Review of Various Functions Controlling Of Vehicle by Using Mobile Bluetooth

Dipak A. Mhaske, Prof. S.S. Katariya, Prof. S.S. Kadlag

Abstract—this paper shows the various functions controlling of Vehicle using mobile Bluetooth Technology. Due to this technology the work of car user becomes easy. This system has two modes of operations viz RKE and PKE mode. This two keys are operated by 89c2051 and 89s52 microcontroller. The functions which are built in system can be handled away from the Vehicle within the range of 10 meters through Mobile Bluetooth.

Index Terms—Bluetooth communication, RKE, PKE

I. INTRODUCTION

The vehicle ignition by using mobile Bluetooth technology will be a great advantage in terms of human energy and time consuming. It is indeed free of charge or no cost involved and can be activated in safe mode since the vehicle still in lock condition. Therefore, in this project an application will be implemented and developed for mobile phone car ignition system by using Bluetooth technology. The system is constructed by integrating both hardware and software. This is an automatic vehicle locking system. In which there are two units one is placed in the vehicle which locks the vehicle if another unit (key) is outside the range. When only the driver or owner of the vehicle is in the range of the vehicle, the vehicle ignition will unlock along with the door and window. The Bluetooth is interfaced with the wires by the ignition switch at the auto starter car alarm remote control, which controls all the main functions in a vehicle. The mobile phone start module basically simulates turning a key in the ignition switch to start the vehicle and keep it running consistently. Whereby, the microprocessor inside the remote auto starter module constantly monitors the engine temperature as well as performance. Therefore, it will be ideally triggered whenever users feel they would like to start their car engine at any time. Bluetooth technology is no different -- it's wireless and therefore susceptible to spying and remote access, just like Wi-Fi is susceptible if the network isn't secure. With Bluetooth, though, the automatic nature of the connection, which is a huge benefit in terms of time and effort, is also a benefit to people looking to send you data without your permission. Bluetooth offers several security modes, and device manufacturers determine which mode to include in a Bluetooth-enabled gadget. In almost all cases, Bluetooth users can establish "trusted devices" that can exchange data without asking permission. When any other device tries to establish a connection to the user's gadget, the user has to decide to allow it. Service-level security and device-level security work together to protect Bluetooth devices from unauthorized data transmission. Security methods include authorization and identification procedures that limit the use of Bluetooth services to the registered user and require that users make a conscious decision to open a file or accept a data transfer. As long as these measures are enabled on the user's phone or other device, unauthorized access is unlikely. A user can also simply switch his Bluetooth mode to "non-discoverable" and avoid connecting with other Bluetooth devices entirely. If a user makes use of the Bluetooth network primarily for synching devices at home, this might be a good way to avoid any chance of a security breach while in public. Still, early cell-phone virus writers have taken advantage of Bluetooth's automated connection process to send out infected files. However, since most cell phones use a secure Bluetooth connection that requires authorization and authentication before accepting data from an unknown device. [1]

B. KEYLESS SYSTEM

Keyless entry is a standard feature in vehicles that have installed alarm systems. A small battery operated device or remote hangs on the key chain and features one or more buttons for arming and disarming the alarm. The button operates the door locks as well. When one approaches the car, a press of the button will not only disarm the alarm, but unlock the driver's door, making it unnecessary to use a key. Hence, it allows keyless entry.

Types of Keyless system:
1. Remote keyless system
2. Passive keyless system
A remote keyless system is a system designed to permit or deny access to premises or automobiles. While the "remote" system is portable and has locking capabilities, the exact phrase "keyless entry" is solely reserved for the numeric dials or keypads that are located on or near the driver side door. By entering the correct, pre-determined numeric code, one can gain access to a vehicle without a key - hence the phrase "keyless entry"; entry without a key. In the case of automobiles an RKS performs the functions of a standard car key without physical contact; power door locks can be locked or unlocked from several feet away or even from inside a building. (In this regard, the term "keyless" is a misnomer since the fob acts as an electronic key. Locking it in the car is just as much of a problem as doing the same with a mechanical key.) [7] [8] [9]

