection!" or make a call to an authorized person through GSM. After which the user is supposed to send back the message. This message gives command to the vehicle to lock the engine.  
    else  
        Car is Safe.
3. end

#### **Advantages:**

1. The main purpose of this project is to prevent vehicle theft.
2. This functionality is achieved by detecting vehicle status in theft mode and by sending an SMS which is generated automatically. This SMS is then sent to the owner of the vehicle. After receiving the message, the vehicle's owner sent a message to remotely lock the engine.
3. PIR Motion Sensor detects motion reliably indoors as well as in day or dark. They are good for electrical applications used in smaller and compact premises.
4. Thus in this way crimes can be reduced.

## **Limitations:**

1. Car alarm techniques are used to prevent car theft with the help of different types of sensors like pressure, tilt and shock & door sensors.
2. PIR sensors sometimes become incapable of detecting a very slow-moving object.
3. These systems however bear some limitations such as high cost, high false-alarm rate, and easy to be disabled.

## **Conclusion:**

1. In our Project, we have proposed a novel method of vehicle tracking and locking systems used to track the theft vehicle by using GSM technology and PIR Motion Sensor.
2. This system puts into the sleeping mode vehicle handled by the owner or authorized persons, otherwise goes to active mode. The mode of operations changed by persons or remotely. When the theft is identified, the responsible people send SMS to the microcontroller, then issue the control signals to stop the engine motor. After that all the doors locked. To open the doors or to restart the engine, an authorized person needs to enter the passwords. In this method, easily track the vehicle place and doors locked.

## **References:**

1. [https://www.academia.edu/63372516/Detection\\_of\\_Automobile\\_Theft\\_and\\_Engine\\_Locking\\_Using\\_Arduino?from\\_sitemaps=true&version=2](https://www.academia.edu/63372516/Detection_of_Automobile_Theft_and_Engine_Locking_Using_Arduino?from_sitemaps=true&version=2)
2. [https://www.researchgate.net/publication/328293746\\_Anti-theft\\_Security\\_System\\_for\\_Vehicles](https://www.researchgate.net/publication/328293746_Anti-theft_Security_System_for_Vehicles)
3. [http://www.ijrset.com/upload/2019/march/117\\_REMOTE\\_RMK.pdf](http://www.ijrset.com/upload/2019/march/117_REMOTE_RMK.pdf)
4. [http://proceeding.conferenceworld.in/BIT\\_30\\_Mar\\_2019/14BvDayVXaGB337.pdf](http://proceeding.conferenceworld.in/BIT_30_Mar_2019/14BvDayVXaGB337.pdf)
5. <https://www.ijrpr.com/uploads/V2ISSUE3/IJRPR289.pdf>