Design of Vehicle License Monitoring System to Control Theft by using IOT

S.Akila , Deepthi Joseph , K.Vidya, P.Annapoorani, N.Anantha Saravanan

Abstract: ***Smart transportation for urban cities can be done using Internet of Things (IOT). An automated object detection algorithm is used to identify the vehicle by using VLPR system. Identification of vehicle in heavy traffic or in parking lots is difficult and hence we propose a system by using RFID tags where the vehicle movement and vehicle license plate number can be obtained accurately. So by using IOT we can access the data from anywhere and the vehicle movement can be identified. Instead of using digital camera where due to external disturbance the images gets blurred, so we go for RFID where due to radio frequency transmission they stores the data. The performance of the device will not get degraded due to shadow noise, thunders and due to heavy speed. The main aim of proposed system is to check the vehicles license number and drivers vehicle license and to verify the vehicles RC book renewal.***

Keywords: PIC, RFID Tags, RFID Modules, VLPR.

I. INTRODUCTION

A completely automated system that can take away the whole hassle of inventory management at provision or even in bigger establishments can be implemented without even using a computer for this application using the convergence of embedded systems and conventional computers [17]. Automated object detection is an important research challenge
nowadays because they are used for the surveillance systems for developing a smart cities by using internet of things (IOT).

II. HARDWARE SETUP

The hardware plays a vital role for
designing a system. In this proposed system the hardware components used are listed below:

PIC Micro Controller : PIC16F877A
Digital Display : 16 X 2 LCD
BUZZER
IOT Modem
RFID Reader:EM-18 Reader Module

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A. PIC MICROCONTROLLER

PIC Microcontroller consists of 40 pins. They uses 5v as input power supply and they are 8 bit micro controller. They have three timers such as timer 0, timer1, timer2. It consists of ADC which contains 8 channels and UART, I2C, SPI, PWM.

B. FLASH MEMORY

Flash memory is used for reading and writing the program in the microcontroller. That is to read a program memory address or to locate a memory address, they should write EEADR and EEADRH address to the registers, so that data can be read by giving memory address.

To write program data in the flash memory, the flash memory must be first loaded into the buffer register. After loading process to Flash Memory the first thing to be done is to write to EEADR and EEADRH about its destination address and, then to write the data to EEDATA and EEDATH.

C. DIGITAL DISPLAY: 16X2 LCD

LCD consists of 16 pins.D0 to D7 are data pins. LED is set up in the back of LCD for flash the values. Anode and cathode for supply voltage. LCD and Sensor requires 5V. In this system the LCD is used to display the license match and the vehicles owned by the users.

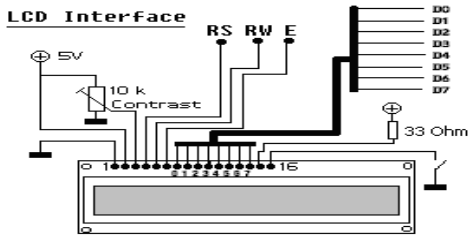


Fig.1. LCD interface

D. BUZZER

A buzzer circuit and LCD display is placed in a server unit for the surroundings to alert them. It has a signal display in which, a signal automatically turns to red when any abnormal occurs and becomes green when the habitual with a help of LED.

A buzzer or beeper is an electronics device used for signal transferring in the place of alarm. They usually consist of switch or sensor which are connected to control unit which determines whether the switch is in ON or OFF otherwise if the switch is lapsed.

They usually illuminate a light on top of the buzzer, and they will make sound which is
used as a warning.

The buzzer makes the sound only when the license plates not get matched .If there is any mischievous behavior occurs then only the buzzer makes sound.

