



GSM AND GPS BASED SMART SYSTEM IN HEAVY DUTY VEHICLES

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ABSTRACT

Detection and monitoring of heavy duty vehicles are continue to emerge now-a-days. This paper is about load sensing, fuel and drunk & drive detection. The load cell which detects both load and fuel is used so that excess load during export without the knowledge of proprietor and fuel theft can be avoided. The purpose of this project is to reduce the economic loss to the proprietor. In addition to this, the behavior of the driver whether the person is drunk can also be sensed using sensors. This prevents the occurrence of accidents. The exact location of the vehicle can be identified by using Global Positioning System (GPS) and Global System for Mobile Communication (GSM). This is more reliable and low cost.

KEYWORDS: Load cell, Alcohol sensor, GSM, GPS.

1. INTRODUCTION

Generally, during the export and import of goods, the load can be weighed only at the source and destination. So due to this reason drivers are adding additional load in the midway without the knowledge of the owner. This decreases the durability of tyres. If load increases in the vehicle then fuel consumption also increases. In addition to that economic loss also occurs due to Fuel theft in vehicles. In this proposed system, load can be monitored continuously by using GSM and the monitored information is sent to the authorized person. Currently GPS vehicle tracking ensures their safety as travelling. This vehicle tracking system found in clients vehicle as a theft prevention and rescue device. Using GPS system the position of the vehicle can be tracked easily. This system also includes the detection of Alcohol consumption by the driver using Alcohol sensor.

2. EXISTING SYSTEM

Generally, detection of fuel and drunk & drive detection in heavy duty vehicles is possible with the help of Level detector and Alcohol sensor respectively [8]. In the existing system, load can be detected only at the sending and receiving end.

DRAWBACKS

Load cannot be continuously sensed. Fuel consumption increases as load increases. Wear and tear of tyres increases, which leads to increase in maintenance cost.

3. PROPOSED SYSTEM

In this proposed work, the load monitoring can be done continuously and the information about the location and load is sent to the proprietor by means of GPS and GSM. For load detection, the sensor named as Load cell is used. The Fuel level can also be measured by using Load cell throughout the transportation. Therefore, the theft of fuel can be identified by the proprietor easily [3]. In addition to this, Alcohol sensor is also used which is used to detect whether the drive is drunk.

ADVANTAGES

- Without the knowledge of proprietor, the load cannot be added by the driver in the midway during transportation.
- Fuel theft can be detected easily.
- The vehicle monitoring can be done completely by the proprietor during transportation of goods.

4. BLOCK DIAGRAM

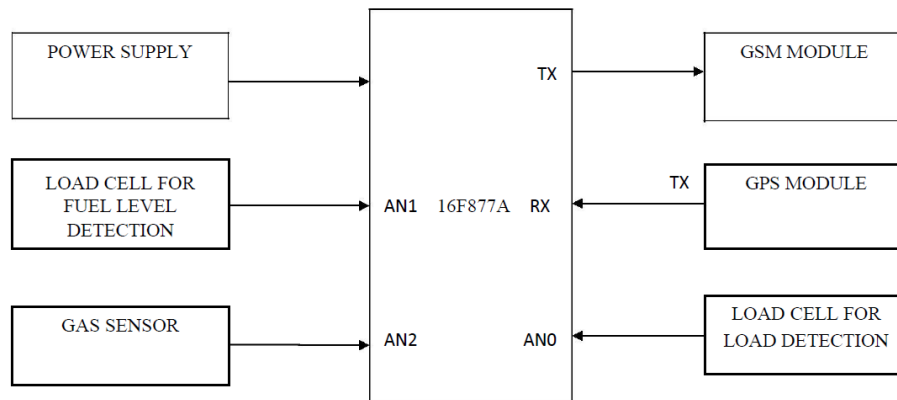


Fig 4.1 BLOCK DIAGRAM OF PROPOSED SYSTEM

While breathing, the gas sensor detects the alcohol concentration [4]. It is just similar to the breath analyzer. The sensor produces an analog resistive output based on alcohol concentration [5]. Then the output of the gas sensor is fed to the PIC microcontroller which has inbuilt ADC so that the analog input is converted into digital form which is displayed with the help of LCD attached to the PIC microcontroller.

Load cell [1] is a sensor or transducer which converts load or force into some electrical signal. When the force is exerted on the strain gauge type load cell, the change in resistance occurs at one of the resistor [2]. This change in resistance results in a change in output voltage. This small change in output voltage can be measured (usually in millivolts range) and is amplified with the help of booster circuit which is then given to the PIC Microcontroller. Finally the output is displayed in the LCD.

With the help of GSM technology, the mobile and the PIC Microcontroller communicate over the network. SIM800C GSM module is used here which supports

850/900/1800/1900MHz. The SMS and the data information can be sent with low power consumption by using SIM800C. Because of its tiny size, it can be fit into slim and compact design. The information about load, fuel and alcohol consumption by the driver can be sent to the proprietor by using this module [9].

GPS satellite transmits the location information to the GPS receiver [7]. All the GPS satellites should be synchronized. The location of the vehicle can be found by estimating the time taken by the signals to reach the GPS receiver from the GPS satellites. LS20030 GPS module is used which includes embedded antenna and GPS receiver circuits. The exact location of the vehicle in terms of longitude and latitude can be sent to the proprietor with the help of GPS [10]. The hardware setup is shown in Figure 4.2

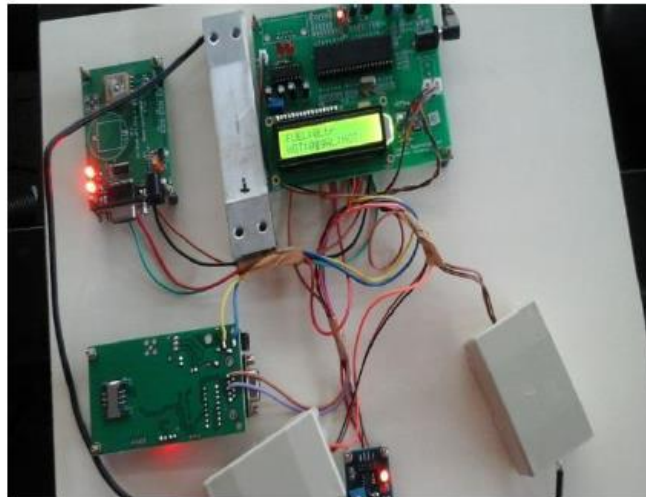


Figure 4.2 HARDWARE SETUP

5. RESULTS

Gas Sensor senses whether the person is drunk. If YES, the result will be DETECTED otherwise NOT DETECTED. The other parameter results are shown in TABLE 1.

TABLE 1

Condition	<1	=1	>1
Load(kg)	Load Reduced	Normal	Load Added
Fuel Level(Litres)	Fuel Reduced	Normal	Fuel Added

6. CONCLUSION

In this proposed paper, the load and the fuel level can be continuously monitored along with drunk and drive detection instead of measuring load at the source and destination using

weighing bridge. Then the information about the load can be sent to the proprietor with the help of GPS and GSM technology. Hence the driver cannot cheat the proprietor by adding excess load inbetween source and destination and in the sameway fuel theft can also be avoided. This reduces the fuel consumption and wear and tear of tyres which inturn reduces the economic loss to the proprietor.

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