A PROJECT REPORT
ON

"RFID BASED PRIVATE CAR PARKING SYSTEM"

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In Partial Fulfilment of the Requirement for the Award of

BACHELOR'S DEGREE IN ELECTRONICS AND TELECOMMUNICATION ENGINEERING

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CERTIFICATE

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is a record of bonafide work carried out by them, in the partial fulfilment of the requirement for the award of Degree of Bachelor of Engineering (Electronics and Telecommunication Engineering) at Modern Education Society's College of Engineering, Pune under the University of Pune. This work is done during year 2019-2020, under our guidance.

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ABSTRACT

Radio Frequency Identification (RFID) is one of the automatic identification and non line of site technology. In this technology communication is in between the tag and a reader. The tag is movable object like a smart card and any type of material object. Each tag have magnetic strip with a specific code which is read by RFID reader module. One RFID reader module can simultaneously communicate with a number of tags but one tag can communicate with only one RFID reader module at a time. In this project, we provide a private car parking entry system with the help of RFID technique. When the user shows, the RFID tag to RFID reader, the reader reads the code information which is available on the tag and with the help of microcontroller program memory, it displays the appropriate comment on LCD. If the code matches, the door opens and when IR sensor detects the car has passed it closes the door, which happens as programmed in the micro-controller. Else it remains closed, displaying the comment ”Outside members not allowed”.

By the application of this project, it is possible to see an unmanned, secure, automized private parking-lots, functioning with RFID technology in the future. Check-ins and check-outs will be handled in a fast manner without stopping the cars, and hence avoiding traffic jams.

Keywords: RFID reader, tags, micro-controller, secured, automation, future

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Chapter 1

Introduction

RFID stands for Radio Frequency Identification. RFID is one member in the family of Automatic Identification and Data Capture (AIDC) technologies and is a fast and reliable means of identifying objects. There are two main components: The Interrogator (RFID Reader) which transmits and receives the signal and the Transponder (tag) that is attached to the object. An RFID tag is composed of a miniscule microchip and antenna. RFID tags can be passive or active and come in a wide variety of sizes, shapes, and forms. The tag used in this project is a Passive tag. Communication between the RFID Reader and tags occurs wirelessly and generally does not require a line of sight between the devices. An RFID Reader can read through most anything with the exception of conductive materials like water and metal, but with modifications and positioning, even these can be overcome.

Figure 1.1: RFID tag

Today's technical world security is one of the main issue. Various types of securities are implemented with the help of technology. The RFID used in this project is the latest technology for identifying the authorized vehicle. There are different types

of RFID systems in the market. categorised on the basis of their frequency ranges. Some of the most commonly used RFID kits are low-frequency (30-500kHz), mid-frequency (900kHz-1500MHz) and high-frequency (2.4-2.5GHz).

When an authorized RFID Tag comes in front of RFID reader, the reader reads information about that vehicle from its unique RFID Tag and records into system. The main components of project are IR sensor, 89C52 microcontroller and RF module. We use 89C52 micro-controller as main controlling unit. It is high performance, low power, 8 bit microcontroller. RF module is used as transmitting and receiving unit. It is wireless, accessibility is fast and less time is wasted, accuracy is greater than 99% and cost is effective than running cables. The car was sensed by using IR sensor. This sensor detects car by using principle of photo-emission of IR LED. In this project we proposed following working:
1)Interface RFID module for sending message to microcontroller.
2)Interface LCD display to display the commments.
3)Interface IR sensor to detect car.

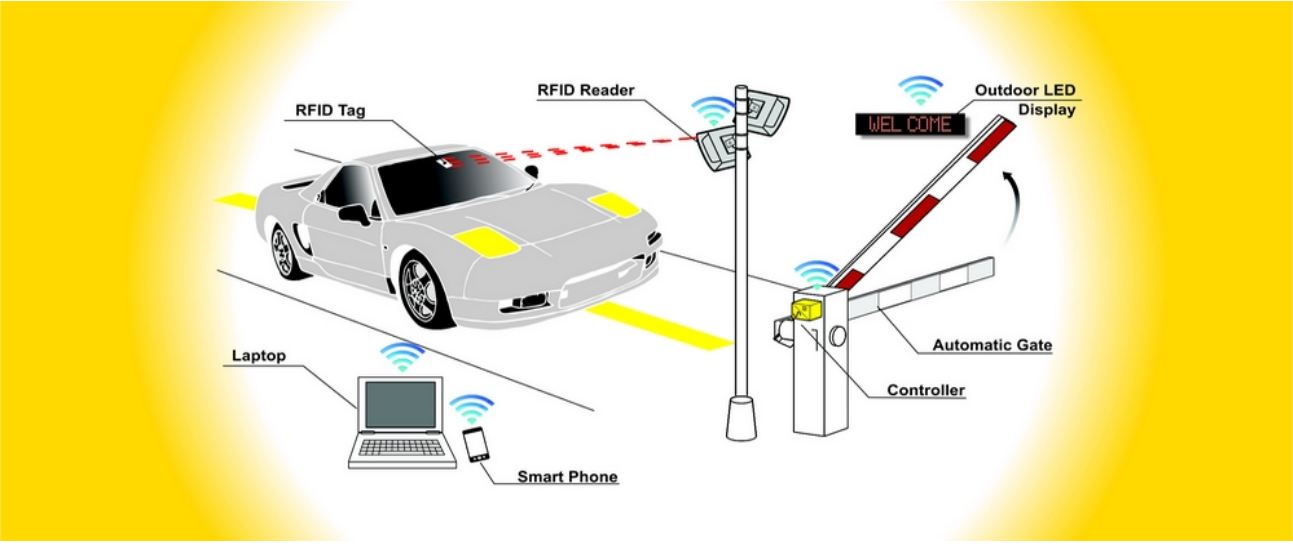

Figure 1.2: Project depiction

Chapter 2

Literature Survey

2.1 Analysis And Research

RFID technology has several applications beyond the retail sector. RFID tags are embedded in passports for security and personal identification. In ID cards to control access to company buildings and hotels. Tags are used for electronic payment for transportation system and other payment systems, for example credit cards and smart cards. It has several medical uses including tracking of new born babies in hospital, storing information of surgical patients, procedures, and tracking medical equipment.

RFID systems are used in toll collection, transport payments and logistics management systems by using conventional RFID system. When the capability of RF communication is accurately analyzed, it can be seen that there are more possibilities beyond that. After considering the characteristics and behaviors of RF communication, it is possible to design some new applications that improve the safety, security, comfortability, and productivity in eco-friendly manner.

This project uses contactless smart card containing RFID tag to prevent the entries of unwanted persons. Contactless smart card has some information stored in it which can be a unique code or the peronal details. When it come in the field of RFID reader, the reader reads the information stored in the card. Reader recognizes information and match with the information stored in it .If these information match, it will allow the card user to enter inside the parking area. If reader does not find information inside tag matching with the one in its memory it will not allow that person to enter.

2.2 Methodology

2.2.1 Operating Principle

RFID systems operating in low frequency range operates on principle of near field coupling between tag and reader. In operating principle of RFID, Faraday's principle of electromagnetic induction is the basis of near field coupling. In near field RFID system, electromagnetic waves are transmitted by reader or interrogator which propagates outwards with spherical wave front. Tags placed within field collect some energy. Then exchange of data between tag and reader takes place. The amount of energy available at any particular point is related to distance from the transmitter as expressed as 1/d where 'd' is distance from the transmitter

2.2.2 Block Diagram

When RFID card is read, RF module uses Radio Frequency (RF) transmitter which is a single bit transmitter. It works on 433 MHz frequency. With the help of antenna, RF transmitter convert electrical signal into electromagnetic signal. At the receiver side, RF receiver is used to convert Electromagnetic (EM) signal into electrical signal. When the signal reaches microcontroller, further excecution is carried out i.e. signal is given to motor driver IC, to open the gates using motor. While opening the gates, member slot number and name is displayed on the LCD screen.

