Goods Vehicle Tracker and Theft Detection with Fire Fighting System Using IOT

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Abstract--

In Supply Chain Management the transportation of perishable Goods carrying from one region to another region effectively plays a vital role in the sustainability of the entire process of manufacturing the Industrial Machines. The Vehicle Tracking System has the capability of finding the Vehicle location, Gas Leakages, Fire Detection and Vehicle Accident and at the same time notifies the owners of the vehicle through a GSM network with an SMS alert message. We converts the silent profile of phone into general mode and starts announcing about the disaster happened in the goods carrying vehicle such as Fire detection , Accident if occurred and Alerts to owner if any Goods theft Occurred. The main aim is to design a low cost and an efficient vehicle tracking and vehicle security circuit based on an SST(Silicon Storage Technology) microcontroller. This system can be made as a backup sector inside the vehicles to prevent them from stolen and easy to identify the location and prevent from other disaster factors. The main methodology of the device is to monitoring the Vehicle Movements, Fire detection and immediate responding With Goods Theft Detection System through Internet of things.

Keywords-- Vehicle Tracking, Locking, pressure Sensor, Microcontroller, GPS, GSM, Real-Time Visibility

I. INTRODUCTION

Vehicle tracking systems were first implemented for the shipping industry because people wanted to know where each vehicle was at any given time, automated vehicle tracking system is being used in a variety of ways to track and display vehicle locations in real-time. This paper proposes a vehicle tracking system using GPS/GSM/GPRS technology and a Smartphone application to provide better service and cost effective solution for users to track vehicle and goods.In our project we developed a Smartphone application along with the in-vehicle tracking device. The goods theft can be detected and an automatic water sprinkling system is turned ON whenever there is fire detection in the vehicle and for every event the message is sent the owner .The 2 parts work together to offer the most convenience to the users as they become handy to track vehicle locations in real-time. With goods anti theft detection and an automatic fire extinguisher system

II. SURVEY OF THE RELATED WORK

- The hardware and software of the GPS and GSM network were developed. The proposed GPS/GSM based System has the two parts, first is a mobile unit and another is controlling station. The system processes, interfaces, connections, data transmission and reception of data among the mobile unit and control stations are working successfully. These results are compatible with GPS technologies.

- A vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to track the vehicle's place. This paper proposed to design a vehicle tracking system that works using GPS and GSM technology. This system built based on embedded system, used for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously watch a moving Vehicle and report the status of the Vehicle on demand.

- A **pressure sensor** is a device for pressure measurement of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.

- **Firefighting** is the act of attempting to prevent the spread of and extinguish significant unwanted fires in buildings, vehicles, woodlands, etc.
  A firefighter suppresses fires to protect lives, property and the environment
  Fire detection , Accident if occurred and Alerts to owner if any Goods theft Occurred

- **Fire Sensor** The Fire sensor is used to detect fire flames . The module makes use of Fire sensor and comparator to detect fire up to a range of 1 meters.

- **Gas Sensor** The liquefied Petroleum Gas (LPG) sensor is suitable for sensing LPG (composed of mostly propane and butane) concentration in the air. This can be used in Gas Leakage Detection equipment for detecting the ISO-butane, Propane, LNG combustible Gases. If output goes above the preset range, indication will be shown as high otherwise it will remain in idle condition.

III. PROPOSED METHOD

In this proposed work, a novel method of Goods Vehicle Tracker and Theft Detection With Fire Fighting System used to track the theft vehicle by using GPS and GSM technology. And capability of finding the Vehicle location, Gas Leakages, Fire Detection and Vehicle Accident and at the same time notifies the owners of the vehicle through a GSM network with an SMS alert message. We converts thesilent profile of phone into general mode and starts announcing about the disaster happened in the goods carrying vehicle such as Fire detection , Accident if occurred and Alerts to owner if any Goods theft Occurred . The drivers require their presence to their family or to their respective one's

