Abstract

Now in today’s world road safety has become a very important issue. Now we can see many vehicle accidents, many peoples dies due to unsafe driving. Drivers should know road signs, in fact they must obey road sign clearly, due to time stamping to reach the destination place, peoples should follow the times, as we always say “Go Slowly & Safety” but we found peoples are not follow these things and hence increased the death ratio in accidents. In this article, I would like to share some new technique to highlight some vehicle road sign using radio frequency identification during driving a vehicle. Till last decade this technique was working i.e. Replace road signs with RFID tags, and use in-vehicle RFID reader-enabled modules to sense them and provide tangible information to driver. Now GPS system is also become famous. But RFID is more secure and faster than GPS.
1. Introduction

In today’s world where science has made amazing advances so have the recent vehicles. These vehicles are more advanced than ever. They have more speed, state of the art engines and are very costly due to these reasons there is a need to adapt a device which can continuously monitor all the various parameters of vehicle. We are designing such a system which, will avoid accident in case of any accidents will record all the parameters and also help a prevent any accidents to happen. Actually if any colleges, schools and hospitals the speed of the vehicle should be limited i.e. 20km/hr. So the ratio of accidents should be less. Today, special attention is focused on the technologies that can reduce traffic accidents. Voices to voice technologies are simple to implement primarily because of their reliance on wireless communication The hassles of vehicular commuting in crowded metropolitans in developing countries are many & having to wait hours together in traffic jams, taking tortuous detours due to on-road constructions, trying to spot speed breakers, navigating blind turns, one-ways and so on. Forked roads, railway crossings, sudden reverse bends and steep ascents and descents are just few of the road oddities that one may encounter on the average drive. At times, such road oddities are accompanied by road-signs. Mandatory road-signs enforce law, while Cautionary road-signs are installed in hazardous areas to avert accidents. Informative road-signs provide directions, Locations and other information that is potentially useful to drivers in that locality. However, most vehicle drivers miss road signs more often than not. It is understandably difficult to keep an eye out for road signs when one should be focused on driving. The inconvenience is augmented by inadequate placement and poor noticeably of the signs. They are non-intelligent displays, and preventing traffic jams and providing personalized alerts are beyond their capacity.

Road signs are very important and vehicle driver must obey these signs. But sometimes we focus on driving so we don’t pay attention to these road signs. This may lead to accidents. Another case would be many times we are in very hurry that we don’t pay attention to these road sign boards and again this may cause traffic jams or accidents. Road transport is increasing rapidly in India. Therefore it is necessary to ensure driving safety. Road Traffic Signs are not only important to new car drivers. It is also important at every citizen in the India to know the important of traffic signs. Over the years of statistics, more and more people both on the road and off-road find these signs very important. This is why the Department of Transport, Highway Administration is strictly implementing these rules and regulations to avoid accidents on the road. The main reason why these signs are available on the road is because of safety. Traffic signs make sure that all drivers are aware of the rules and the dangers on the road. Without these signs, accidents may occur more often. These signs also warn the drivers of the potential dangers that can be encountered on the roads.

2. RFID Working

A Radio-Frequency Identification system has three parts:

- A scanning antenna
- A transceiver with a decoder to interpret the data
- A transponder - the RFID tag - that has been programmed with information.

The scanning antenna puts out radio-frequency signals in a relatively short range. The RF radiation does two things:

- It provides a means of communicating with the transponder (the RFID tag) AND
- It provides the RFID tag with the energy to communicate
This is an absolutely key part of the technology: RFID tags do not need to contain batteries, and can therefore remain usable for very long periods of time (maybe decades). The scanning antennas can be permanently affixed to a surface; handheld antennas are also available. They can take whatever shape you need. When an RFID tag passes through the field of the scanning antenna; it detects the activation signal from the antenna. That "wakes up" the RFID chip, and it transmits the information on its microchip to be picked up by the scanning antenna. In addition, the RFID tag may be of one of two types. Active RFID tags have their own power source; the advantage of these tags is that the reader can be much farther away and still get the signal. Even though some of these devices are built to have up to a 10 year life span, they have limited life spans. Passive RFID tags, RFID tags can be read in a wide variety of circumstances, where barcodes or other optically read technologies are useless as:

i. The tag need not be on the surface of the object (and is therefore not subject to wear)
ii. The read time is typically less than 100 milliseconds
iii. Large numbers of tags can be read at once rather than item by item.

3. RFID Technology Secure and Private

Unfortunately, not very often in the systems to which consumers are likely to be exposed. Anyone with an appropriately equipped scanner and close access to the RFID device can activate it and read its contents. Obviously, some concerns are greater than others. Companies are more concerned with the increasing use of RFID devices in company badges. An appropriate RF field will cause the RFID chip in the badge to "spill the beans" to whomever activates it. Another scenario involves a military situation in which the other side scans vehicles going by, looking for tags that are associated with items that only high-ranking officers can have, and targeting accordingly. If someone walks by your bag of books from the bookstore with a 13.56 Mhz "sniffer" with an RF field that will activate the RFID devices in the books you bought, that person can get a complete list of what you just bought. That's certainly an invasion of your privacy, but it could be worse. Another scenario involves a military situation in which the other side scans vehicles going by, looking for tags that are associated with items that only high-ranking officers can have, and targeting accordingly. Companies are more concerned with the increasing use of RFID devices in company badges. An appropriate RF field will cause the RFID chip in the badge to "spill the beans" to whomever activates it. This information can then be stored and replayed to company scanners, allowing the thief access - and your badge is the one that is "credited" with the access. The smallest tags that will likely be used for consumer items don't have enough computing power to do data encryption to protect your privacy. The most they can do is PIN-style or password-based protection.

