

Theft Intimation for Goods and Vehicle

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Abstract— Consolidating the Global Positioning System i.e. GPS and Global System for Mobile Communication i.e. GSM Technology an Embedded wireless system named Theft Detection of Goods and Vehicle Tracking system is propounded. This is a long distance real time vehicle surveillance and security system. In this system load cell is used to fulfil the critical need of continuous weight monitoring of goods in a vehicle and real time tracking of the vehicle.

Key words: Embedded system, GPS ,GSM, Vehicle, Load cell

I. INTRODUCTION

In this modern and fast pace moving world vehicular tracking system is an urgent technological need to be implemented ensuring our personal and business life security.

Safety and security of a vehicle is a foremost requirement of its owner. Hence, equipping your vehicle with a smart system will ensure full proof mechanism for the vehicle’s safety [1]. This system enhances efficiency of vehicle along with driver by adding more security to the vehicle.

Nowadays in India vehicle tracking system business market are expanded to increase due to growing concern about the real time tracking of the vehicle [2].

Principle of proposed system:

In this smart system we can continuously monitor, manage and control goods and vehicle from any remote place. GPS is used for location finding and GSM technology is used for communicating between vehicle and control center (owner) [5].

The smart system can be divided into two subsystems:

A. Main vehicle security unit:

- Microcontroller is used to control all the tasks.
- To start the vehicle, the user has to enter an authorized password.
- The load cell unit stores the initial weight into the microcontroller.
- Continuous monitoring of load will occur.
- The first subsystem will be active at the time of loading of goods into vehicle. The authorized person has to enter a unique password as soon as the output of load cell will be stored in the internal memory of the controller, it will be helpful while monitoring further load. Without Authentication if tried to draw goods from the vehicle, buzzer will start buzzing with a simultaneous message “An Unauthorized Entry” will be delivered.

B. Recipient unit

Recipient unit is used to get the status updates continuously along with the real time monitoring of vehicle Exact location will be tracked using GPS module. GPS module gives the information regarding the coordinates to the microcontroller and the microcontroller sends the information using GSM Module to the Authorized Number [5].

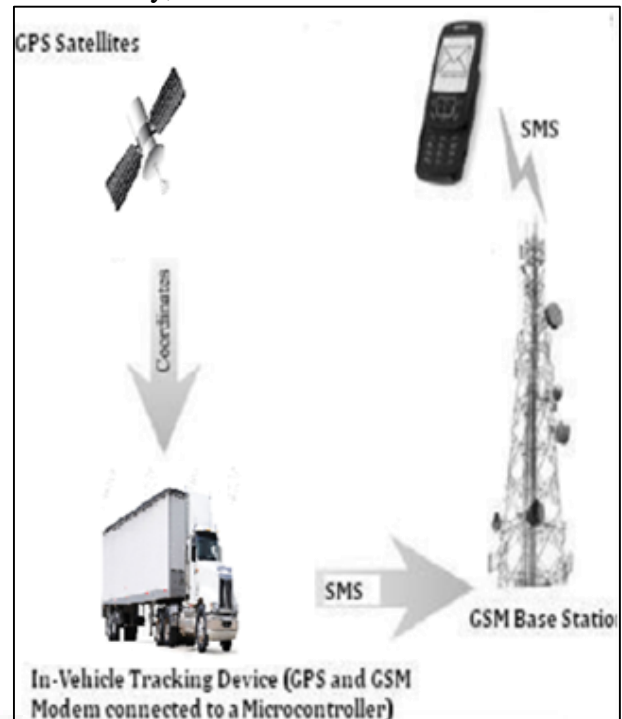


Fig. 1: Recipient Unit

II. SYSTEM ARCHITECTURE

A. Block diagram

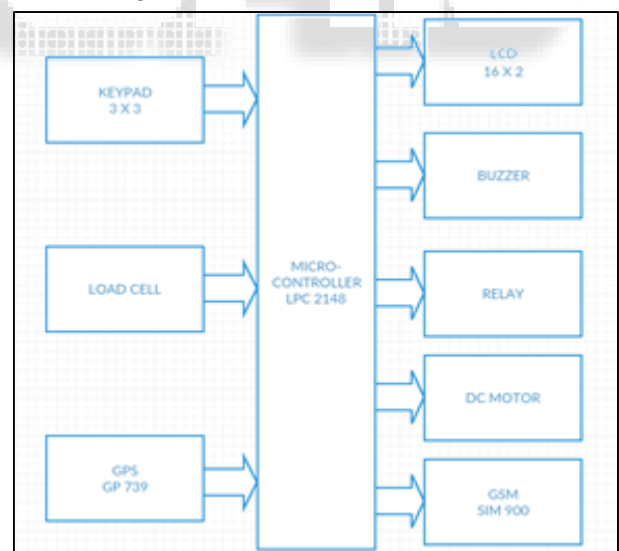


Fig. 2: System Block Diagram

B. Block Diagram Description

1) Microcontroller

Here in our project, controller ARM7 is heart of the system. ARM7 controller is 16/32 bit microcontroller 32kb to 512kb on chip flash memory and 8 kb to 40 kb of chip static RAM. It is RISC processor which consists of 16 bit thumb instruction set. It has single 10 bit ADC to connect sensors. It has power saving modes with ideal and power down mode. Many serial interfaces including 2 UARTs.