E. UART

UART stands for Universal Asynchronous Receiver/ Transmitter where they are used to transmit/receive data through the virtual terminal

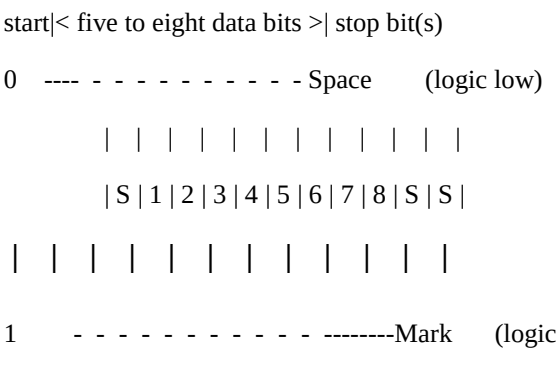


Fig. 2. Asynchronous Code Format

The right-most bit is transmitted first. If there is parity while transmitting, then the parity bit comes before the stop bit(s) and after the data bit(s).

Table I. Table for Baud Rate Formula

SYNC	BRGH=0 (Low Speed)	BRGH=1(High Speed)
0	(Asynchronous) Baud Rate=Fosc(64(X+1))	Baud Rate = Fosc(16(X+1))
1	(Synchronous) Baud Rate= Fosc (4(X+1))	NA

X=value in SPBRG (0 to 255)

F. RADIO FREQUENCY IDENTIFICATION DEVICE (RFID)

The RFID tag uses IC and antenna for frequency conversion. The device will include memory and capacity to handle the process. The memory can be read/write or read only or write only that is based on the application that requires.

When the tag is brought in the range of the interrogator or the reader, it receives the signal which is sent by the reader (interrogator). In case of a passive tag, it receives all the power it needs from the signal itself. By using radio waves to carry the data, the power can be obtained from tags which convert the data in radio frequency.

This means the tag gets powered only when they are pace in between the interrogators. These tags are used as backscatter to reply to the interrogator. It is nothing but reflecting carrier waves and to put that signal in reflection batteries that act ac passive tags and they should have the battery to provide power and this does not involves a transmitter.

G. CRYSTAL OSCILLATOR

Crystal Oscillators is a fixed frequency oscillator where the stability and accuracy are primary considerations. We use 16MHZ as operating frequency in our device.

III.PROPOSED SYSTEM

In this paper, the main aim is to select the vehicles license plate number or driver license or the vehicles RC book renewal out from the RFID Tags. This method helps us to detect vehicles movement accurately and also used to reduce the data memory that are to be stored in cloud systems. Also in order to avoid theft each person has to enter their vehicle license number to their driver license identity.

In order to check whether the vehicle owned by the owner or a theft vehicle we go for RFID. The data then transferred through a GSM modem i.e., IOT Modem to the cloud link provided by the IOT and that link can be accessed from anywhere of the world and also by using PC or Mobile.