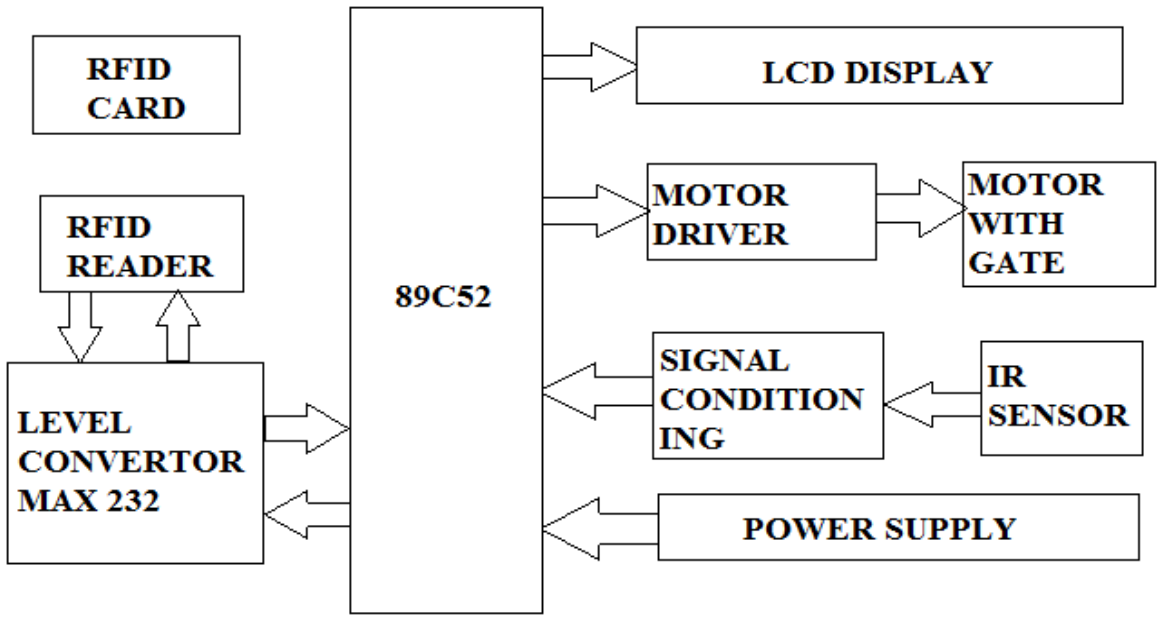

Figure 2.1: Block Diagram

For sensing whether the car has passed, an IR sensor is used, which works on the principle of photo-emission. Its output is given to the comparator. Comparator compares the sensed output with predefined threshold level. Once the photo detection stops, the signal is given again to close the gates.