## IV. BLOCK DIAGRAM
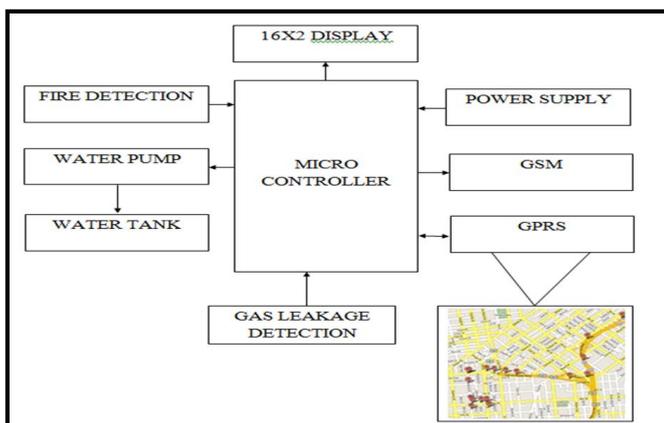
GPS Technology

The Global Positioning System (GPS) is a satellite-based navigation system consists of a network of 24 satellites located into orbit. The system provides essential information to military, civil and commercial users around the world and which is freely accessible to anyone with a GPS receiver. GPS works in any weather circumstances at anywhere in the world. Normally no subscription fees or system charges to utilize GPS. A GPS receiver must be locked on to the signal of at least three satellites to estimate 2D position (latitude and longitude) and track movement. With four or more satellites in sight, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the vehicle position has been determined, the GPS unit can determine other information like, speed, distance to destination, time and other. GPS receiver is used for this research work to detect the vehicle location and provide information to responsible person through GSM technology.

GSM Modem SIM300 V7.03

The GSM modem is a specialized type of modem which accepts a SIM card operates on a subscriber's mobile number over a network, just like a cellular phone. It is a cell phone without display. Modem sim300 is a triband GSM/GPRS engine that works on EGSM900MHz, DCS1800MHz and PCS1900MHz frequencies.GSM Modem is RS232-logic level compatible, i.e., it takes-3v to -15v as logic high and +3v to +15 as logic low.MAX232 is used to convert TTL into RS232 logic level converter used between the microcontroller and the GSM board. The signal at pin 11 of the microcontroller is sent to the GSM modem through pin 11 of max232.this signal is received at pin2 (RX) of the GSM modem. The GSM modem

transmits the signal from pin3 (TX) to the microcontroller through MAX232, which is received at pin 10 of IC1

Features of GSM

Single supply voltage 3.2v-4.5v

Typical power consumption in SLEEP Mode: 2.5mA.

SIM300 tri-band

Supported SIM Card :1.8V,3V

Water pump
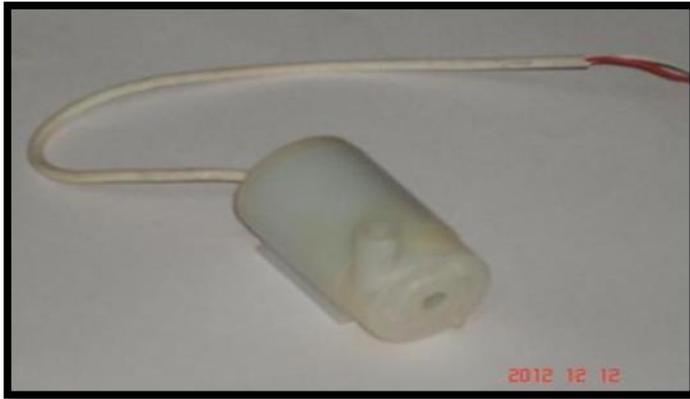
This is lightweight, small size, high efficiency, low consumption and low noise water pump.It has been used widely, in household include cooking, cleaning, bathing, space heating and water flowers, etc.
Note: Please do not test long time with no-load, inside is with plastic leaves, can't suction impurity.

