DESIGN AND CONSTRUCTION OF SMART ROAD SYSTEM

A project submitted in partial fulfillment of the requirements for the Award of degree of
Bachelor of Science in Electrical and Electronic Engineering

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Certification

This is to certify that this project and thesis entitled "**Smart road system**" is done by the following students under my direct supervision and this work has been carried out by them in the laboratories of the department of Electrical And Electronic Engineering under the faculty of Engineering of Daffodil International University in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering.

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APPROVAL

This project titled **"DESIGN AND CONSTRUCTION OF SMART ROAD SYSTEM"** submitted by **Md Mizanur Rahman ID: 142-33-1913** To the Department of Electrical & Electronic Engineering, Daffodil International University, Has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. In Electrical & Electronic Engineering and approved as to its style and contents.

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Dedicated To

My Parents & Beloved Supervisor

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ACKNOWLEDGEMENT

First of all, we give thanks to Allah or God. Then we would like to take this opportunity to express my appreciation and gratitude to my project and thesis supervisor **Professor Dr. M. Shamsul Alam, Dean, Department of EEE** for being dedicated in supporting, motivating and guiding us through this project. This project can't be done without his useful advice and helps. Also thank you very much for giving us opportunity to choose this project.

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To my beloved family, I want to give them our deepest love and gratitude for being very supportive and also for their inspiration and encouragement during our studies in this University.

ABSTRACT

The objective of the project is to build a system that can measure the speed of vehicles in the road. The aim of the project was the fabrication of an automated system that could measure the speed of vehicles in parking slot, regular roads etc. A summary of what is to follow can be stated to constitute of the introduction, description of mechanical and electronic parts the project is mainly composed of, description of the ways the two have been interfaced and also an extent on how automation was achieved by programming and software coding. The advantage of this project is to develop easy measuring of speed in road. Its accuracy is better than other system. Our system is modern digital technology-made by microcontroller. The system can also consume time. The measuring accuracy of our project is very well. It also maintain auto street lighting system according to vehicles speed. Our suggestion is as this is not a manufactured product, only for test proto type, it accuracy can be increase in further by research & development.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Safety is an aspect of life that is paramount and it can only be in place when security is intact. Controlling devices with the use of switches are the common case. This system uses an infrared sensor as a wireless communication to connect control devices. This system is to manage the speed limit of a vehicle on highway using the microcontroller. This system will be composed of a main PIC 16F887, power supply, speed sensing circuit, camera system and database system. The sensor detects the speed information of vehicle and sends signal to the microcontroller. If the vehicle is over speed, microcontroller report these information to PC and LCD will be displayed as over speed. And PC also continue to start the camera to capture the vehicle. Then all the information of vehicle are collected in database table. Otherwise the vehicle is not over speed, normal speed‖ will be displayed on LCD.

1.2 Objective

- Crucial importance for measuring the speed of every vehicle.
- The main aim of the project to develop a system automatic speed control of vehicle and accident avoidance using eye blink sensor and ultrasonic sensor
- This device enables for detect over speed of any vehicles and to control automatic street light system.

1.3 Theory

Any obstacle is detected in running vehicle depends on distance automatically control the speed of vehicle. The driver in sleeping /drowse position the eye blink sensor detects the eye blink is not more than 30 sec eye closed vehicle stop the automatically, it is not manually. Give alarm to driver alert. The ultrasonic sensor system continuously sends signals and monitors any car or other obstacles are in front of car. The distance up to which ultrasonic sensor can work may be up to 4

meter. When any obstacle or vehicle detected by ultrasonic sensor system it will send signal to the embedded board. Also give alarm to alert to the driver. Many accidents at High-ways are taking place due to the close running of vehicles, all of sudden, if the in front vehicle driver reduces the speed or applied breaks, then it is quite difficult to the following vehicle driver to control his vehicle, resulting accident. To avoid this kind of accident, the warning system, which contains alarm and display system can arrange at rear side of each and every vehicle.

1.4 Methodology

- Collection of information from books and internet.
- Collection of component from local market.

1.5 Overview

This is an effective project to automatically control the speed of the car. When the speed of the vehicle is too high on the road, it will only give an alert in addition to monitoring the speed, which is a warning signal. As a result, many unsafe accidents can be avoided. It also controls the street lamps based on the speed of the car.

1.6 Project outline

Chapter 2 describes all the hardware devices and power supply to the project.