<table>
<thead>
<tr>
<th>GPS</th>
<th>RFID (Passive)</th>
<th>RTLS</th>
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<tbody>
<tr>
<td>Outdoor location tracking technology for global tracking</td>
<td>Electronic identification technology that uses small, inexpensive, passive tags</td>
<td>Active tags are used for locating high-value assets and people in real time, enterprise-wide</td>
</tr>
<tr>
<td>Accuracy: 10+ meters</td>
<td>Accuracy: Only locatable next to RFID reader gates</td>
<td>Accuracy: Typically from sub-1 meter to 3 meters. Depends on Wi-Fi infrastructure in place.</td>
</tr>
<tr>
<td>Usage: Smartphone consumer apps, car navigator</td>
<td>Usage: Warehousing, retail, other logistic</td>
<td>Usage: Asset management, staff safety, patient / consumer tracking. Mostly in healthcare</td>
</tr>
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Design & Prototype of Vehicle Road Sign Delivery System using RFID

Figure 3.1: Block diagram of LPC2138
4. System Implementations

RF Transmission / Reception

RF refers to radio frequency, the mode of communication for wireless technologies of all kinds, including cordless phones, radar, ham radio, GPS, and radio and television broadcasts. In our project, we have successfully implemented rf technology for data transmission as well as reception. RF waves are electromagnetic waves which propagate at the speed of light, or 186,000 miles per second (300,000 km/s). The frequency of a wave is determined by its oscillations or cycles per second. One cycle is one hertz (Hz); 1,000 cycles is 1 kilohertz (KHz); 1 million cycles is 1 megahertz (MHz); and 1 billion cycles is 1 gigahertz (GHz). A station on the AM dial at 980, for example, broadcasts using a signal that oscillates 980,000 times per second, or has a frequency of 980 KHz. A station a little further down the dial at 710 broadcasts using a signal that oscillates 710,000 times a second, or has a frequency of 710 KHz. With a slice of the RF pie licensed to each broadcaster, the RF range can be neatly divided and utilized by multiple parties.

RF Transmitter:

The TWS-434 extremely small, and are excellent for applications requiring short-range RF remote controls. The TWS-434 modules do not incorporate internal encoding. If simple control or status signals such as button presses or switch closures want to send, consider using an encoder and decoder IC set that takes care of all encoding, error checking, and decoding functions. The
transmitter output is up to 8mW at 433.92MHz with a range of approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls. The TWS-434 transmitter accepts both linear and digital inputs can operate from 1.5 to 12 Volts-DC, and makes building a miniature hand-held RF transmitter very easy.

Figure 4.1: RF Transmitter

RF receiver:
RWS-434: The receiver also operates at 433.92MHz, and has a sensitivity of 3uV. The WS-434 receiver operates from 4.5 to 5.5 volts-DC, and has both linear and digital outputs. A 0 volt to Vcc data output is available on pins. This output is normally used to drive a digital decoder IC or a microprocessor which is performing the data decoding. The receiver’s output will only transition when valid data is present. In instances, when no carrier is present the output will remain low. The RWS-434 modules do not incorporate internal decoding. If you want to receive Simple control or status signals such as button presses or switch closes, you can use the encoder and decoder IC set described above. Decoders with momentary and latched outputs are available.

Figure 4.2: RF receiver

5. System Advantages, Disadvantages and Application

Advantages
- Accidents can be prevented.
- Traffic jams can be avoided.
- Traffic law and order will be properly maintained.
- It enhances driving safety.
- The RFID tags can be buried under earth also so there is no chance of being stolen.

Disadvantages
- Range is small.
- Sometimes receiver may go undetected.
Applications

- Wireless hardware reduces the dependency on static road signs.
- Efficient electronic alternative to static road signs.
- Since there are 99 different road signs, it is difficult to remember all of them. So our hardware helps to identify the road signs so that necessary action can be taken by driver.

6. Conclusion & Future Scope

In this system we are demonstrating the full scale prototype design of a system that can deliver road signs and other road related mandates inside commuters' vehicles. Rather than erecting more road signs continually, which only add to driver distraction, we introduce a possible shift in the way cautions and other information is provided to vehicle drivers. There is a plethora of prospective benefits it has for vehicle owners and public transport users alike, which have been documented in An RF-module Based in-Vehicle Alert system for Road oddities. Drivers can receive route suggestions and directions at regular intervals even if their vehicle is not equipped with a GPS module. Dependency on road signs will lessen.

References