

# Automated License Management System Using RFID

S. Arivoli

Associate Professor

Department of Electronics and Communication Engineering  
Sengunthar Engineering College  
Tiruchengode, Namakkal District, TamilNadu, India.

**Abstract**— Normally, in license tests a candidate applied for license have to drive over a closed loop path like the number (8) in front of the authorities. The candidate has to drive over the path without any support over the land surface and if he fails to do he will be disqualified. For that, the authorities have to watch him/her manually. A system for watching the candidate whether he/she is eligible for getting license by using a load cell has been proposed here. The load cell changes its output when there is any pressure change over the surface. Thus the differential output from the load cell detects the candidate who fails to keep his/her foot in the vehicle while following the path. Then the differential output was processed by the micro-controller. The ultrasonic sensor is used for hand signal detection and finger print sensor is used for the number of attempts made by a person during license test and thereby automatically reject or pass status will be generated by the system.

**Keywords**— Finger print sensor, ultrasonic sensor, Load cell

## I. INTRODUCTION

Despite continued efforts made by the different state governments in India, various international and national organizations continue to highlight the fatalities on the roads caused by inconsistent process of issuing driving licenses across India. The study conducted by the International Finance Corporation (IFC) indicates that the process of obtaining driving license in India is a distorted bureaucratic one. The independent survey conducted shows that close to 60 percent of license holders did not even have to take the driving license test and 54 percent of them were untrained to drive. The study conducted by IFC also shows that the driving license is in that category of public services that involves corruption of a direct demand and supply of bribes between citizens and bureaucrats. The study also indicates that the corruption is focused on agents that work as intermediaries between the officials and citizens. This practice of agent-usage promotes corruption and subsequently results in higher payment for licenses, reduces driving test quality and this eventually results in unskilled drivers on road. Hence the only solution for this problem is to implement an efficient, transparent and cost effective driver testing system. In the present scenario, the candidates who have applied for driving license have to appear for a theoretical examination and a practical examination. The theoretical examination evaluates the candidate knowledge on different traffic signs, traffic regulation and also the basic understanding of simple safety check before using a vehicle. Different ways are adopted for the conduct of theoretical examination. These are oral examination, question paper or computer based examination. Theoretical examination is conducted before the practical examination. A pass in the theoretical examination is a prerequisite for the practical examination. The practical examination comprises of two tests namely off-road test and on-road test. The off road test is for examining the candidate's ability in controlling the vehicle. The on-road test is conducted in light traffic on normal road. Normally, the on-road test is carried out after completing off-road test. The off-road test tracks are of three types – H, S and 8 shaped tracks. In India, the test track adopted for off-road test purpose varies from state to state.

### 1.1 Domain Detail

An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use. Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale. Physically, embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure. In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with a programming interface, and embedded systems programming is a specialized occupation. Certain operating systems or language platforms are tailored for the embedded market, such as Embedded Java and Windows XP Embedded. However, some low-end consumer products use very inexpensive microprocessors and limited storage, with the application and operating system both part of a single program. The program is written permanently into the system's memory in this case, rather than being loaded into RAM (random access memory), as programs on a personal computer are.

### 1.2 EXISTING SYSTEM

In the present scenario, the candidates who have applied for driving license have to appear for a theoretical examination and a practical examination. The theoretical examination evaluates the candidate knowledge on different traffic signs, traffic regulation and also the basic understanding of simple safety check before using a vehicle. Different ways are adopted for the conduct of theoretical examination. These are oral examination, question paper or computer based examination. Theoretical examination is conducted before the practical examination. Pass in the theoretical examination is a prerequisite for the practical examination. The practical examination comprises of two tests namely off-road test and on-road test. The off road test is for examining the candidate's ability in controlling the vehicle. The on-road test is conducted in light traffic on normal road. Normally, the on-road test is carried out after completing off-road test. The off-road test tracks are of three types – H, S and 8 shaped tracks. In India, the test track adopted for off-road test purpose varies from state to state.

