Smart Card Based Licensing System for Transportation

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Abstract - Main purpose of this system is to verify vehicles license and insurance is correct or not. This application is designed based on RFID technology where RFID are installed at all signals and each vehicle number is having RFID tag. When vehicle passes through signal RFID will read vehicle number and send data to microcontroller and verification process is completed. If the license is not in proper manner, the fine amount will be added and they repeat the same means license will be blocked until they pay the fine. Alcohol sensor is used to find whether the driving person is consumed alcohol or not.

Keywords – PIC 16F877A µC, Alcohol sensor, GSM, RFID, BUZZER, LCD.

I.   INTRODUCTION

The design of this project is proposed ofthis system is to verify vehicles license whether check the insurance is correct or not. This application is designed based on

Here the tag will be handled by the authorized person who is driving the Vehicle. By using the RFID reader it will read the tag message and send it to the PIC microcontroller. The information's are already booted in PIC. By using that it will cross verify the details of the card holder. If it matched the details will be displayed about license and insurance whether it is correct or not. If it is wrong the buzzer will buzz. After that by using GSM the message will be sent to the RTO department regarding fake report. And also, the amount will be debited from the card itself. We are including alcohol sensor to check whether the person is drunk and drive

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II.   WORKING OF THE SYSTEM
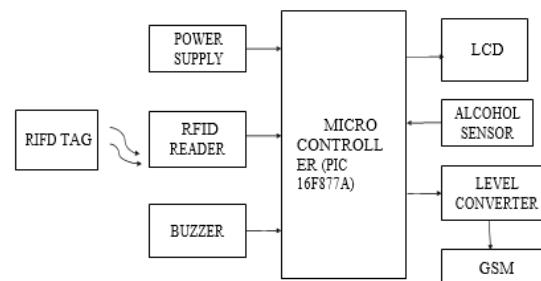
Types of RFID devices: Passive

Passive   RFID devices   have no power supply built in.   electrical current transmitted by the RFID reader inductively powers the device, which allows it to transmit its information back. Since the tag has a limited power supply, its transmission is much more limited than an active tag, typically no more than simply an ID number. Similarly, passive devices have a limited range of broadcast, requiring the reader be significantly closer

than an active one would.

Uses for passive devices tend to include things such as inventory, product shipping and tracking, use in hospitals and for other medical purposes, and anti-theft where it is practical to have a reader within the five meters or so of the RFID device. Passive devices are ideal in places that prevent the replacement of a battery, such as implanted under a person's skin.

Active

Active RFID devices are self- powered. These contain a battery to power the transceiver, which broadcast the stored data continually. Since they contain a power supply, the potential range and information broadcast is much greater than in a passive tag. A feature that most active tags have and most passive tags do not is the ability to store data received from a transceiver. The battery life potential has greatly increased over the years, currently having an upper bound of several years. Active tags are ideal in environments with electromagnetic interference since they have a stronger signal broadcast and in situations that require a greater distance between the tag and the transmitter.

Size Difference

The additional space taken up by a battery in an active device necessitates that the active devices are substantially larger, at their smallest, than the smallest a passive device may be. To date, passive tags may be commercially available as small as 0.4mm square and thinner than a sheet of paper. In contrast, commercially available active tags are still only as small as a coin, which means that active tags are around 50 times the size of passive ones

Antenna Types

The antenna type for a given device can be customized for its specific purpose. In the customization, there are limitations, which include the physical size of the antenna, the materials used for packaging, what the product is, and where on the package it will go. The readability of the tag is affected by all of the above

limitations, especially the location of the antenna relative to the reader.

GSM MODEM

It is abbreviated as Global System for Mobile communication. It is one of the most secured cellular telecommunication systems. It was used by all the peoples for establishing phone calls and sending messages So it is considered as globally accepted and it also a digital cellular communication system. It uses Gaussian Minimum Shift Keying (GMSK) modulation method. It has a total symbol rate for 1 bit/symbol. The uplink frequency range of the system is 933-960MHZ and it has a downlink frequency range of 890-915 MHZ. It maintains end to end security. It Indicates channel spacing which means that the spacing between adjacent channel frequencies of 200KHZ.It was used by 400 million peoples and more than 200 countries for communication.