C. PASSIVE KEYLESS ENTRY SYSTEM

A Passive Keyless Entry solution provides the user with the convenience of unlocking a car door without pressing any buttons. The module inside the door initiates communication by sending out a signal between fixed time intervals to search for the paired Key Fob. Once in the proximity of the car door, the Key Fob sends back an acknowledgment signal. Upon positive authentication by the Receiver block, it signals the car door to be unlocked. [7] [8] [9]

D. WHY TO USE BLUETOOTH

<table>
<thead>
<tr>
<th>Data Rate</th>
<th>ZigBee</th>
<th>Bluetooth</th>
</tr>
</thead>
<tbody>
<tr>
<td>20, 40, and 250 Kbits/s</td>
<td>1 Mbits/s</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range</th>
<th>10-100 meters</th>
<th>10 meters</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Networking Topology</th>
<th>Ad-hoc, peer to peer, star, or mesh</th>
<th>Ad-hoc, very small networks</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Operating Frequency</th>
<th>868 MHz (Europe)</th>
<th>900-928 MHz (NA), 2.4 GHz (worldwide)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2.4 GHz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complexity (Device and application impact)</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Power Consumption (Battery option and life)</th>
<th>Very low (low power is a design goal)</th>
<th>Medium</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Security</th>
<th>128 AES plus application layer security</th>
<th>64 and 128 bit encryption</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other Information</th>
<th>Devices can join an existing network in under 30ms</th>
<th>Device connection requires up to 10 seconds</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Typical Applications</th>
<th>Industrial control and monitoring, sensor networks, building automation, home control and automation, toys, games</th>
<th>Wireless connectivity between devices such as phones, PDA, laptops, headsets</th>
</tr>
</thead>
</table>

Table No. 1 – Bluetooth Comparison

III. SYSTEM BLOCKS

This is an automatic vehicle locking system. In which there are two units one is placed in the vehicle which locks the vehicle if another unit (key) is outside the range. When only
the driver or owner of the vehicle is in the range of the vehicle, the vehicle ignition will unlock along with the door and window. The Bluetooth is interfaced with the wires by the ignition switch at the auto starter car alarm remote control, which controls all the main functions in a vehicle the mobile phone start module basically simulates turning a key in the ignition switch to start the vehicle and keep it running consistently. There is another function used for automated the vehicle such as AC function controlling, Fuel Indication, Window & Door locking unlocking through the various interfacing devices and circuitry

IV. SYSTEM ANALYSIS

A. Bluetooth

Blue LINK is a compact Bluetooth Module (5V Serial TTL) from rhydoLABZ. The module has built-in Voltage regulator and 3V3 to 5V level converter that can be used to interface with 5V Microcontrollers. The module has only 5 pins (Standard 2.54mm berg strip) VCC, GND, TX, RX and RESET. The module is factory configured in Transparent Mode and hence there is no command required for normal operation.

Features:
- Support Master & Slave Mode
- Support UART interface to host system
- Serial communications @ 2400-115200bps
- Breadboard Compatible
- Frequency: 2.4~2.524 GHz
- Power Supply: 5V [1]

B. Microcontroller 89s52:

Features:
- Compatible with MCS®-51 Products
- 8K Bytes of In-System Programmable (ISP) Flash Memory
- Fully Static Operation: 0 Hz to 33 MHz
- 256 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Three 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel [4]

C. Stepper Motor

Stepper Motor is known by its important property to convert a train of input pulses i.e. a square wave pulses into a precisely defined increment in the shaft position. Each pulse moves the shaft through a fixed angle. A stepper motor is an electrically powered motor that creates rotation from electrical current driven into the motor.

Physically, stepper motors can be large but are often small enough to be driven by current on the order of milli ampere. Current pulses are applied to the motor, and this generates discrete rotation of the motor shaft. This is unlike a DC motor that exhibits continuous rotation.

D. Relays

Relays are components which allow a low-power circuit to switch a relatively high current on and off, or to control signals that must be electrically isolated from the controlling circuit itself. To make a relay operate, you have to pass a suitable pull-in and holding current (DC) through its energizing coil. In each case the coil has a resistance which will draw the right pull-in and holding currents when it is connected to that supply voltage. So the basic idea is to choose a relay with a coil designed to operate from the supply voltage you’re using for your control circuit (and with contacts capable of switching the currents you want to control), and then provide a suitable relay driver circuit so that your low-power circuitry can control the current through the relays coil. Typically this will be around 70ma.