### 1.3 PROPOSED SYSTEM

In this proposed track, in addition to detect interruption along the edges, we must also check if the vehicle moves correctly in the specified path. For detection of the correct path, we again use the same setup consisting of metal strips (pressure switch). Here we are using pairs of metal strips and they are placed in positions as shown in the diagram. The test taker must move to the following path. That is the test taker must start at start position and end the test at stop position. Here the metal strip is kept horizontally across each path. When the vehicle moves through the respective path, the metal strip is not conducting and this is done in a sequential manner that is from path start to stop end. On successful completion of the test, "pass" report will be generated or else a "fail" report.

## II SYSTEM REQUIREMENT

#### HARDWARE:

ATmega8A microcontroller  
 Load cell  
 RFID  
 IR Sensors  
 16\*2 LCD display  
 Power Supply Unit  
 Buzzer

#### SOFTWARE:

Platform - AVR STUDIO  
 In System Programmer - ProgISP 172  
 Compiler – Win AVR  
 Visual basic .NET

## III. SYSTEM DESIGN

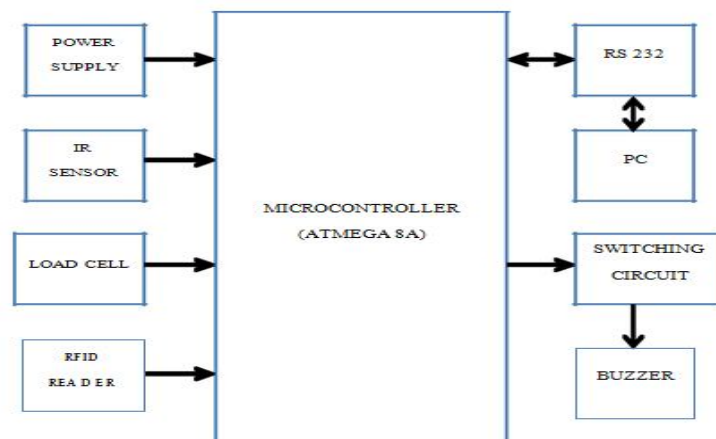


Fig: Block Diagram of Proposed System

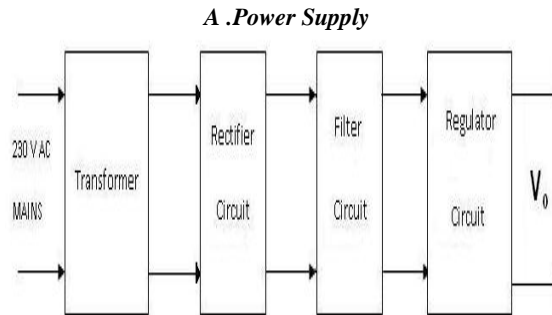


Fig.2 Block diagram of power supply

The given block diagram includes following:

**Transformer:**

A transformer is an electro-magnetic static device, which transfers electrical energy from one circuit to another, either at the same voltage or at different voltage but at the same frequency.

**Rectifier:**

The function of the rectifier is to convert AC to DC current or voltage. Usually in the rectifier circuit full wave bridge rectifier is used.

**Filter:**

The Filter is used to remove the pulsated AC. A filter circuit uses capacitor and inductor. The function of the capacitor is to block the DC voltage and bypass the AC voltage. The function of the inductor is to block the AC voltage and bypass the DC voltage.

**Voltage Regulator**

Voltage regulator constitutes an indispensable part of the power supply section of any electronic systems. The main advantage of the regulator ICs is that it regulates or maintains the output constant, in spite of the variation in the input supply.

**b.IR SENSOR**

The IR sensor is used for detecting the line tracking.

**c. Load Cells**

A load cell is a transducer that is used to convert a force into electrical signal. The most common type is a **strain gauge** load cell. A load cell is made by bonding strain gauges to a spring material. To efficiently detect the strain, strain gauges are bonded to the position on the spring material where the strain will be the largest.

