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GPS and GSM Based Engine Locking System Using Smart Password

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Abstract

The smart engine locking device is an embedded system based intrusion detection gadget designed and implemented to forestall unauthorized get entry to of vehicles while parking in insecure places. The proposed machine contains a micro controller along with GSM and GPS modules. This instrument is established in the engine of the automobile whose current function is to be recorded and locked the engine in real time. Main goal of this instrument is to shield the car from any unauthorized get right of entry to by means of supplying two locking status, theft mode and consumer mode. These two modes are managed via Arduino UNO and GPS science is used for finding current area of the vehicle. A GSM modem is additionally connected to the micro controller for sending message to the owner's mobile if the automobile is in theft mode. This machine places into the person mode if automobile is treated by means of the proprietor or licensed persons, otherwise goes to theft mode. The most essential thinking in this graph is introducing the cellular communications into the embedded gadget the usage of GSM module. The entire format is on a single board.

Keywords: ATmega328, GPS, GSM

I. INTRODUCTION

In cutting-edge life one of the serious troubles going through with the aid of people is vehicle thefts, which are growing in massive amount. Many crook offenses can additionally be accomplished with this theft vehicle. So to minimize any unauthorized access and leave out use of theft vehicles, we introduce a technology like GSM and GPS. We try to strengthen an instrument primarily based on Arduino Uno which included GSM and GPS technology. The instrument is easy and low cost car theft manipulates embedded system. The Arduino Uno is a microcontroller board based totally on the ATmega328. Uno capability one in Italian and used to be chosen to map the launch of Arduino Software (IDE) 1.0.The universal gadget for cellular communication (GSM/GPRS) modemRS232 is built with twin band GSM and GPRS engine – SIM900A works on frequencies 900/1800MHz. Global Positioning two System (GPS) is a space –based radio navigation system. Also we used vibration sensor to feel the vibration of the engine while it starts. The paper is prepared in the following sequence. A small literature survey on the theft manage device is given in part 2. two Section 3 describes the improvement of the block graph and its aspects for the design & improvement of the theft manipulate system. The working of the system is with flowchart in section four This is followed by way of the results, conclusions the references.

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II. RELATED WORK

The far flung monitoring system based totally on SMS and GSM used to be carried out in [1]. Here, the network is used as a medium for transmitting the faraway signal. This consists of two parts: the monitoring centre and the far flung monitoring station. The monitoring centres consist of a computer and verbal exchange module of GSM. The software-monitoring centre and the far off monitoring station had been carried out with the help of VB. The result of this demonstration indicates that the gadget can watch and manage the far flung conversation between the monitoring centre and the remote monitoring station [4,5,6,7]. In [2], the hardware and software of the GPS and GSM network had been developed. The proposed GPS/GSM based totally System has the two parts, first is a cell unit and every other is controlling station. The cellular unit and manipulate stations are working efficiently with the gadget processes, interfaces, connections, data transmission and reception of data. These results are well matched with GPS technologies. In automobile monitoring machine [3] is a device, which is established in a automobile to enable the owner or a third party to tune the vehicle. In this paper, the diagram works on the foundation of GPS and GSM technology. This gadget is based totally on embedded system. Tracking and positioning of any vehicle is detected by the usage of Global Positioning System (GPS) and Global system for cell conversation (GSM). The reputation of the transferring vehicle is uploaded often on demand. In Face Detection System [4], the face of the driver is detected, and it compares with the predefined face. When the proprietor is sound asleep during the night time time and any person theft the car, then the System obtains two the images of the thief by one two tiny net camera, which is hidden someplace in the car. Then the System compared the bought photographs with the saved images.

If the images do not match, then the information will be sends to the owner via MMS. The proprietors get the photographs of the thief in cell phone and can hint the region through GPS. The vicinity of the automobile and its velocity is additionally displayed to the owner through SMS. The proprietor can recognize the thief. This gadget utilized in our day-to-day life. Kai-Tai Song and Chih-Chieh Yang [5] have designed and built on a real-time visual monitoring gadget for car safety applications. In this paper constructed a novel feature-based vehicle-tracking algorithm, routinely become aware of and music various moving objects, like vehicles and motorcycles, ahead of the tracking automobile [8]. The system can segment facets of shifting objects from transferring background and offer a collision word of warning on real-time with the thinking of focus of enlargement (FOE) and view analysis CMOS photo sensor and NMOS embedded processor architecture is used in proposed algorithm. The constructed stand-alone visual tracking device is validated in actual avenue tests.