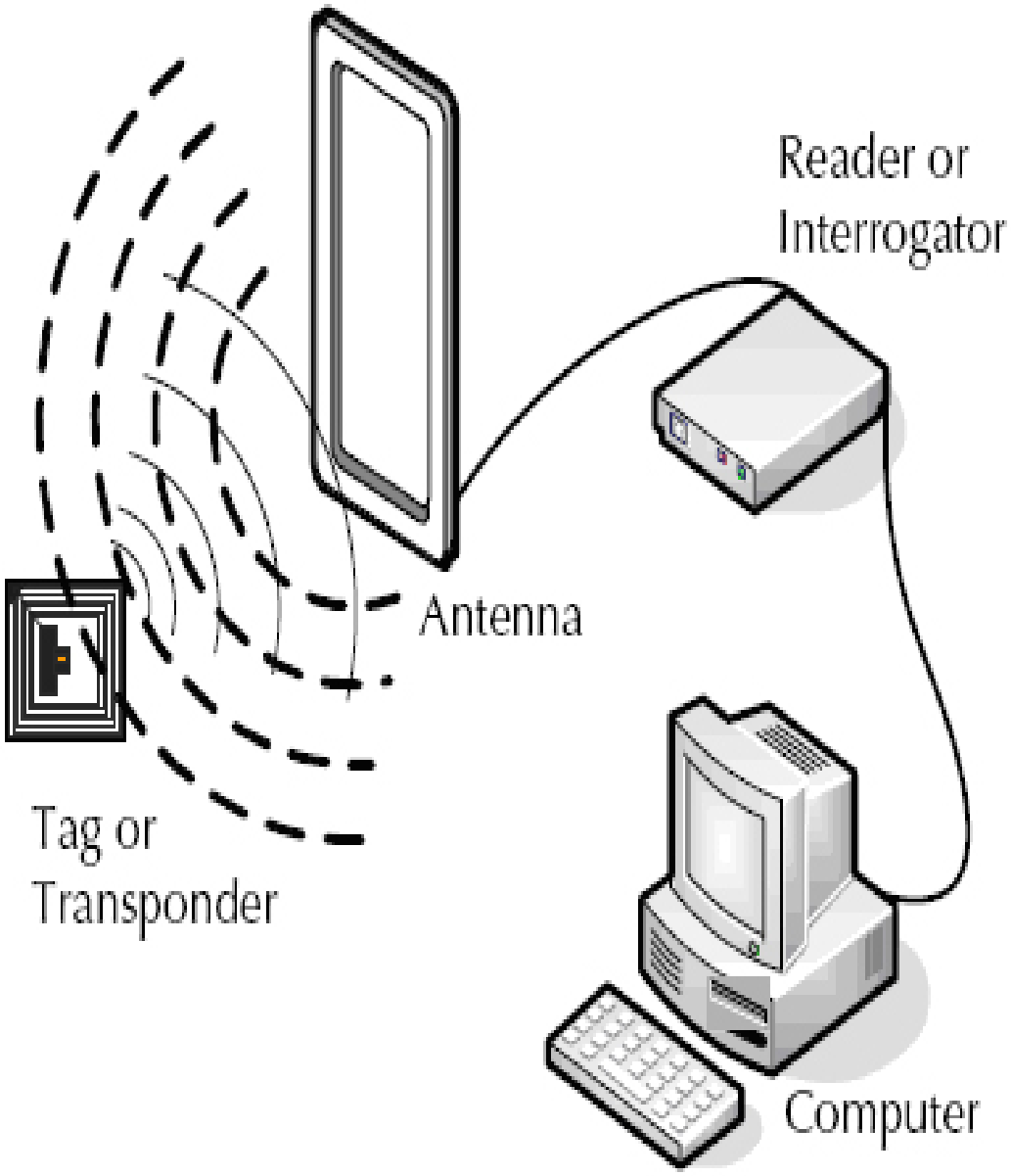

Figure 2.2: RFID Working

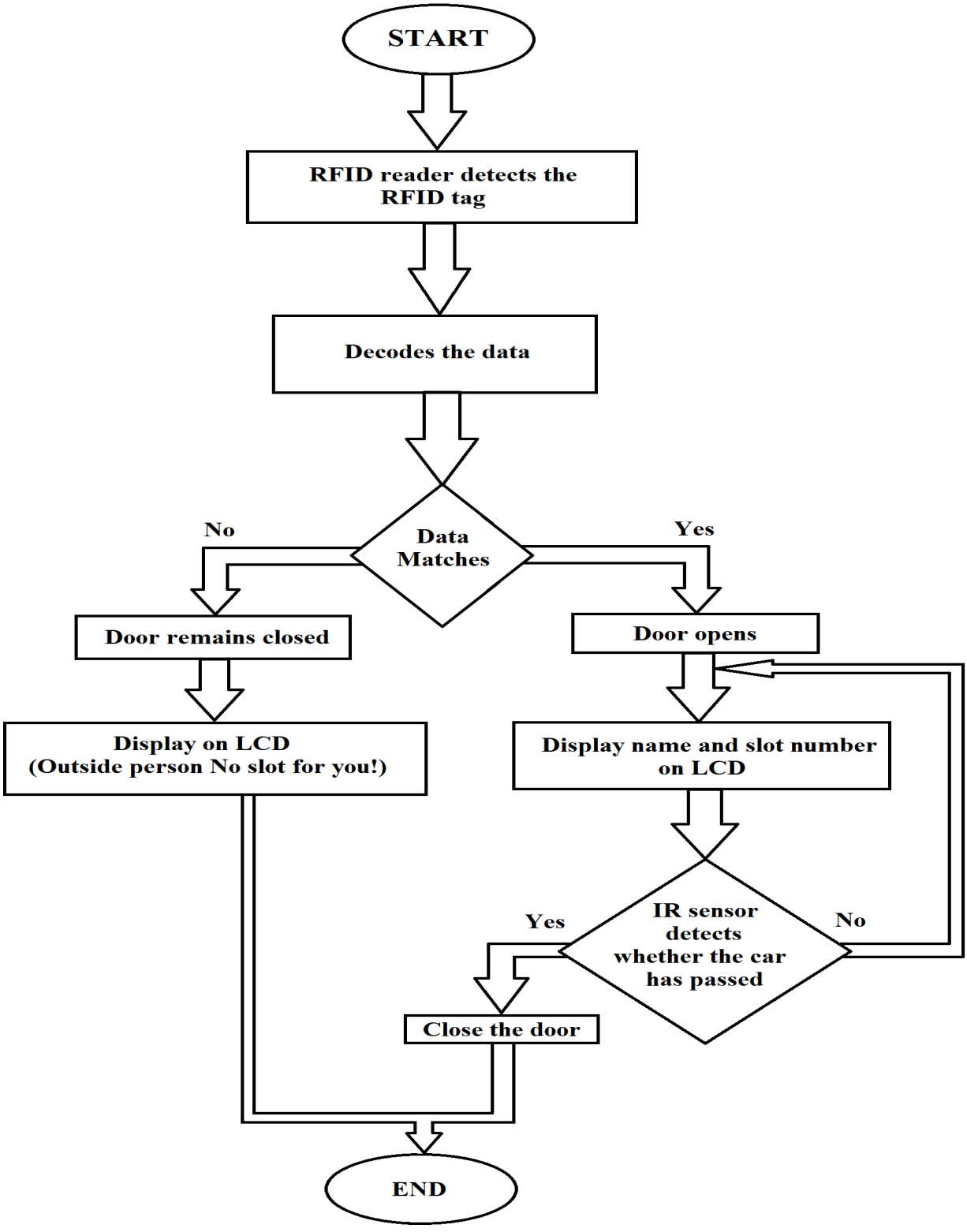

Figure 2.3: Flow Chart

2.3 Circuit Diagram

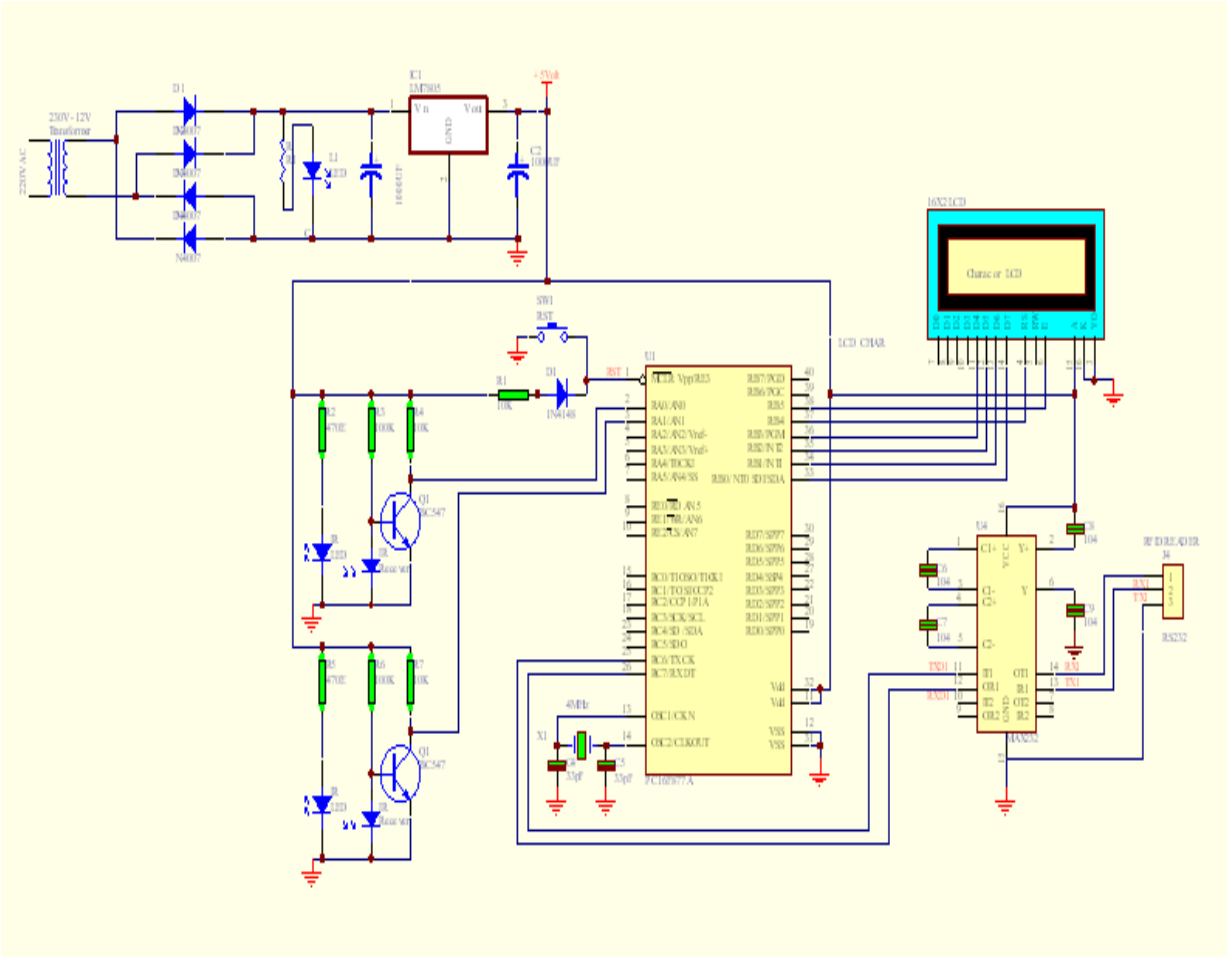

Figure 2.4: Circuit Diagram

Chapter 3

Hardware Specifications

3.1 Microcontroller (89C52)

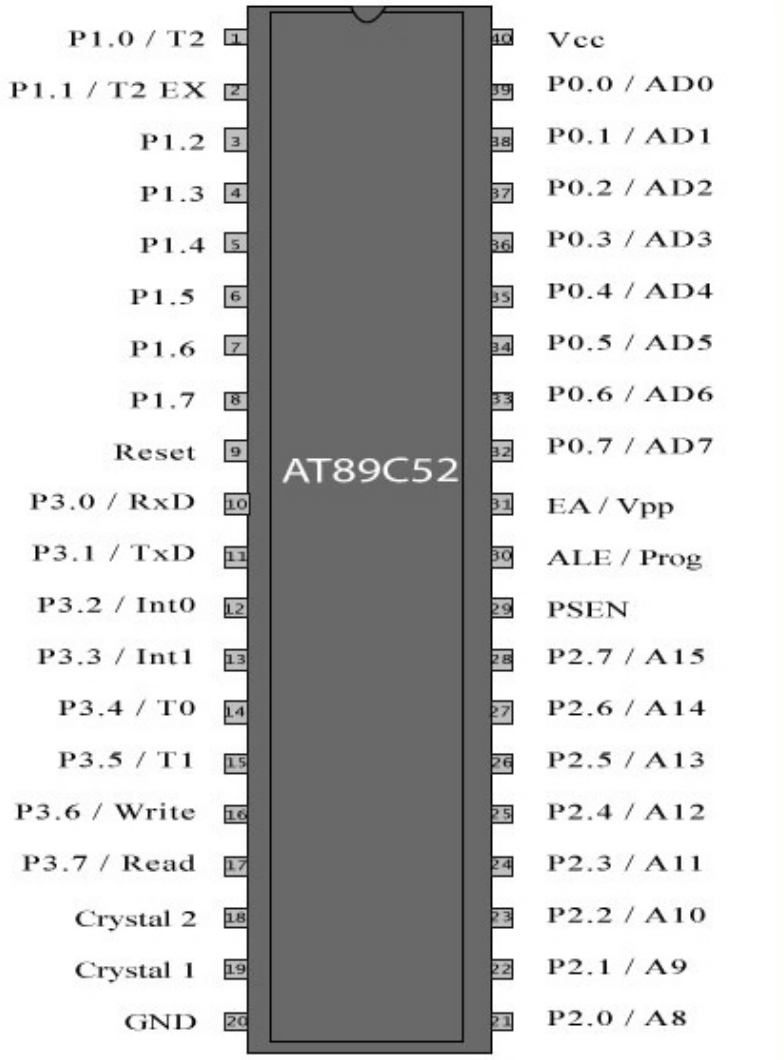

Figure 3.1: 89C52 Pin Diagram

The AT89C52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM).

The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 and 80C52 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C52 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.