BLOCK DIAGRAM

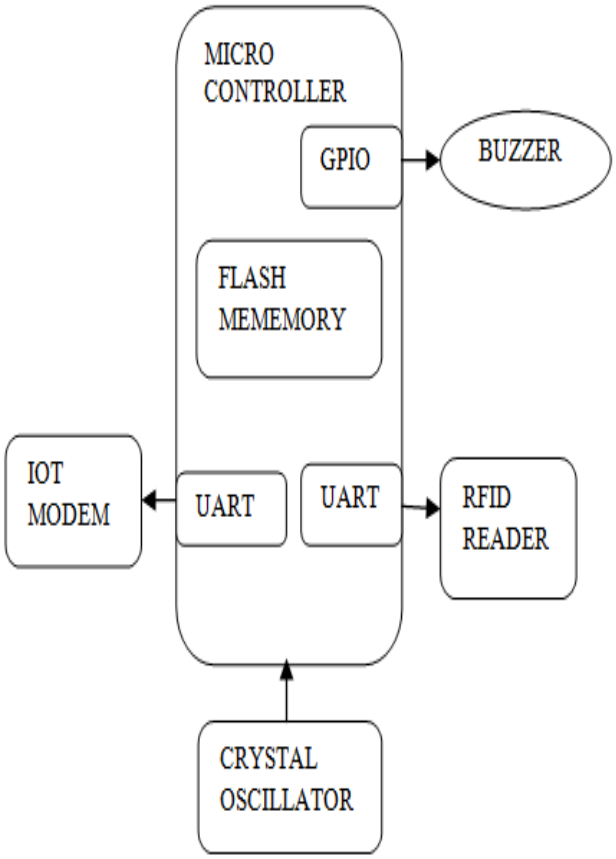


Fig.3 Hardware Setup

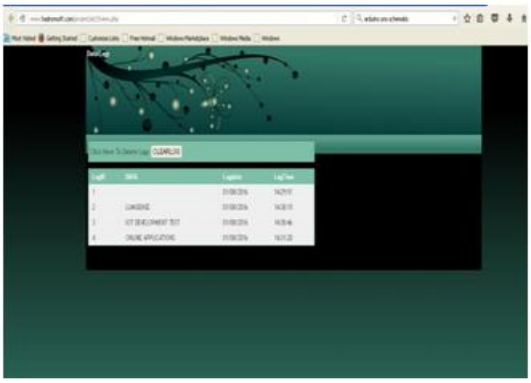
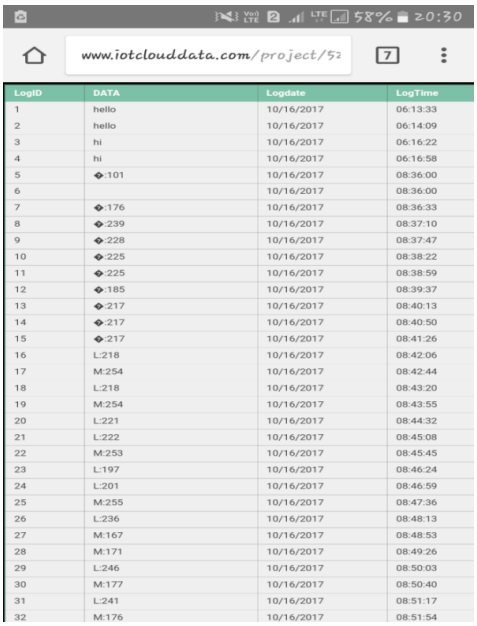


Fig. 4. Web Server



www.iotclouddata.com/project/52

LogID	DATA	Logdate	LogTime
1	hello	10/16/2017	06:13:33
2	hello	10/16/2017	06:14:09
3	hi	10/16/2017	06:16:22
4	hi	10/16/2017	06:16:58
5	◆101	10/16/2017	08:36:00
6		10/16/2017	08:36:00
7	◆176	10/16/2017	08:36:33
8	◆239	10/16/2017	08:37:10
9	◆228	10/16/2017	08:37:47
10	◆225	10/16/2017	08:38:22
11	◆225	10/16/2017	08:38:59
12	◆185	10/16/2017	08:39:37
13	◆217	10/16/2017	08:40:13
14	◆217	10/16/2017	08:40:50
15	◆217	10/16/2017	08:41:26
16	L:218	10/16/2017	08:42:06
17	M:254	10/16/2017	08:42:44
18	L:218	10/16/2017	08:43:20
19	M:254	10/16/2017	08:43:55
20	L:221	10/16/2017	08:44:32
21	L:222	10/16/2017	08:45:08
22	M:253	10/16/2017	08:45:45
23	L:197	10/16/2017	08:46:24
24	L:201	10/16/2017	08:46:59
25	M:255	10/16/2017	08:47:36
26	L:236	10/16/2017	08:48:13
27	M:167	10/16/2017	08:48:53
28	M:171	10/16/2017	08:49:26
29	L:246	10/16/2017	08:50:03
30	M:177	10/16/2017	08:50:40
31	L:241	10/16/2017	08:51:17
32	M:176	10/16/2017	08:51:54

Fig. 5. Mobile output

IV. WORKING PROCESS

A. RFID READER MODULE: EM-18 MODULE

The EM-18 RFID Reader Module will generate and radiates RF Carrier Signal of frequency 125 KHZ through its coils. When a passive RFID Tags (have no battery) is brought in contact to the RFID reader, the RFID will get energized from it. The RFID tag gets their power and master clock from electromagnetic fields that are produced by RFID Reader for its operation. In which they stores detail of vehicle license plate when it is brought to contact with the RFID reader.