Alcohol Sensor

It is one of the high sensitivity sensors. It is mainly used for gas leakage detection. It is best suitable for LPG, H2, CH4, CO and alcohol. Here we are using

this sensor for checking whether the person is drunk and drive. It gives faster response. Its sensitivity is adjusted by potentiometer. Its operating voltage is 5V DC. It was stable and gives long life. The sensor is made up of semiconductor. The load resistance was adjustable in circuits. The preheat time of this sensor is over 48 hours.

BUZZER

A buzzer is an audio signal device and it is mainly used to give indication about particular problem in the form of alarm. It is basically connected with the battery in order to produce magnetic effect. This makes the electricity flow through the internal circuit and it attracts the armature and produces a sound. The buzzer we have used is made up of piezoelectric material. It can be naturally available or manmade. This material produces electricity when mechanical pressure applied on it. This buzzer was operating on DC power supply.

LCD DISPLAY:
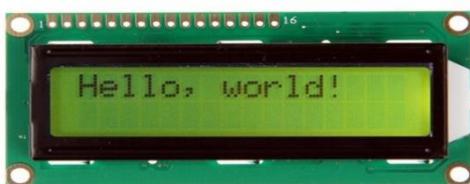
Liquid Crystal Display (LCD) is the most commonly used display device. It displays much thinner than other technologies. In this project, we are using flat panel display which has 16 pins. The control line pins are connected to port E and data lines pins are connected to port D accordingly. The 15th and 16th pins of LCD are used for back light LED. It gives brightness at the bottom side of the display. It can able to display characters' numbers and special characters. Liquid crystals cannot able to emit the light directly. For that they use back lights in order to produce images in color.

POWER SUPPLY

A power supply is an electronic device that supplies electrical energy to all the components in the system. Power supply mainly consists of four parts. First one is transformer. Here we are using step down transformer which converts 230V AC supply into 12V AC supply. The second part is rectifier. The type of the rectifier used is bridge rectifier. It converts AC supply into DC supply. The third part is that filter capacitor which is used to obtain pure DC signal. Finally, we are having regulator for regulating the voltage with given value.

MICROCONTROLLER (PIC 16F877A)

The specification of microcontroller is 16F877A. It belongs to high performance RISC family. It means that 16 refers to serial number, F means Flashable, 8 refers to 8 bit, 77 is a product

number and A refers to analog or advanced. Its speed is 1 to 20MHZ. It has a memory of 8KB along with that it has an internal memory (EEPROM) of 256 bytes. It was ten lacks times rewritable. It has a retention capacity of 40 years. This microcontroller was self reprogrammed under software control. It is a 40 pin microcontroller. There are five ports. Port B, port C and port D each having 8 pins. Port A having 6 pins and port E having 3 pins. And also it has fifteen interrupts. 14 interrupts are internal and the remaining one is external. Interrupts are mainly used to avoid data loss and it identifies the error at any line in a program. There are 2 types of communications available in pic microcontroller. One is serial another one is parallel. In these two methods we are mainly using serial communication in order to establish a communication.

LEVEL CONVERTER
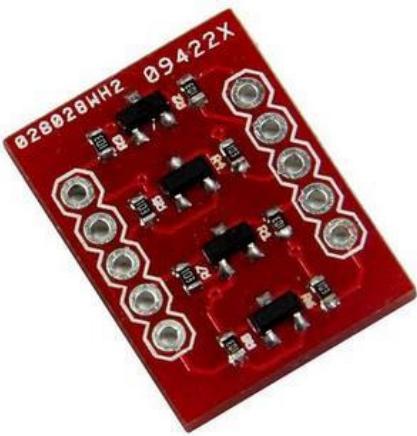
The main purpose of level converter is that it translates CMOS logic into TTL logic. Most of the electronic components are worked with TTL logic. In this project we are using GSM for sending the message about the fine amount. But the output of the GSM is based on CMOS logic. It is only applicable to the software systems. So that we are using level converter. The output of GSM is connected to the level converter and then in turn it is connected to the microcontroller.

III. RESULT& CONCLUSION

Our project contains RFID reader and RFID tags (vehicle insurance, driving license) whenever the tag is shown in front of the reader it will read the data from the tag, if it is valid it will display on LCD as valid otherwise the buzzer will buzz. Additionally, we are having alcohol sensor to identify whether the person is in drunk and drive or not. This process helps the user and police department to verify the documents of the vehicles whether the particular data is correct or not.

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