3.1.1 Pin Description

Pin Number	Pin Name	Description
1	P1.0 (T2)	Timer/Counter or 0th GPIO pin of PORT 1
2	P1.1 (T2.EX)	Timer/Counter/External Counter or 1st GPIO pin of PORT 1
3	P1.2	2nd GPIO pin of PORT 1
4	P1.3	3rd GPIO pin of PORT 1
5	P1.4	4th GPIO pin of PORT 1
6	P1.5 (MOSI)	MOSI for in System Programming or 5th GPIO pin of PORT 1
7	P1.6 (MISO)	MISO for in System Programming or 6th GPIO pin of PORT 1
8	P1.7 (SCK)	SCK for in System Programming or 7th GPIO pin of PORT 1
9	RST	Making this pin high will reset the Microcontroller
10	P3.0 (RXD)	RXD Serial Input or 0th GPIO pin of PORT 3
11	P3.1 (TXD)	TXD Serial Output or 1st GPIO pin of PORT 3
12	P3.2 (INT0')	External Interrupt 0 or 2nd GPIO pin of PORT 3
13	P3.3 (INT1')	External Interrupt 1 or 3rd GPIO pin of PORT 3
14	P3.4 (T0)	Timer 0 or 4th GPIO pin of PORT 3
15	P3.5 (T1)	Timer 1 or 5th GPIO pin of PORT 3
16	P3.6 (WR')	Memory Write or 6th GPIO pin of PORT 3
17	P3.7 (RD')	Memory Read or 7th GPIO pin of PORT 3
18	XTAL2	External Oscillator Output
19	XTAL1	External Oscillator Input
20	GND	Ground pin of MCU
21	P2.0(A8)	0th GPIO pin of PORT 2
22	P2.1 (A9)	1st GPIO pin of PORT 2
23	P2.2 (A10)	2nd GPIO pin of PORT 2
24	P2.3 (A11)	3rd GPIO pin of PORT 2
25	P2.4 (A12)	4th GPIO pin of PORT 2
26	P2.5 (A13)	5th GPIO pin of PORT 2
27	P2.6 (A14)	6th GPIO pin of PORT 2
28	P2.7 (A15)	7th GPIO pin of PORT 2
29	PSEN'	Program store Enable used to read external program memory
30	ALE / PROG'	Address Latch Enable / Program Pulse Input
31	EA' / VPP	External Access Enable / Programming enable Voltage
32	P0.7 (AD7)	Address / Data pin 7 or 7th GPIO pin of PORT 0
33	P0.6 (AD6)	Address / Data pin 6 or 6th GPIO pin of PORT 0
34	P0.5 (AD5)	Address / Data pin 5 or 5th GPIO pin of PORT 0
35	P0.4 (AD4)	Address / Data pin 4 or 4th GPIO pin of PORT 0

Pin Number	Pin Name	Description
36	P0.3 (AD3)	Address / Data pin 3 or 3rd GPIO pin of PORT 0
37	P0.2 (AD2)	Address / Data pin 2 or 2nd GPIO pin of PORT 0
38	P0.1 (AD1)	Address / Data pin 1 or 1st GPIO pin of PORT 0
39	P0.0 (AD0)	Address / Data pin 0 or 0th GPIO pin of PORT 0
40	VCC	Positive pin of MCU (+5V)

3.1.2 Features

a. 8K Bytes of In-System Reprogrammable Flash Memory

b. Endurance: 1,000 Write/Erase Cycles

c. Fully Static Operation: 0 FIz to 24 MHz

d. Three-level Program Memory Lock

e. 256 x 8-bit Internal RAM

f. 32 Programmable I/O Lines

g. Three 16-bit Timer/Counters

h. Six Interrupt Sources

i. Programmable Serial Channel

j. Low-power Idle and Power-down Modes

3.2 RFID-Card

Figure 3.2: RFID Card

An RFID tag consists of an integrated circuit and an antenna. The tag is also composed of a protective material that holds the pieces together and shields them from various environmental conditions. The protective material depends on the application. For example, employee ID badges containing RFID tags are typically made from durable plastic, and the tag is embedded between the layers of plastic.

RFID tags come in a variety of shapes and sizes and are either passive or active. Passive tags are the most widely used, as they are smaller and less expensive to implement. Passive tags must be "powered up" by the RFID reader before they can transmit data. Unlike passive tags, active RFID tags have an onboard power supply (e.g., a battery), thereby enabling them to transmit data at all times.

We have used a passive tag, because it is cost efficient, light and requires less space as compared to active cards.

3.2.1 Passive Tags

Passive tags are comprised of three elements: an integrated circuit or chip, an antenna, and a substrate.

The RFID chip stores data and perform specific tasks. Depending on its design, the chip may be read-only (RO), write-once, read-many (WORM), or read-write (RW). Typically, RFID chips carry 96 bits of memory but can range from 2-1000 bits.

Attached to the chip is the second component, the antenna, whose purpose is to absorb radio-frequency (RF) waves from the reader's signal and to send and receive data. Passive RFID tag performance is strongly dependent on the antenna's size: the larger the antenna, the more energy it can collect and then send back out. Larger antennas, therefore, have higher read ranges (although not as high as those of active tags). Antenna shape is also important to the performance of the tag. Low- and high-frequency (LF and HF, respectively) antennas are usually coils because these frequencies are predominantly magnetic in nature. Ultrahigh-frequency (UHF) antennas, on the other hand, look similar to old-fashioned TV antennas ("rabbit ears") because ultrahigh frequencies are solely electric in nature.

The third component of a passive RFID tag is called a substrate, which is commonly a Mylar or plastic film. Both the antenna and the chip are attached to the substrate, which may be thought of as the "glue" that holds all of the tag's pieces together.

3.3 RFID-Reader

Figure 3.3: RFID Reader/Interrogators

Also called interrogators, these are the devices that transmit and receive radio waves in order to communicate with RFID tags. RFID readers are typically divided into two distinct types – Fixed RFID Readers and Mobile RFID Readers. Fixed readers stay in one location and are typically mounted on walls, on desks, into portals, or other stationary locations.

Fixed readers are generally two-port, four-port, or eight-port, high performance readers. These readers are the 'workhorses' in the industry because they provide high power and receive sensitivity to non-mobile applications. Integrated readers are a subset of fixed readers and are unique because they are a reader and antenna combined into one unit. Integrated readers may have one additional port, are usually non-mobile, and are medium- to high-performance readers depending on the specific unit.

The first subset of mobile readers can be classified as mobile computers, which also have an integrated antenna. No additional antenna ports are available on these readers, but there are plenty of other features, like onboard processing, that enable these readers to run various programs while maintaining high read rates. Sleds, a

second subset of mobile readers, are small RFID readers that connect to a smart device through Bluetooth or an auxiliary port and use a downloaded or custom-developed mobile application in order to function.

3.4 Motor Driver (IC L293D)

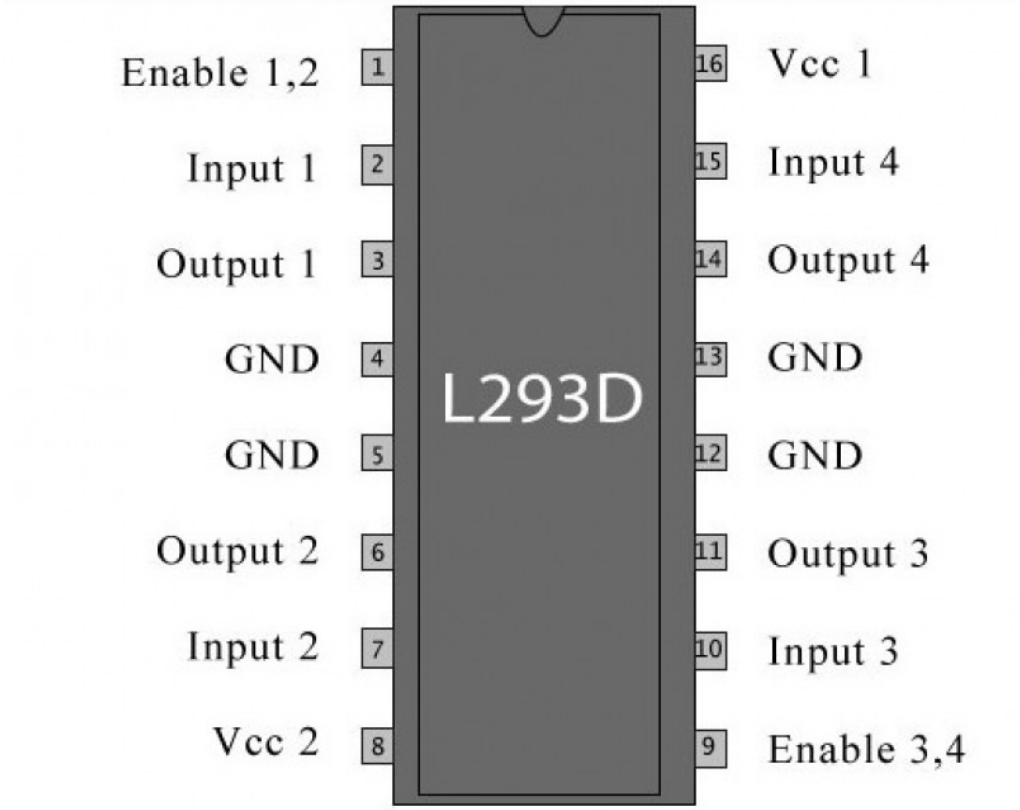

Figure 3.4: L293D IC

The L293D is a popular 16-Pin Motor Driver IC. As the name suggests it is mainly used to drive motors. A single L293D IC is capable of running two DC motors at the same time; also the direction of these two motors can be controlled independently. So if you have motors which has operating voltage less than 36V and operating current less than 600mA, which are to be controlled by digital circuits like Op-Amp, 555 timers, digital gates or even Micro-controllers like Arduino, PIC, ARM, 8051, etc.. this IC will be the right choice for you.

