Vehicle Theft Alarm And Tracking The Location Using RFID & GPS

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Abstract—GPS is the most important technology for tracking the location of the vehicle. By using this, we can easily identify the location in which it is available. Nowadays, RFID is used in many applications such as a toll gate system, Automatic fuel filling in petrol bunk, Railways inquiry center. Security is the most important thing that everyone is expecting in their basic needs which is to be fulfilled. To achieve that, Vehicle theft alarm and tracking the location using GPS and RFID is implemented. In this technique, both security and tracking the vehicle is done. ATMEGA 162v is the low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. A buzzer is used to indicate the vehicle and give the alert to the authenticated user. GSM is used for mobile communication and also for the alert message.

Keywords—Auto-guard; Buzzer, GPS, RFID.

I. INTRODUCTION

With the rapid development of national economy, automobiles have increased greatly as the human's important vehicles. However, it is the development of modern technology that makes the commit means of crimes become smarter and the automobiles stolen events more frequently. Electronic anti-theft is the most widely used among all the appliances at the moment. But the chip is ATMEGA162V and the network one is the developing directions of the auto-guard technology. RFID Radio Frequency Identification technology which is passive contactless, security and convenient identifies objectives automatically and gets the data through the radio frequency signals. It meets the need of the intellectualized guarding perfectly.

1.1 Intelligent Transportation System (ITS)

It ensures the information transmission so real time, secure reliability reliable that realizes the long distance control. This paper is about a design of a new fashion auto-guard which is a smart measurement generalized in the automobile security area. Number of cars on roads, streets and parking places is constantly increasing. It leads to increased traffic load and accidents.
1.3 Short Message Service (SMS)

The mobile terminal sends data through SMS to the receiving terminal, compare to the modem solution the SMS solution is more economical because the tracking system will work in an emergency cases only (when really the child needs the succoring and help), i.e. to overcome the time of tracking systems in general, which are used to maintain long time continual tracking system it would therefore, result again in a high cost in maintaining a continual tracking system.

II. POWER SUPPLY

Microcontroller unit need 5V DC supply as the operating voltage for the microcontroller unit, GSM modem and GPS module. A 230V AC voltage from a transformer is converted into 12V DC voltage using a power regulator.

i. Transformer
ii. Rectifier
iii. IC regulator

2.1 Transformer

The ac voltage, typically 220V RMS, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op-amp. The advantages of using a precision rectifier are it will give a peak voltage output as DC, the rest of the circuits will give only RMS output.

2.2 Bridge Rectifier

When four diodes are connected as the circuit is called as a bridge rectifier. The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners. The transformer is working properly and there is a positive potential, at point A and a negative potential at point B. The positive potential at point A will forward bias D3 and reverse bias D4. The negative potential at point B will forward bias D1 and reverse D2. At this time the D3 and D1 are forward biased and will allow current flow to pass through them; D4 and D2 are reverse biased and will block current flow. The path for current flow is from point B through D1, up through RL, through D3, through the secondary of the transformer back to point B. This path is indicated by the solid arrows.

D1 and D3. One-half cycle later the polarity across the secondary of the transformer reverse, forward biasing D2 and D4 and reverse biasing D1 and D3. The current flow will now be from point A through D4, up through RL, through D2, through the secondary of T1, and back to point A.

This path is indicated by the broken arrows. The current flow through RL is always in the same direction. In flowing through RL this current develops a voltage. Since current flows through the load (RL) during both half cycles of the applied voltage, this bridge rectifier is a full-wave rectifier.

2.3 IC Regulator

Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for referral source, comparator amplifier, control device, and overload protection all in a single IC. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustable set voltage. The regulators can be selected for operation with load currents from hundreds of Milli amperes to tens of amperes, corresponding to power ratings from milliwatts to tens of watts.

III. BUZZER

A buzzer is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. LL without the metal gong (which makes the ringing noise).
IV. KEYPAD

A numeric keypad, or numpad for short, is the small, palm-sized, seventeen key section of a computer keyboard, usually on the very far right. The numeric keypad features digits 0 to 9, edition (+), subtraction (-), multiplication (*) and division (/) symbols, a decimal point (.) and NUM Lock and Enter keys. Laptop keyboards often do not have a numbered, but may provide numpad input by holding a modifier key (typically labeled “Fn”) and operating keys on the standard keyboard.