FEATURE:

1. self-priming pump
2. Optimal For Voltage: 6V
3. **Specification :**
4. Working Voltage: 4v-12V
5. Working Current: 0.8A
6. Motor Diameter: 27mm
7. Water Pump lenght: 52mm
8. Drain Hole: 4mm
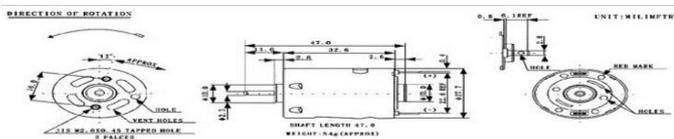
Debugging and Testing Process

A microcontroller-based system is a complex activity that involves hardware and software interfacing with the external world. Doing well design of a microcontroller-based system requires skills to use the variety of debugging and testing tools available. The debugging and testing of microcontroller-based systems divided into two groups: software-only tools and software-hardware tools. Software-only tools come as monitors and simulators, which are independent of the hardware under development. Software-hardware tools are usually hardware dependent, more expensive and range from in-circuit emulators and in-circuit simulators to in-circuit debuggers. In general, the higher the level of integration with the target hardware, the greater the benefit of a tool, resulting in a shorter development time, but the greater the cost as well. The factors to consider when choosing a debugging tool are cost, ease of use and the features offered during the debugging process.

A software simulator is a computer program running on an independent hardware and it simulates the CPU, the instruction set and the I/O of the target microcontroller. Simulators offer the lowest-cost development tools for microcontroller-based systems and most companies offer their simulator programs free of charge.

The user program operated in a simulated environment where the user can insert breakpoints within the code to stop the code and then analyze the internal registers and memory, display and change the values of program variables and so on. Incorrect logic or errors in computations can analyze by stepping through the code in simulation. Simulators run at speeds 100 to 1000 times slower than the actual micro controller hardware and, thus, long time delays should avoid when simulating a program. Micro controller-based systems usually have interfaces to various external devices such as motors, I/O ports, timers, A/D converters, displays, push buttons, sensors and signal generators, which are usually difficult to simulate. Some advanced simulators, such as the Proteus from Labcenter Electronics allow the simulation of various peripheral devices such as motors, LCDs, 7-segment displays and keyboards, and users can create new peripheral devices. Inputs to the simulator can come from files that may store complex digital I/O signals and waveforms. Outputs can be as form of digital data or waveforms, usually stored in a file, or displayed on a screen. Some simulators accept only the assembly language of the target microcontroller. Most of the microcontroller software has written a high-level language such as C, Pascal or Basic, and it has become necessary to simulate a program has written in a high-level language.

The software program has written in c or assembly language and compiled using Keil software. After compiler operation, the hex code generated and stored in the computer. The hex code of the program should be loaded into the AT89C52 by using Top win Universal programmer.

V. ADVANTAGES

1. LOW COST
2. THIS SYSTEM CAN SAVE HUMAN LIVES
3. THIS SYSTEM CAN BE USED FOR THEFT DETECTION
4. PORTABLE
5. THIS SYSTEM CAN BE USED TO DETECT FIRE AT DIFFERENT PLACES
6. RELIABLE

VI. HARDWARE SPECIFICATION

1. Micro Controller-P89v51rd2
2. 16x2 Display
3. Fire Detector
4. Gas Leakage Detector
5. Water Pump

VII. SOFTWARE SPECIFICATION

1. Kiel Micro Vision 4
2. Embedded ' C'
3. Flash Magic
4. 5v Power Supply Board
5. 7805 Voltage Regulator
6. GSM Module
7. Power Supply
8. Pressure Sensors
9. Android SDK
10. Eclipse

VIII. CONCLUSION

This paper offers a smart design of tracking and monitoring the vehicles which helps the companies to provide high quality of service. This design can provide the location of the vehicles and goods of the service with an error less than 10m in the case of slow speed and clear environment and the system give the accurate arrival vehicle and provide the location of the vehicle and goods in Google map for both user and administrator. This system reduces the confusion for waiting to the vehicle of remote users for getting goods on time with proper security if any fire extinguish system is added and provides vehicle and goods tracking at any location, management and fire monitoring is done.

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