**d.RFID**

The RFID Proximity OEM Reader Module has a built-in antenna in minimized form factor. It is designed to work on the industry standard carrier Frequency of 125 kHz.

This LF reader module with an internal or an external antenna facilitates communication with Read-Only transponders—type UNIQUE or TK5530 via the air interface. The tag data is sent to the host systems via the wired communication interface with a protocol selected from the module Both TTL and wiegand protocol. The LF module is best suited for applications in Access Control, Time and Attendance, Asset Management, Handheld Readers, Immobilizers, and other RFID enabled applications.

**e. MICROCONTROLLER**

The AVR is a modified Harvard architecture 8-bit RISC single chip microcontroller which was developed by Atmel in 1996. The AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM, EPROM, or EEPROM used by other microcontrollers at the time.

### ATmega8

#### Features:

- High-performance, Low-power AVR® 8-bit Microcontroller
- Advanced RISC Architecture
  - 130 Powerful Instructions – Most Single-clock Cycle Execution
  - 32 x 8 General Purpose Working Registers
  - Fully Static Operation
  - Up to 16 MIPS Throughput at 16 MHz
  - On-chip 2-cycle Multiplier
- High Endurance Non-volatile Memory segments
  - 8K Bytes of In-System Self-programmable Flash program memory
  - 512 Bytes EEPROM
  - 1K Byte Internal SRAM
  - Write/Erase Cycles: 10,000 Flash/100,000 EEPROM
  - Data retention: 20 years at 85°C/100 years at 25°C(1)
  - Optional Boot Code Section with Independent Lock Bits

#### f. RS 232

Due to its relative simplicity and low hardware overhead (as compared to parallel interfacing), serial communications is used extensively within the electronics industry. Today, the most popular serial communications standard in use is certainly the EIA/TIA-232-E specification. In recent years, this suffix has been replaced with “EIA/TIA” to help identify the source of the standard. We use the common notation “RS-232”.

#### g. Switching Circuit

The pressure switch (metal strip) are used as pairs where each pair consists of a transmitter and a receiver. The IR sensors can be also referred to as a long range IR start, stop pair. Sensors are mounted on to yardstick for embedding on the track. The IR sensor pairs, pressure switch used for detecting the trouncing of sensor mounted yardstick or the crossing of line intersection between the sensors. Two IR sensors are used at “START” and „STOP” position of the track. Speed sensor is used into the vehicle wheel to enable or disable of zero rpm measurement system. These sensors are interfaced to the microcontroller based central control unit. When either of these sensor pairs makes a high to low transition. The microcontroller based central control unit enables or disables the microcontroller based on-vehicle control unit for monitoring the vehicle motion. The on-vehicle control unit for zero rpm measurement is designed to perform the measurement only when the vehicle is inside the sensor embedded track.

## IV. DATA ACQUISITION SYSTEM IN VB

#### User personal details:

The test taker enters his personal data in the specified field. Here the test taker has to fill his name, date of birth, e-mail, mobile number, address and gender. If any one of the data is not filled, then a pop up window displays for filling the data.

#### Test Status:

The test status of the candidate who is undertaking the test is displayed in this test status box. On successful completion of the test, „PASS” message will be displayed or else a „FAIL” message will be displayed.

#### System Status:

Here the system status will be displayed i.e. It displays the status of the test taken by the candidate. Here the system first gets ready, initializes, monitors, save the report and displays the report.