In [6,9,10,11] the proposed tracking gadget is based on cloud computing infrastructure. The sensors are used to screen the gasoline level, driver conditions, and pace of the vehicle. All the data relocated to cloud server-using GSM facilitated device. All the motors outfitted with GPS antenna to hit upon the place. To avoid the under the influence of alcohol and drive, the alcohol sensor established to screen the driver status. The proposed technological know-how appreciably avoids the accident in highways.

III. DESIGN OF EMBEDDED SYSTEM BLOCKS

The block diagram of the designed machine shown in the determine 1 has a microcontroller, GSM modem, GPS module, relay driver, Power Supply blocks which are interact with each different as follows. When power grant switched on it will supply 5V to the microcontroller and all other factors in the instrument. If the automobile is stolen, then the owner will get a message from the GSM cellular and the person can request to quit the engine via disconnecting connection from the 5V relay.

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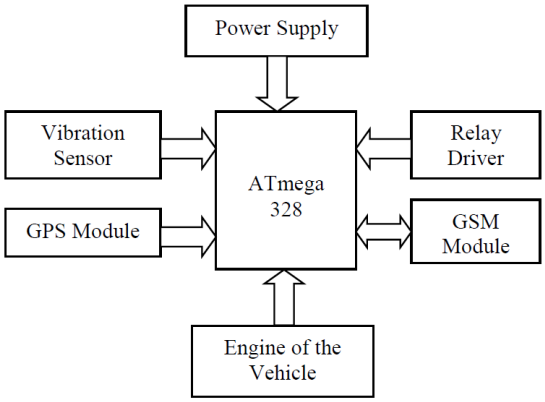

Figure 1: Block diagram of designed system

3.1 Microcontroller

Microcontroller is the coronary heart of the designed unit, which handles all the signals. All different blocks are interfaced to it. The most frequent version of Arduino is the Arduino Uno. The Arduino Uno is a microcontroller board based on the ATmega328.TheATmega328 is a single-chip microcontroller created through Atmel in the mega AVR family. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a sixteen MHz ceramic resonator, a USB connection, a strength jack, an ICSP header, and a reset button. The machine has throughput drawing close 1 MIPS per MHz.

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage(recommended)	7-12V
Input Voltage(limits)	6-20V
Digital I/O pins	14
Analog input pin	6
DC current per I/O pin	40mA
DC current for 3.3V pin	50mA
Flash Memory	32KB of which 0. 5KB used for boot loader

Table 1: Arduino Specification

3.2 GSM Module

GSM/GPRS Modem-RS232 is constructed with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800 MHz .The Modem is coming with RS232 interface, which approves you connect PC as properly as microcontroller with RS232 Chip (MAX232). The baud fee is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having interior TCP/IP stack to allow you to connect with web by GPRS. It is suitable for SMS, Voice as properly as DATA switch software in M2M interface. The onboard Regulated Power grant approves you to connect huge vary unregulated energy

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supply. Using this modem, you can make audio calls, SMS, Read SMS, solely a subset of the AT Command set desires to be implemented.