Pin Number	Pin Name	Description
1	Enable 1,2	This pin enables the input pin Input 1(2) and Input 2(7)
2	Input 1	Directly controls the Output 1 pin. Controlled by digital circuits
3	Output 1	Connected to one end of Motor 1
4	Ground	Ground pins are connected to ground of circuit (0V)
5	Ground	Ground pins are connected to ground of circuit (0V)
6	Output 2	Connected to another end of Motor 1
7	Input 2	Directly controls the Output 2 pin. Controlled by digital circuits
8	Vcc2 (Vs)	Connected to Voltage pin for running motors (4.5V to 36V)
9	Enable 3,4	This pin enables the input pin Input 3(10) and Input 4(15)
10	Input 3	Directly controls the Output 3 pin. Controlled by digital circuits
11	Output 3	Connected to one end of Motor 2
12	Ground	Ground pins are connected to ground of circuit (0V)
13	Ground	Ground pins are connected to ground of circuit (0V)
14	Output 4	Connected to another end of Motor 2
15	Input 4	Directly controls the Output 4 pin. Controlled by digital circuits
16	Vcc2 (Vss)	Connected to +5V to enable IC function

3.4.1 Features

a. Can be used to run Two DC motors with the same IC.

b. Speed and Direction control is possible

c. Motor voltage Vcc2 (Vs): 4.5V to 36V

d. Maximum Peak motor current: 1.2A

e. Maximum Continuous Motor Current: 600mA

f. Supply Voltage to Vcc1(vss): 4.5V to 7V

g. Transition time: 300ns (at 5Vand 24V)

h. Automatic Thermal shutdown is available

i. Available in 16-pin DIP, TSSOP, SOIC packages

3.5 Level convertor (MAX 232)

The MAX232 IC is a 16 pin IC used as a level convertor. The controller operates at Transistor Transistor Logic (TTL) logic level (0-5V) whereas the serial communication in PC works on RS232 standards (-25 V to + 25V). This makes it difficult to establish a direct link between them to communicate with each other.The intermediate link is provided through MAX232. It is a dual driver/receiver that includes

a capacitive voltage generator to supply RS232 voltage levels from a single 5V supply. Each receiver converts RS232 inputs to 5V TTL/CMOS levels. These receivers (R1 & R2) can accept 30V inputs. The drivers (T1 & T2), also called transmitters, convert the TTL/CMOS input level into RS232 level.

MAX232 Pinout consists of 16 pins in total, the first 6 Pins are used to connect capacitors while the next 8 Pins are for serial port connections and the last two Pins are Power Pins.

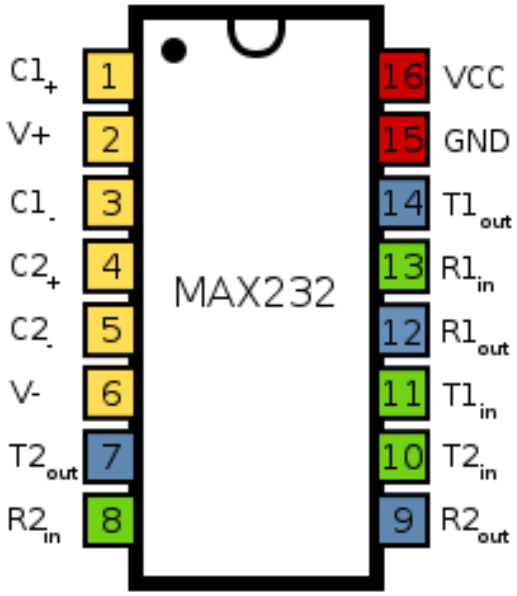

Figure 3.5: Level convertor

3.5.1 Features

a. Meets or Exceeds TIA/EIA-232-F and ITU Recommendation V.28.

b. Operates From a Single 5-V Power Supply With 1.0-F Charge-Pump Capacitors.

c. Operates Up To 120 kbit/s.

d. Two Drivers and Two Receivers 30-V Input Levels.

e. Low Supply Current . . . 8 mA Typical.

f. ESD Protection Exceeds JESD 22 2000-V Human-Body Model (A114-A).

g. Upgrade With Improved ESD (15-kV HBM).

3.6 Infrared (LTH1550) sensor

Figure 3.6: IR LTH1550 Sensor

For sensing the car we are using LTH1550 sensor. This sensor has IR transmitter and IR Receiver. IR signal use to detect the car by measuring intensity of reflected signal. By using this sensor and its related circuit diagram we can control the gate of parking system.

3.6.1 Specifications

a. Product Category: Optical Switches, Reflective, Phototransistor Output.

b. Sensing Distance: 3.81 mm.

c. Collector- Emitter Voltage VCEO Max: 30 V.

d. Maximum Collector Current: 20 mA.

e. Forward Voltage: 1.2 V.

f. Reverse Voltage: 5 V.

g. Power Dissipation:100 mW

h. Minimum Operating Temperature:- 25 C

i. Maximum Operating Temperature:+ 85 C

3.6.2 Features

a. Non-contact switching

b. For direct pc board or dual-in-line socket mounting

c. Fast switching speed

d. Reflective object sensor

e. Reflective line sensor

3.7 LCD

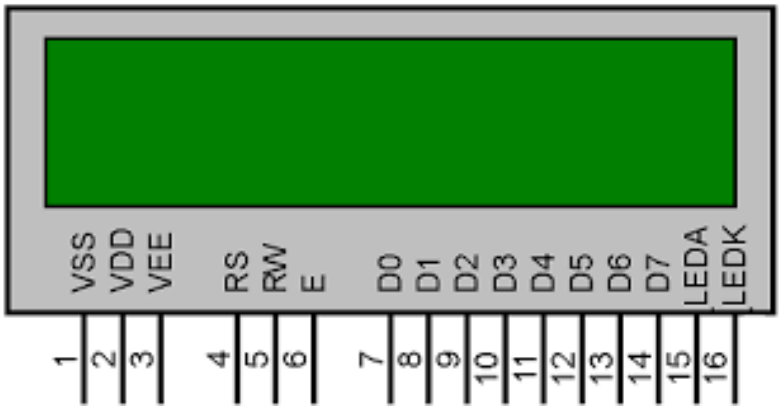

Figure 3.7: 16x2 LCD

It is used to display the current status of the system and the message to the users.

3.7.1 Features

a. Operating Voltage is 4.7V to 5.3V

b. Current consumption is 1mA without backlight

c. Alphanumeric LCD display module, meaning can display alphabets and numbers

d. Consists of two rows and each row can print 16 characters.