#### Test Taking:

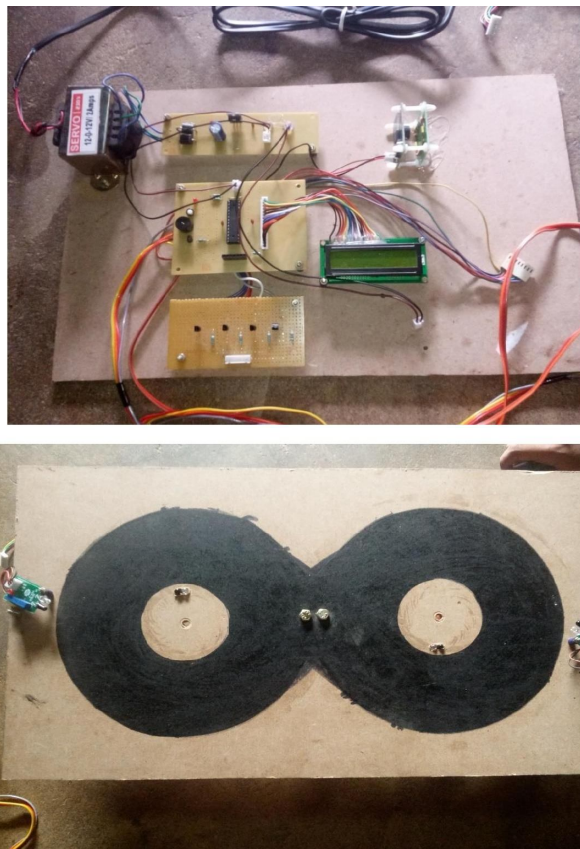
Once the mandatory details are completed, then the test taker can get ready for his test by entering the vehicle. On his word the controller can press the „START” button on the software interface. This will mark the commencement of the test (for the controller at the PC interface, the LCD display will show processing). If all goes well and the driver returns his car safely without any deviations in the „H” (curved) track, press the „STOP” button on the software interface. This will point to the end of his test (for the controller at the PC interface, the LCD display will show some indication). The candidate can now get his result at the software interface.

## V. CONCLUSION

A Driving License test automation system using RF Module based wireless acquisition is discussed. The usage of VB based technology for skill assessment in the automated driving test process eliminates human intervention leaving no scope for manipulation and negotiation. Hence we can say that the system increases the level of transparency in the driving skill test process and decreases the rate of corruption in the process of issuing the driving license.

## VI. RESULT

There are three conditions to get driving license (i)to cover the complete path.(ii)do not ouch or hit the edges(iii)speed of the vehicle must not to be zero. When all these condition are satisfy then the pass result will be displayed in the form of report, otherwise fail report will be generated.



*Fig:3 Working Model*

## REFERENCES

- [1]. Marianne Bertrand, Simeon Djankov, Remma Hanna and SendhilMullainathan,“Obtaining a Driver’s License in India: An Experimental Approach to Studying Corruption”, The Quarterly Journal of Economics (2007) 122 (4): 1639-1676.
- [2]. Driver errors cause most road deaths in India”. The Times of India on the web.2010 – 07-04.
- [3]. Mondal, P, Abhishek Kumar, U. D. Bhangale, and Dinesh Tyagi. “A Silent Tsunami on Indian Road: A Comprehensive Analysis of Epidemiological Aspects of Road Traffic Accidents”. British Journal of Medicine & Medical Research: 1(1):14-23, 2011. 2011-09-26.
- [4]. ShizhuangLin; JingyuLiu; YanjunFang; Wuhan Univ., Wuhan" ZigBee Based Wireless Sensor Networks and Its Applications in Industrial"IEEE International Conference on Automation and Logistics, 200718-21Aug.2007page(s):1979-1983Location:Jinan
- [5]. Xiuping Zhang; Guangjie Han; Changping Zhu; Yan Dou; Jianfeng Tao;" Research of WirelessSensor Networks based on ZigBee for Miner Position", [J]International Symposium on Computer,Communication, Control and Automation, IEEE. 29 July 2010Pg1 – 5.
- [6]. Dunfan Ye, Daoli Gong, Wei Wang,“Application of Wireless Sensor Networks in EnvironmentalMonitoring”2nd International Conference on Power Electronics and Intelligent TransportationSystemIEEE2009pp- 2563-2567.