Chapter 3 describes the block diagram, working procedure, connection diagram and explanation.

Chapter 4 describes about software analysis & programming.

Chapter 5 reviews the results found through the project and provides a discussion on the findings.

Chapter 6 specified the limitations of the project, provides the future works that may be approached and conclusion.

1.7 Major Components used in this entire project

- PIC16F72 Microcontroller
- Crystal 16mhz
- LCD Display
- Capacitors
- Resistor
- Diode
- LED
- Ac To Dc Power Supply
- LDR
- Sample PCB
- 7805 IC
- Soldering Lead and Etc.

1.8 Summary

Firstly we discuss about project, .Then we discuss about objective and methodology of this project. Lastly we discuss about project outline and major components in this chapter.

CHAPTER 2

MAJOR COMPONENTS DESCRIPTION

2.1 Microcontroller

Micro controller is an IC that can work like a computer processor. But it can run only a single program at once. Microcontrollers are called single-chip microcomputers. The single chip is similar to a common IC chip to see the microprocessor. Many may be surprised. A computer's motherboard is open, lots of IC chips, and I'm saying a chip is a computer. Now let's prove it. Various types of microcontrollers are available in the market to buy. One of the most popular microcontroller in the PIC series is PIC16F877. Within a microcontroller chip, almost all parts of the full computer system are available, such as: Processor, RAM, ROM, I / O Port, ADC, Timer etc., so that the device can act as an alternative to a computer. The word micro here means that the computer inside the microcontroller chip is small and the controller means the controller, which means that the device can control any electrical object, process or event.

Figure 2. 1: Microcontroller

2.1.1 PIC16F877A Pin Configuration

Pin Number	Pin Name	Description
1	MCLR/VPP	MCLR is used during programming, mostly connected to programmer like Pick it
2	RA0/AN0	Analog pin 0 or 0th pin of PORTA
3	RA1/AN1	Analog pin 1 or 1st pin of PORTA
4	RA2/AN2/Vref -	Analog pin 2 or 2nd pin of PORTA
5	RA3/AN3/Vref+	Analog pin 3 or 3rd pin of PORTA
6	RA4/T0CKI/C1out	4th pin of PORTA
7	RA5/AN4/SS/C2out	Analog pin 4 or 5th pin of PORTA
8	RE0/RD/AN5	Analog pin 5 or 0th pin of PORTE
9	RE1/WR/AN6	Analog pin 6 or 1st pin of PORTE
10	RE2/CS/AN7	7th pin of PORTE
11	VDD	Ground pin of MCU
12	VSS	Positive pin of MCU (+5V)
13	OSC1/CLKI	External Oscillator/clock input pin
14	OSC2/CLKO	External Oscillator/clock output pin
15	RC0/T1OSO/T1CKI	0th pin of PORT C
16	RC1/T1OSI/CCP2	1st pin of POCTC or Timer/PWM pin
17	RC2/CCP1	2nd pin of POCTC or Timer/PWM pin
18	RC3/SCK/SCL	3rd pin of POCTC
19	RD0/PSP0	0th pin of POCTD
20	RD1/PSPI	1st pin of POCTD
21	RD2/PSP2	2nd pin of POCTD
22	RD3/PSP3	3rd pin of POCTD
23	RC4/SDI/SDA	4th pin of POCTC or Serial Data in pin
24	RC5/SDO	5th pin of POCTC or Serial Data Out pin
25	RC6/TX/CK	6th pin of POCTC or Transmitter pin of Microcontroller
26	RC7/Rx/DT	7th pin of POCTC or Receiver pin of Microcontroller

27	RD4/PSP4	4th pin of POCTD
28	RD5/PSP5	5th pin of POCTD
29	RD6/PSP6	6th pin of POCTD
30	RD7/PSP7	7th pin of POCTD
31	VSS	Positive pin of MCU (+5V)
32	VDD	Ground pin of MCU
33	RB0/INT	0th pin of POCTB or External Interrupt pin
34	RB1	1st pin of POCTB
35	RB2	2nd pin of POCTB
36	RB3/PGM	3rd pin of POCTB or connected to programmer
37	RB4	4th pin of POCTB
38	RB5	5th pin of POCTB
39	RB6/PGC	6th pin of POCTB or connected to programmer
40	RB7/PGD	7th pin of POCTB or connected to programmer