e. Each character is build by a 58 pixel box

f. Can work on both 8-bit and 4-bit mode

g. It can also display any custom generated characters

h. Available in Green and Blue Backlight

Chapter 4

KEIL Simulation

4.1 KEIL Simukation with working

4.1.1 On clicking the play button

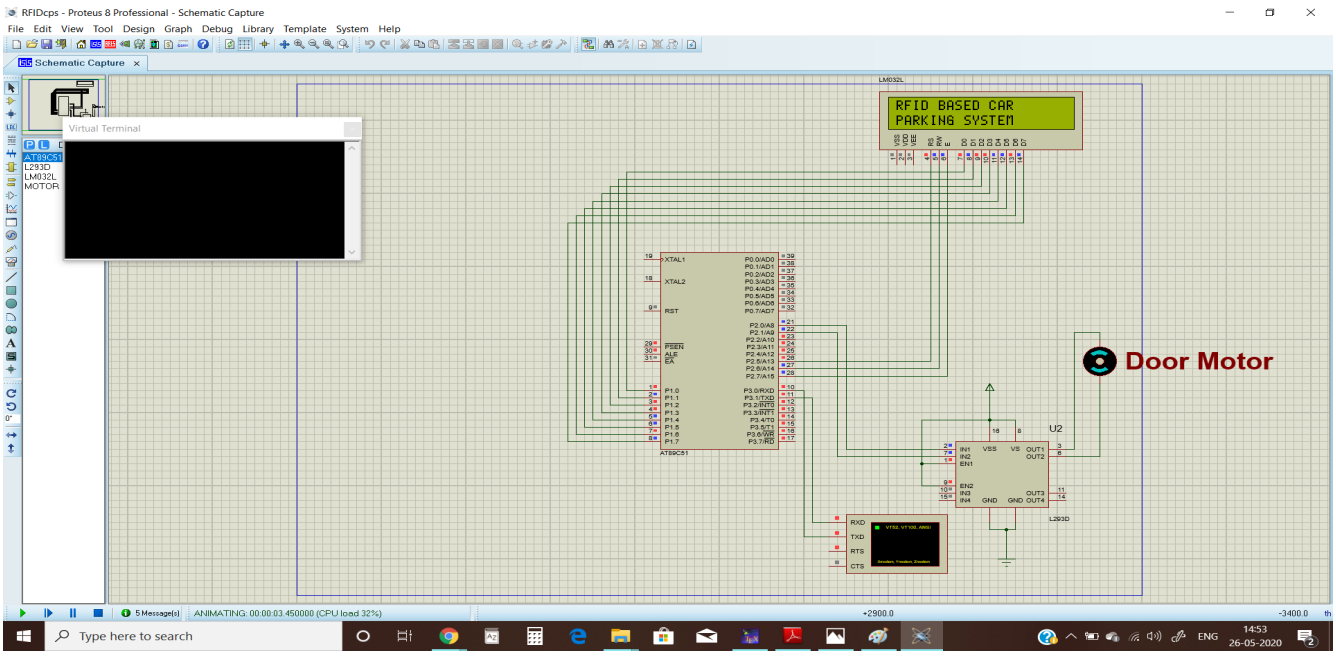

Figure 4.1: Intro

4.1.2 Asks to swipe the card

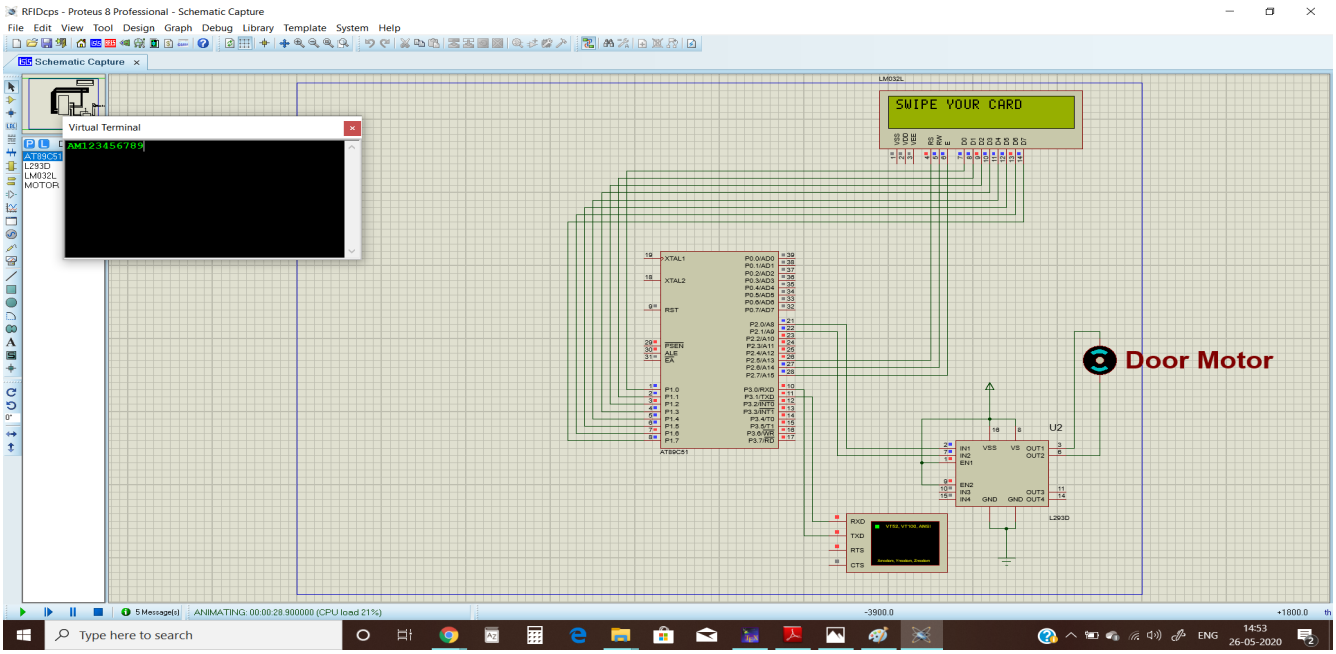

Figure 4.2: Enter the unique code in terminal

4.1.3 When the code matches

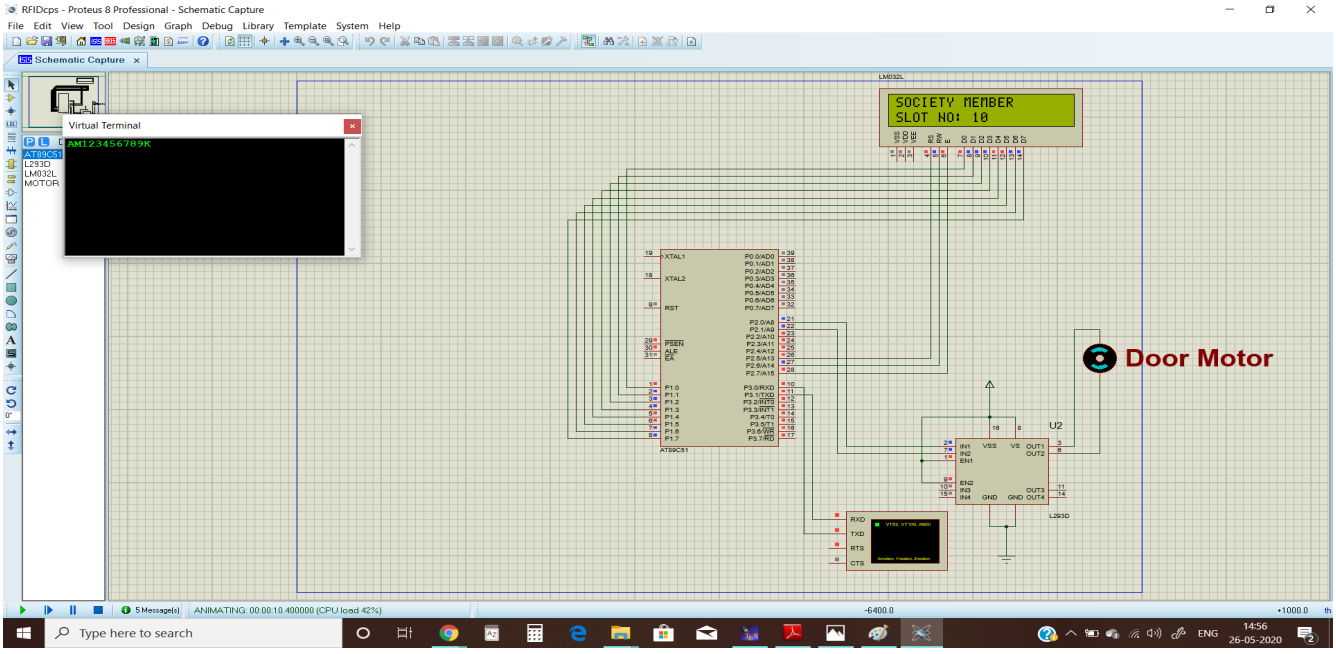

Figure 4.3: Displays the slot number

4.1.4 Door opens