2) Load Cell

It continuously monitors the weight of goods and sends its value to microcontroller. If weight exceeds desired value then system alerts to driver. It will continuously give weight readings in voltage format, which is then given to amplifier (i.e. signal conditioning unit) which amplifies the voltage and then given to microcontroller [3].

3) Keypad

The keypad is used to enter the password to start the vehicle and to save the weight of the goods in the microcontroller for the comparison purpose. The microcontroller reads the rows and columns of the keypad and matches the password. If the driver has to insert the correct pin to start the Vehicle, if he/she is unable to enter the pin he/she will get chance of Reentering the pin correctly three times else the Buzzer will start Buzzing and simultaneously the message "An Unauthorized Password" [6].

4) GSM and GPS

The global positioning system continuously monitors the coordinates by using satellites. It is space based navigation system provides location and time information. This unit sends the information about the coordinates to microcontroller. μC stores information about the coordinates in its RAM. Then after specific time μC sends this information with the help of GSM modem using AT commands and connects to the owner [5].

5) Ignition System

In this system we are using one relay as a switch to control ignition of the system by using keypad (Password). If there is wrong entry of password on keypad then relay will act as closed/off switch and on correct password relay i.e. Switch gets on and DC motor starts rotating [4].

6) LCD

LCD module is used to display the operation performed by the microcontroller i.e. to display weights of goods etc.

III. ALGORITHM

- Start
- Sense parameters from various parts of vehicle.
- Enter PIN.
- Send data to the ARM 7.
- If entered PIN is correct then store the value of load cell to RAM.
- Start vehicle.
- If load is varying without authentication, then stop ignition system.
- Send information to owner.
- If PIN is incorrect then go to step 4
- If incorrect PIN is entered three times, then play buzzer and display unauthorized entry.
- Display all data on LCD.
- End

IV. FLOWCHART

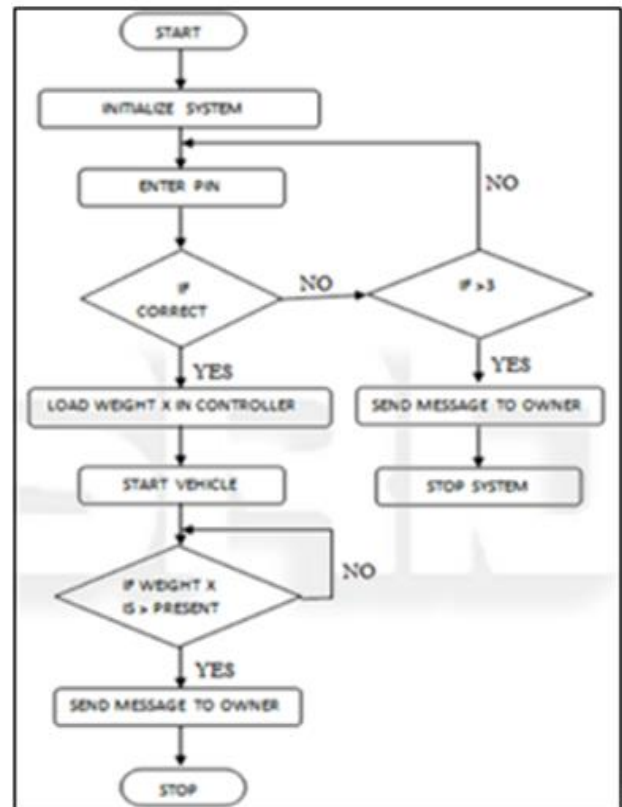


Fig. 3: Flow chart of system working

V. APPLICATIONS

A. Transportation Companies

Transportation company has to deliver the goods to the consumers, if the goods are stolen then the transportation company has to pay for that product. And if the vehicle is stolen then there is a big loss to the company for that the purpose the GPS and the load cell is used.

B. Military Application

Military vehicles carry ammunition from one place to other for e.g. like in Kashmir military vehicles can be allotted with car black box so that if militants attack or damage the vehicle, immediate SMS will be sent to military base station and this ammunitions can be saved from wrong hands.

VI. ADVANTAGES AND DISADVANTAGES

A. Advantages

- Security of vehicle.
- Record driving data, goods weight data and position data.
- Analyze the accidents detail.
- Send location of vehicle through GPS & GSM technique.
- Remote place data can be acquiescing.
- Data acquiesced is placed on internet.
- Due data present on internet can be acquiesced at any time.

B. Disadvantages

- Damage of sensor cannot be detected.

VII. FUTURE SCOPE AND CONCLUSION

A. Future Scope

- A Front and rear Cameras can be used for Lane tracking and security purpose.
- Ultrasonic sensors can be used in front to avoid collision
- A Camera can be used inside the car for vigilance purpose and thief can be identified and captured easily
- We can use CPLD chips instead of μC . since it has more features than future μC .
- In this system can be modified for accident detection and its avoidance by using Accelerometer and additional sensors.
- Along with password protection if thumb recognition and face recognition is used then security against theft can be improved.

VIII. CONCLUSION

An efficient solution for continuously tracking and anti-theft system is proposed in this paper. Goods are prevented from thefts using Load Cell Monitoring and GPS-GSM Module reports burglary and receives real-time vehicle location and sends it to Authorized person via SMS.

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