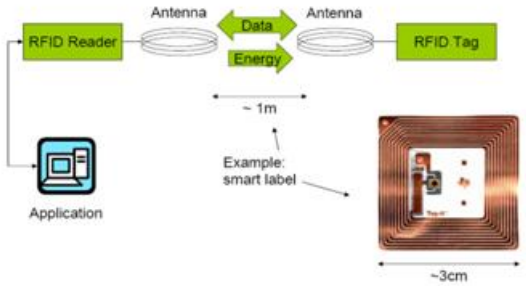


Fig.5. Passive RFID Reader

EM-18 RFID Reader Module which is used to determine the RFID tag in order to match the vehicle license plate number. When an RFID tag reached near the RFID module it makes a buffer sound. If the license plate number gets matched then the LCD display is used to display the keyword "LICENSE MATCHED". If the VLPR is not matched then LCD will display "NO MATCHES FOUND". Similarly, the driver individual license contains details of the vehicle owned by the driver if it's not matched then the data will be sent through IOT modem to the nearest police station to avoid theft. The information received from the LCD can be viewed through "mobile network" or through "personal computers".

B. IOT GSM MODEM

IOT has evolved from the convergence of wireless technologies, and the Internet. The concept may be referred to as the Internet of Everything. The internet of things (IOT) is based on the internetworking of exchanging data through cloud computing updating every information to a data logger, combining embedded into electronics, vehicles, buildings and through home application.

GPRS module uses 2G network in order to communicate through the cloud link and to access data the IOT modem is used as a Wi-Fi modem. It can communicate with controllers by commands such as ASCII characters like *, $ and # through hyper terminal. This IOT module can also be used to power ON or to reset the system software. They present an ultra-compact and reliable wireless module for SIM Com. This module uses SMT type, and is designed to benefit by its small dimensions and cost-effective solutions. By viewing based on industry standard, they deliver up to frequency of 900 MHz or 1800 MHz for transferring analyzed data by using low power consumption through IOT Modem. They are designed as a SIM slot, especially for slim and compact design in order to fulfill almost all the requirement.

Fig. 6. IOT Modem

In order to view this result in a Web Server ID link is provided as http://www.iotclouddata.com/project/520/iot16view.php.

Hence the vehicle movement and license plate number can be recognized.

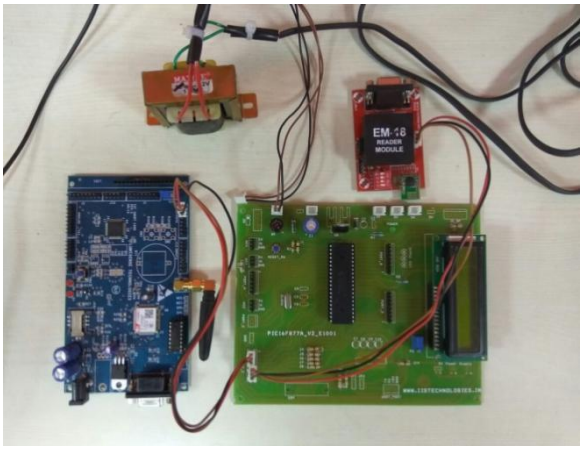


Fig. 7. Hardware Setup

V. RESULTS AND DISCUSSION

The aim of this paper is to develop a mechanism that could help to identify the vehicle movement and to check vehicle license plate. And also by inputting the vehicle details of each person in to their license identity that can be used to check whether the vehicle owned by the user or it's a theft vehicle. The main contributions this study has made for the data establishment analyzing and for transferring network information through IOT via an intelligent system. This system has a wide application value where the application of an IOT can be extended and the data can be applicable to other field of monitoring system.

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