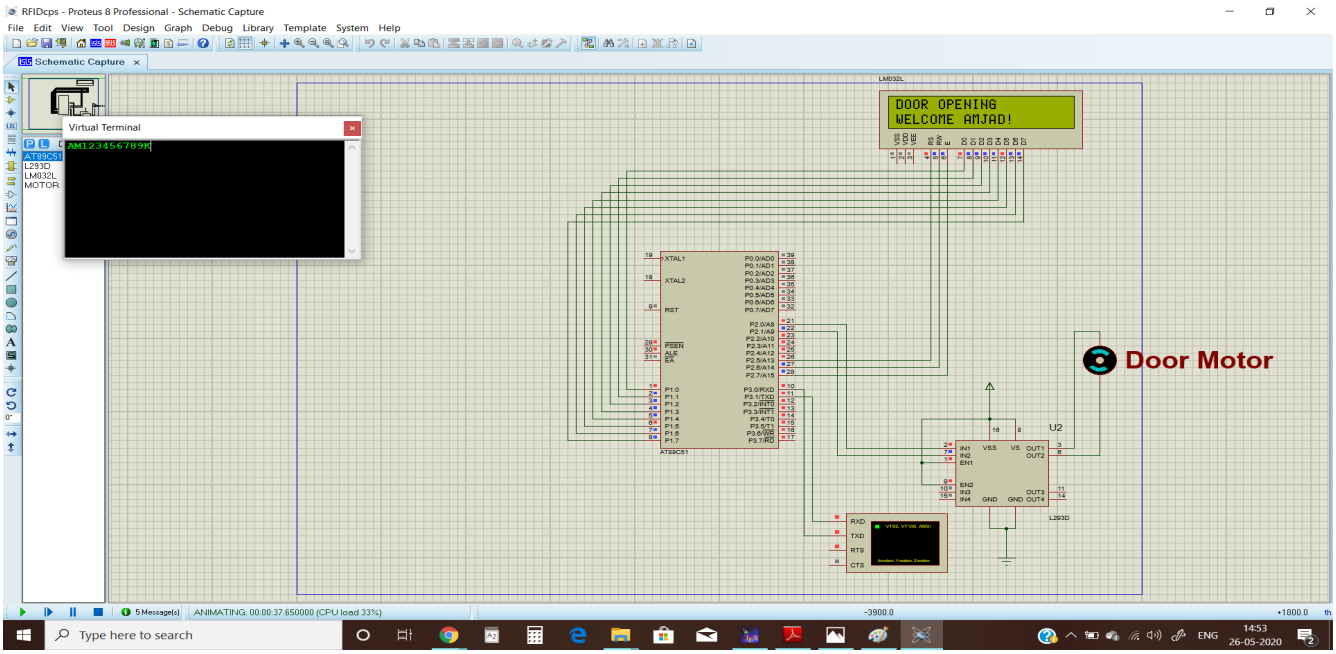

Figure 4.4: Displays the name

4.1.5 After some delay the door closes

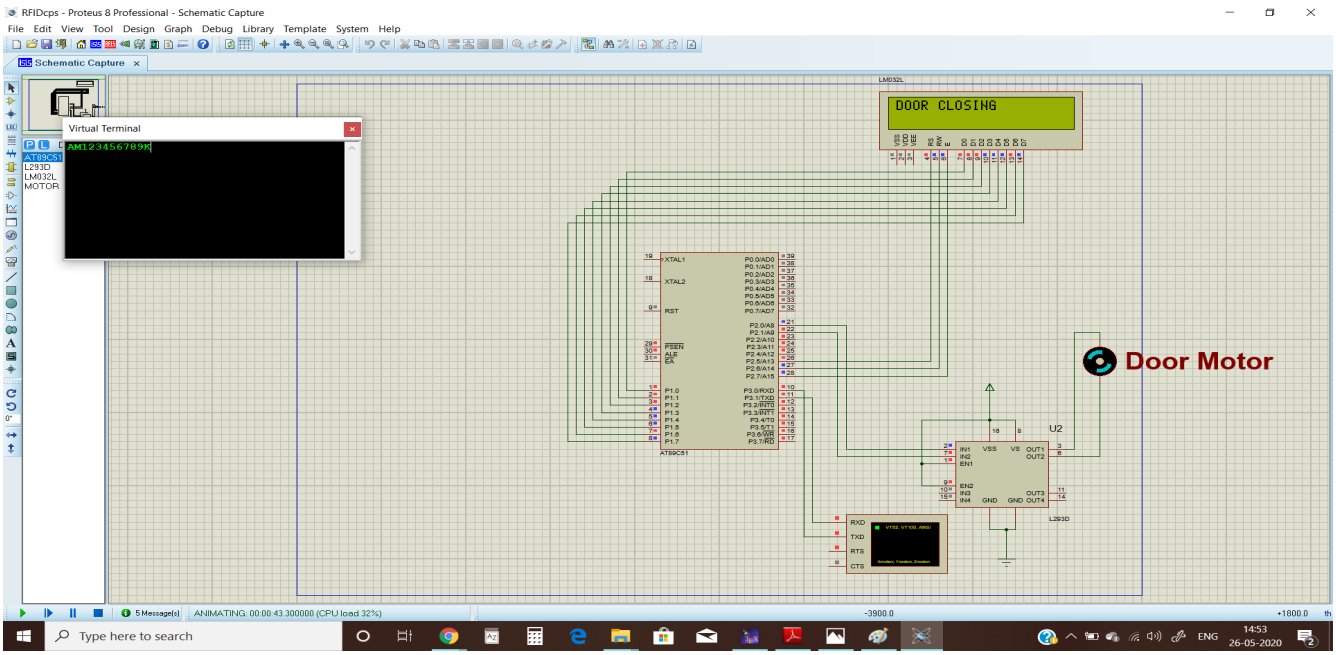

Figure 4.5: In actual it closes after detecting car has passed

4.1.6 If the code doesn't match

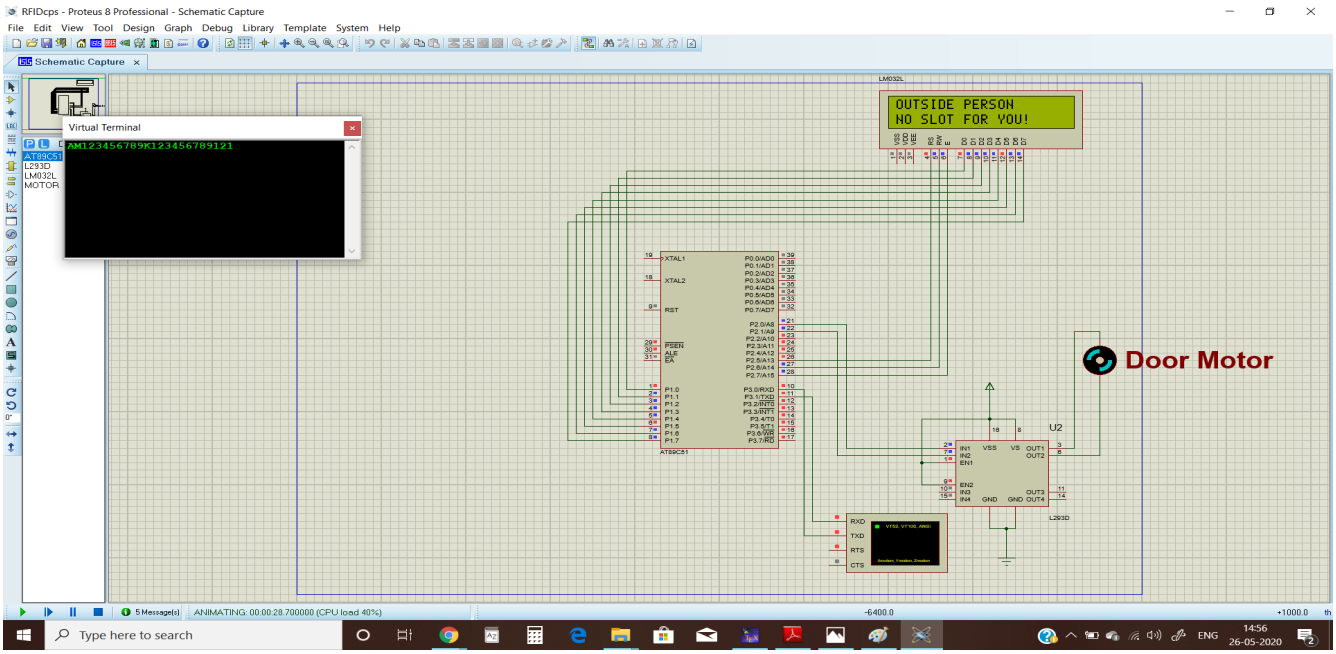

Figure 4.6: Door remains closed

4.1.7 Algortihm

Step 1: Start

Step 2: Read RFID card

Step 3: Check data match

Step 4: If data matches - Rotate the motor and display the user I'd and name on LCD screen

Step 5: Stop the motor

Step 6: If IR sensor gives low output, rotate the motor in reverse.