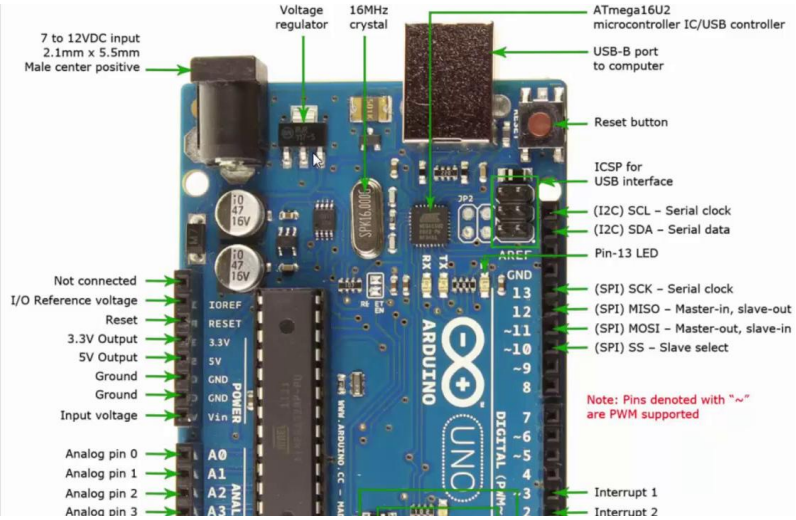

Table 2: Pin Specification

3.3 GPS Module

The GPS (Global Positioning System) is a condition of 30 well-spaced satellites. It orbits the Earth and makes it viable for people with floor receivers to pinpoint their satellite location. A GPS receiver should be locked on the sign of at least three satellites to estimate 2D position (latitude and longitude) and song movement. It depicts the use of GPS module/receiver to locate latitude and longitude of its position. The statistics bought from GPS receiver is processed by microcontroller to locate its latitude and longitude values.GPS module consists of 28 pins. With Live Tracking we get Live Alerts with the aid of SMS or Email, which are generated at best possible priority because Safety of the Vehicle is our Primary aim.

Figure 3: GPS Module

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3.4 Vibration Sensor

Vibration sensor is capable of measuring vibration of the engine when it starts. If the vehicle met an accident, the sensor will send voltage equal to the depth of hit, to the microcontroller at once. Then microcontroller sends a notification to the owner/contact list as SMS, if the sensed signal voltage is higher than or equal to some stored threshold value. So this will be beneficial to record any accidents happening at night. Thus we use this sensor for security of rider. There are two threshold values one to observe intrusion and any other to discover accidents. In the safety device piezoelectric sensor is used. It is generated by using strain on sure crystals which will boost a workable distinction or voltage on the crystal face. If the crystal oscillates, an AC voltage is formed. The sensor is modelled as a charge furnish with a shunt capacitor and resistor, or as a voltage source with collection capacitor and resistor.

Figure 4: Vibration Sensor

IV. PROPOSED SYSTEM

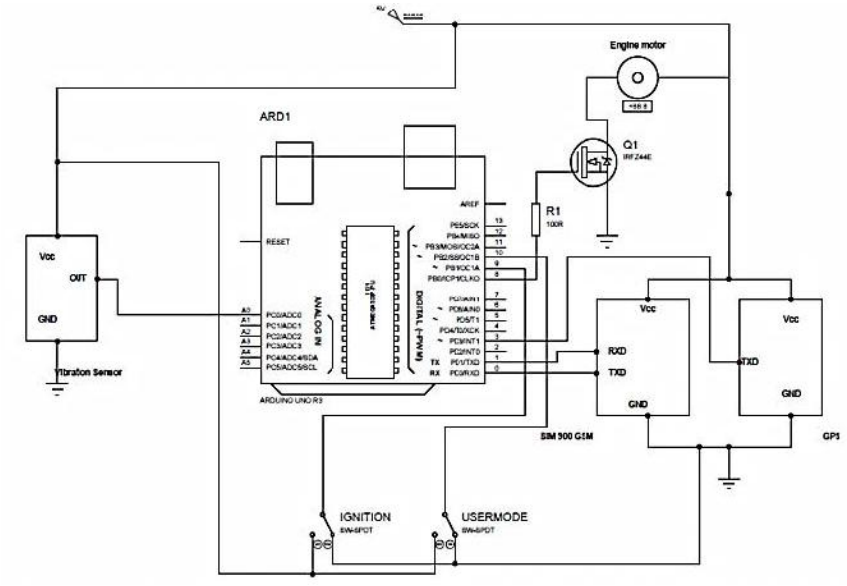

Figure 5: Circuit Diagram of GSM and GPS Based Engine Locking System Using Smart Password