E. Microcontroller At89c2051.

Features:
- Compatible with MCS-51™ Products
- 2K Bytes of Reprogrammable Flash Memory
- 2.7V to 6V Operating Range
- Fully Static Operation: 0 Hz to 24 MHz
- Two-level Program Memory Lock
- 128 x 8-bit Internal RAM
- 15 Programmable I/O Lines
- Two 16-bit Timer/Counters
- Six Interrupt Sources
- Programmable Serial UART Channel
- Direct LED Drive Outputs
- On-chip Analog Comparator
- Low-power Idle and Power-down Modes [4]

F. Algorithm & Flowchart of Receiver Section

1) Start
2) Initialize uart mode
3) Initialize lcd
4) Wait for data to be received serially
5) Is data received= door lck_ulk then COMPLIMET the vehicle DOOR LOCK
6) Is data received= ignition lck_ulk then compliment IGNITION ON/OFF
7) If cmd auto received then unlock the door and turn on the ignition
8) Stop
E-NSPIRE, A National Level Conference held at Pravara Rural Engineering College, Loni, Maharashtra, INDIA.

V. CONCLUSION

“Bluetooth based vehicle inter lock system” is successfully implement & design through this project. We have design & operational various attributes of the vehicle like Ignition locking, Door Locking, Fuel indication, AC function, Window locking through the Bluetooth Device. This projects is feasible for following functions & which are beneficiary of

- Various control mechanism away from vehicle.
- Time saving/ Comfortable to user
- Secured

Fig.No.3 Algorithm & Flowchart of Receiver Section

Algorithm & Flowchart of Transmitter Section

G. Algorithm & Flowchart of Transmitter Section

V. CONCLUSION

‘Bluetooth based vehicle inter lock system’ is successfully implement & design through this project. We have design & operational various attributes of the vehicle like Ignition locking, Door Locking, Fuel indication, AC function, Window locking through the Bluetooth Device. This projects is feasible for following functions & which are beneficiary of

- Various control mechanism away from vehicle.
- Time saving/ Comfortable to user
- Secured
ACKNOWLEDGMENT

I take this opportunity to acknowledge a deep sense of gratitude to my seminar guide Prof. Katariya S.S. who made this entire work possible and without whose invaluable guidance this seminar paper could not have been completed. I am also thankful to the staff of the library for providing the necessary books, magazines for collecting the information related to the project. At last, but not the least, I would like to thank all my colleagues for providing help in my work.

REFERENCES


Author’s Profile

Mr. Dipak A. Mhaske has completed his B.E. (Electronics) & currently appear to M.E. (Electronics) in Amrutvahini College of Engineering, Sangamner, Dist. Ahmednagar, Maharashtra, India. He is working as Lecturer in Electronics Department, Pravara Rural Engineering College, Loni, Maharashtra, India.

Prof. Shraddha S. Katariya (Patni), has completed her M.E.(Electronics) & B.E. (E&TC), Member of IEEE & ISTE. She is working as a Assistant Professor in Electronics Department, Amrutvahini College Of Engineering, Sangamner, Dist. Ahmednagar, Maharashtra, India. Prof Katariya has teaching experience of 14 years to Undergraduate, Graduate & Post Graduate Students.

Prof. S.S. Katariya has Published 08 papers in International Journal, 02 papers in National Journal & presented 04 papers in International Conference & 15 papers in National Conferences.

Prof. Kadlag S. S. has completed his M.E.(Electrical, Control System) & B.E. (Electrical Electronics & Power), Member of ISTE. He is working as a Associate Professor in Electrical Department as Head Of Department, Amrutvahini College Of Engineering, Sangamner, Dist. Ahmednagar, Maharashtra, India. Prof Kadlag has teaching experience of 14 years to Undergraduate, Graduate Students and also has 3 years Industrial experience.

Prof. Kadlag S. S. has Published 02 papers in International Journal, 05 papers in National Journal & presented 02 papers Conference.