Step 7: Stop the motor

Step 8: If the data does not match - Display the text (Outside member No slot for you)

Step 9: End

4.1.8 C Program

```
#include<reg51.h>
sbit doorp = P2^0;              //door motor which rotates clockwise or anti
    clockwise to open or close
sbit doorn = P2^1;
sbit rs = P2^5;                 //lcd control line connections: Resistor select
    control line
sbit rw = P2^6;                 //read write connection
```

```
sbit en = P2^7;                 //enable pin  all declared with Sbit
void lcddat(unsigned char);     //function to pass character by character to lcd
   display
void lcdcmd(unsigned char);       //function to pass command to lcd
void lcddis(unsigned char *); //function to display on lcd screen
void lcd_init();                //to send all the commands required for
   initialization
void serial_init();             //function to write serial communication steps to
   initiate serial communication between RFID and Micro controller
void check();                   //to check whether the person is existing person
void delay();                   //for lcd and operation
void mdelay();                  //for motor operation
unsigned char rfid[12],v1;      //declaration of 12 digit RFID tag and a temperory
    variable
void main()
{
doorp = doorn = 0;            //initialize with 0 for 2 motor controls, which
   gives no response
serial_init();                  //Described below in the function definition
lcd_init();                     //Described below in the function definition
lcddis("RFID BASED CAR");
lcdcmd(0xc0);                   //Sending cursor to second line
lcddis("PARKING SYSTEM");
mdelay();
lcdcmd(0x01);                   //Clear the text
while(1)
{
lcdcmd(0x01);                 //Next repetition
lcddis("SWIPE YOUR CARD");
for(v1=0;v1<12;v1++)          //Read 12 digits
{
while(RI == 0);             //RI=1 means Data is received from RFID to micro
   controller
rfid[v1] = SBUF;            //transfer SBUF Data to rfid variable
RI = 0;
SBUF = rfid[v1];            //re transmission (optional)
while(TI == 0);
TI = 0;
}
check();
}
}

void check()
{ //1A3465B89356   SHARMA SLOT
if(rfid[0]=='A'&&rfid[1]=='M'&&rfid[2]=='1'&&rfid[3]=='2'&&rfid[4]=='3'
&&rfid[5]=='4'&&rfid[6]=='5'&&rfid[7]=='6'&&rfid[8]=='7'&&rfid[9]=='8'&&rfid
   [10]=='9'&&rfid[11]=='K')
{
lcdcmd(0x01);
lcddis("SOCIETY MEMBER");
lcdcmd(0xc0);
lcddis("SLOT NO: 101");
delay();
```

```
53 delay();
54 delay();
55 lcdcmd(0x01);
56 doorp = 1; doorn = 0;        //clockwise direction to open door
57 lcddis("DOOR OPENING");
58 lcdcmd(0xc0);
59 lcddis("WELCOME AMJAD!");
60 mdelay();
61 doorp = 0; doorn = 0;
62 mdelay();
63 lcdcmd(0x01);
64 doorp = 0; doorn = 1;
65 lcddis("DOOR CLOSING");
66 mdelay();
67 doorp = 0; doorn = 0;
68 }
69
70 else if(rfid[0]=='R'&&rfid[1]=='U'&&rfid[2]=='1'&&rfid[3]=='2'&&rfid[4]=='3'
71 &&rfid[5]=='4'&&rfid[6]=='5'&&rfid[7]=='6'&&rfid[8]=='7'&&rfid[9]=='8'&&rfid
    [10]=='9'&&rfid[11]=='S')
72 {
73 lcdcmd(0x01);
74 lcddis("SOCIETY MEMBER");
75 lcdcmd(0xc0);
76 lcddis("SLOT NO: 102");
77 delay();
78 delay();
79 delay();
80 lcdcmd(0x01);
81 doorp = 1; doorn = 0;        //clockwise direction to open door
82 lcddis("DOOR OPENING");
83 lcdcmd(0xc0);
84 lcddis("WELCOME RUTIKA!");
85 mdelay();
86 doorp = 0; doorn = 0;
87 mdelay();
88 lcdcmd(0x01);
89 doorp = 0; doorn = 1;
90 lcddis("DOOR CLOSING");
91 mdelay();
92 doorp = 0; doorn = 0;
93 }
94
95 else if(rfid[0]=='R'&&rfid[1]=='U'&&rfid[2]=='1'&&rfid[3]=='2'&&rfid[4]=='3'
96 &&rfid[5]=='4'&&rfid[6]=='5'&&rfid[7]=='6'&&rfid[8]=='7'&&rfid[9]=='8'&&rfid
    [10]=='9'&&rfid[11]=='J')
97 {
98 lcdcmd(0x01);
99 lcddis("SOCIETY MEMBER");
100 lcdcmd(0xc0);
101 lcddis("SLOT NO: 103");
102 delay();
103 delay();
104 delay();
```

```
lcdcmd(0x01);
doorp = 1; doorn = 0;        //clockwise direction to open door
lcddis("DOOR OPENING");
lcdcmd(0xc0);
lcddis("WELCOME RUTUJA!");
mdelay();
doorp = 0; doorn = 0;
mdelay();
lcdcmd(0x01);
doorp = 0; doorn = 1;
lcddis("DOOR CLOSING");
mdelay();
doorp = 0; doorn = 0;
}

else
{
lcdcmd(0x01);
lcddis("OUTSIDE PERSON");
lcdcmd(0xc0);
lcddis("NO SLOT FOR YOU!");
mdelay();
}
}

void lcd_init()
{
lcdcmd(0x38); //initialises crystal 5x7 matrix
lcdcmd(0x01); //clear screen
lcdcmd(0x10); //shift cursor position to right
lcdcmd(0x0c); //display on cursor off
lcdcmd(0x80); //start display from 1st line
}

void lcdcmd(unsigned char val)
{
P1 = val; //P1 is connected to all Data lines from D0 to D7
rs = 0;
rw = 0;
en = 1;    //Enable pin high to low to allow next command
delay();
en = 0;
}

void lcddat(unsigned char val)
{
P1 = val;
rs = 1;
rw = 0;
en = 1;
delay();
en = 0;
}

```

```
159 void delay()
160 {
161 unsigned int v5;
162 for(v5=0;v5<10000;v5++);
163 }
164
165 void lcddis(unsigned char *s)
166 {
167 unsigned char w;
168 for(w=0;s[w]!='\0';w++)
169 {
170 lcddat(s[w]);
171 }
172 }
173
174 void serial_init()
175 {
176 SCON = 0X50;  //Initiates serial communication
177 TMOD = 0X20;  //Select Timer 1 in Mode 2 by use of TMOD Register
178 TH1 =  3;     //baud rate = 9600
179 TR1 = 1;      //Start Timer
180 }
181
182 void mdelay()
183 {
184 unsigned int v6,v7;
185 for(v6 = 0;v6<2;v6++)
186 {
187 for(v7 = 0;v7<40000;v7++);
188 }
189 }
```

Chapter 5

Conclusion

5.1 Advantages

- Accurately identify and authorize vehicle movement
- Collect and record vehicle movement data
- Analyze traffic patterns to maximize facility utilization
- Increase security within the parking facility
- Manage staffing for peak traffic periods
- Save time for parking
- Improve customer service

5.2 Dis-Advantages

- When we go first time to parking system require more time for parking.
- When Card is lost then this card can be used by another person.

5.3 Future Enhancements

- A buzzer can be added, so that it will start if an unauthorized person is detected.
- IOT can be applied to keep the record of all the activities.

5.4 Conclusion

This project utilizes the password by RFID card. The system will provide excellent security, avoid accident in parking area and get accurate information about parking. This system aims at saving a large amount of man-hours caused by problems those are created in parking area, where prevention can save lives and property. By using project we can avoid the robbery. We can also reduce the congestion of the traffic in parking area as well as the vehicle thefts. We can create project using electronic devices, hardware, real time application and software knowledge.. RFID is increasingly used as biometric technologies for security purpose. The advantage of all types of RFID systems is the non-contact, non-line-of-sight in nature of the technology. Hence, this project can be useful and can be implemented in real time applications for recording the attendance. By integrating both RFID and microcontroller generates a project with wider boundaries and effective solutions. The system can be improved by increasing the range of reader in which the tag can be read. Improvement can be done by using this system in which the tag encrypts its ID and then sends to the RFID reader, which will eliminate the capturing of the tag IDs and hence cloning the tags. It offers a valuable detailed database records and preference to developer and investigators. The RFID based security system could plays important role in providing sensitive environments at low cost.

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