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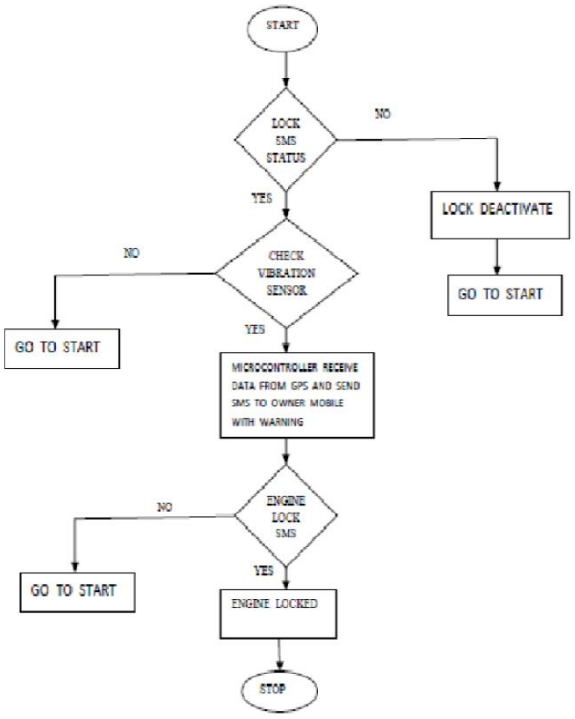

Figure 6: Flow chart of the system

The embedded gadget is hooked up in the engine of the vehicle along with GSM and GPS module. The instrument lets in to active the 5V and then ignition of the engine will start, hence begin the vehicle. The instrument has two modes of operation ,one is user mode and 2d one is theft mode .When engine will start ,then the instrument will check the lock status, if it is the proprietor engine will begin as person mode and no SMS will be send to owner however if it is anyone else ,theft mode comes into practice and it gives as SMS notification to the worried birthday party as programmed that is the vibration sensor in the instrument will feel the price of the vibration of the engine. If the engine vibrates extra than 10 seconds, then the sensing cost is given to the microcontroller. If the price is increased than the threshold value then sending a message "Engine Started" via GSM cellular to owner's cell for the further action for prevention of the automobile theft. After receiving this message the owner can send password '#' for getting the modern-day place of the vehicle, then the longitude and latitude will be received via the owner. If the owner will send password '*' ,then the proprietor can lock the engine of the vehicle thru this password and receiving a message "Engine Locked" and "current location" is also consist of as section of the message.

V. RESULTS AND DISCUSSION

In this paper, we proposed graph of special engine locking gadget to manipulate seizing of cars the use of GSM and GPS technological know-how based embedded system. The instrument has simple design, low cost, compact and reliable. This instrument can exchange with the aid of placing lock status field. If the vehicle accessed by way of unauthorized person, then proprietor get SMS and lock the machine the usage of the password. The prolong incurred for engine locking is 2-5 minutes.

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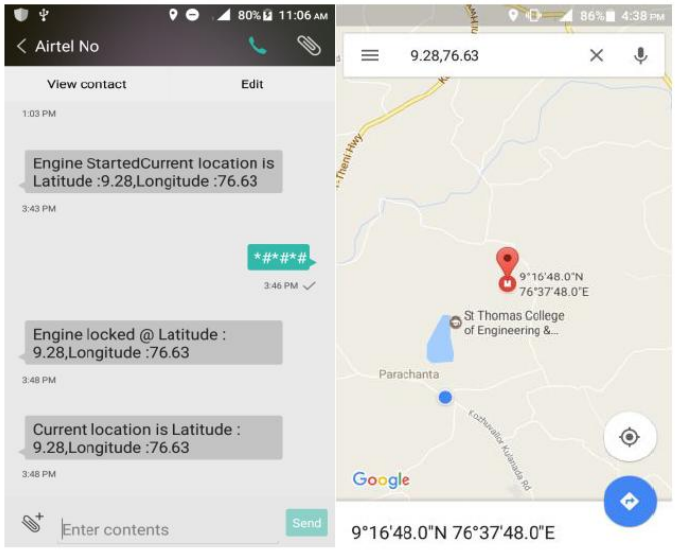

Figure 7: Message send to owner's mobile and location of vehicle

VI. CONCLUSION

Day with the aid of day the vehicles growing so as theft, on the foundation of this we can be generate the proposed device that is helpful. When accidents take place throughout the night time, the incident can file right away as SMS to the owner's contact listing so that the injured people can be hospitalized as soon as possible. As future improvement we can add greater points to the proposed machine through using hidden cameras in the front and returned aspect of the vehicle so that the details like variety of the car is given as SMS to owner's cell so that we can take the small print for similarly investigate, on procedure.

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