V. RELAY

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have to switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit.

There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical. The relay switches connections are usually labeled COM, NC and NO:
1. COM = Common, always connect to this, it is the moving part of the switch.
2. NC = Normally Closed, COM is connected to this when the relay coil is off.
3. NO = Normally Open, COM is connected to this when the relay coil is on.

5.1 Circuit description

This circuit is designed to control the load. The load may be motor or any other load. The load is turned ON and OFF through a relay. The relay ON and OFF is controlled by the pair of switching transistors (BC 547). The relay is connected to the Q2 transistor collector terminal. A Relay is nothing but an electromagnetic switching device which consists of three pins. They are Common, Normally close (NC) and normally open (NO).

VI. RFID

Radio Frequency Identification (RFID) systems use radio frequency to identify, locate and track people, assets, and animals. Passive RFID systems are composed of three components an interrogator (reader), a passive tag, and a host computer. This RF signal is called a carrier signal.

When the RF field passes through an antenna coil, there is an AC voltage generated across the coil. This voltage is rectified to supply power to the tag. The information stored in the tag is transmitted back to the reader. This is often called backscattering. By detecting the backscattering signal, the information stored in the tag can be fully identified.

VII. GSM TECHNOLOGY

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. GSM (Global system for mobile) uses a process called circuit switching. This method of communication allows a path to be established between two devices. Once the two devices are connected, a constant stream of digital data is relayed. GSM networks consist of thee major systems the Switching System (SS), The Base Station(BSS) and the Mobile station(MS). A garage offers a very special package to their customers. Based on the mechanics knowledge and the given vehicle, tailored service intervals can be specified. A part of the service agreement is installation of a GSM modem in the vehicle. An onboard service application can then notify the garage when the vehicle approaches its service interval. The garage will schedule an appointment and inform the customer. The protocol used by GSM modems for setup and control is based on the Hayes AT-Command set. The GSM modem specific commands are adapted to the services offered by a GSM modem such as: text messaging, calling a given Phone number, deleting memory locations etc. Since the main objective for this application note is to show how to send and receive text messages, only a subset of the AT-Command set needs to be implemented.

Setup modem for new message indication.
- Send SMS messages containing user-defined text.
- Mechanism for identification of new message received.
- Read SMS message from a given memory location.

VIII. GPS

GPS, vehicle tracking and navigational systems have brought this technology into the day-to-day life of the common man. Today GPS fitted cars; ambulances, fleets and police vehicles are common sights on the roads of developed countries.
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Fig 8.1 GPS based Vehicle Tracking System

Today GPS fitted cars; ambulances, fleets and police vehicles are common sights on the roads of developed countries. Known by many names such as Automatic Vehicle Locating System (AVLS), Vehicle Tracking and Information System (VTIS), Mobile Asset Management System (MAMS).

IX. RESULTS & DISCUSSION

The System consists of a microcontroller circuit board, keypad, alarm system and a display board. The password is given using a keypad and displayed on the display board in the decrypted form. If the given password does not match with the original password, then the alarm sound will be heard and message (location of vehicle) send to the authorized person with the help of GSM module. Thus the unauthorized person uses the system then GPS will track the region of particular latitude and longitude and GSM will send message to the mobile.

X. CONCLUSION

The auto-guard system combines the advantages of RFID and GSM together. The key of the automobile is an RFID card which is contactless, security and convenient. The long-range monitor and grading responses could be realized by the mobile phones of users, which made the alarm cover a broad range. The microcontroller for the vehicle was adopted which enhanced the reliability and the capability of anti interference. These advantages mentioned above meet the requirements of auto-guard system so that a better effect was made in practice. In addition, it is easy to extend functions. If the function of position tracking is needed, the GPS module can be added. If the Internet of Things is to be entered we only need to rewrite the shaft.

As a result, the radio technology at present can be replaced completely. So the practical value and the market prospect are considerable.

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