Table 2.1**: PIC16F877A Pin Configuration**

2.1.2 PIC16F877A Features

PIC16F877A –Simplified Features	
CPU	8-bit PIC
Number of Pins	40
Operating Voltage (V)	2 to 5.5 V
Number of I/O pins	33
ADC Module	8 ch, 10-bit
Timer Module	8-bit(2), 16-bit(1)
Comparators	2
DAC Module	Nil
Communication Peripherals	UART(1), SPI(1), I2C(1), MSSP(SPI/I2C)
External Oscillator	Up to 20 MHz

Internal Oscillator	Nil
Program Memory Type	Flash
Program Memory (KB)	14 KB
CPU Speed (MIPS)	5 MIPS
RAM Bytes	368
Data EEPROM	256 bytes

Table 2.2: PIC16F877A Features

2.1.3 Uses of microcontrollers

Today, microcontrollers use almost all electronic devices. Microcontrollers are used in electronic systems such as digital thermometers, calculating instruments such as calculators, display systems such as scroll message display, battery ad, etc. Microcontroller has a great deal of use in modern automobile technology. Today, almost all the car manufacturing companies use an additional microcontroller to control the minimum of one microcontroller and other vehicle systems as engine regulator. Desktop computer peripherals such as keyboards, modems, printers and other peripherals have the use of microcontrollers. Microcontroller has added modern features in bulk testing and mazing equipment, such as measuring measurement lessons, user routine preservation, and waveform and measuring results in digital displays. Modern TV receivers and remote controllers also use microcontrollers, and a standard device for microcontroller to control the lift used in multi-storied buildings. The examples mentioned are just a few examples of microcontroller applications. With the development of electronic technology, the use of microcontrollers is increasing so much that no electronic device can be found without the use of microcontrollers in the future, i.e. there will be only one microcontroller where there will be an electrical control system.

2.1.4 Benefits of using microcontrollers

Choosing the right microcontroller for a specific system design is very important because the performance of the system is dependent on the microcontroller. If the correct microcontroller is

not selected the system performance may be bad. Again each system is developed aimed at a business objective. So, using the more expensive microcontroller, because of the ignorance, the cost of system design will increase, so business success will be hampered, and using cheaper chips will be deprived of many hardware benefits. In view of this, it is important to select the most programmable microcontroller chip with only the necessary hardware facilities at the lowest cost, considering the needs and prices of the system, which is capable of performing the system's performance.

2.1.5 Different types of microcontrollers

According to the processing ward size

1. 4-bit microcontroller

2. 8-bit microcontroller

3. 16-bit microcontroller

4. 32-bit microcontroller

Instruction set:

1. RISC microcontroller

2. CISC microcontroller

According to the memory connection method

1. Internal memory microcontroller

2. External memory microcontroller

According to the microcontroller's memory architecture

1. Harvard architecture microcontroller

2. Von-Newman architecture microcontroller

Different part of microcontrollers are:

CPU

Meaning of CPU - Central Processing Unit or Central Improving Part. It consists of ALU, Accumulator, Control Unit, Flag, Stack Pointer and some General Purpose Register. All the mathematical and logical operations of a microcontroller are done in the ALU under the CPU. This is why the CPU is called the microcontroller's brain. The processor performs the initial four tasks

Memory

Semiconductor memory is used inside the microcontroller. Memory parts contain RAM, ROM and some common registers. Execution of the program is done directly with the involvement of RAM and CPU. RAM is the volatile memory, i.e. the data on the microcontroller when the power supply is stopped. The program at ROM is stored permanently. Microcontroller ROM can be both internal and external. If the ROM is embedded, then the amount of it is limited by adding an external ROM to its limit, but the circuit complexity increases.

Input / Output Port

In the practical circuit, the microcontroller is associated with various peripherals such as LCD display, seven segment display, and stepper motor, various sensors, etc. These are controlled by the control signal emitted from the microcontroller. The electrical signal emitted from different sensors was then accepted in the microcontroller. Acoustic and emission of these signals in microcontrollers is done through special types of ports called input output port. In fact, these ports are one or more of the registers formed inside the microcontroller, whose bits are logically connected to the external pins of the microcontroller. Ports are defined as User Definitions, which can be controlled by user programs and the same port can be set by user program as input and

output port. Ports are of two types (1) serial port and (2) parallel port. Parallel port for serial data communication and serial port for parallel data communication is used.

Timers and counters

Most microcontrollers have at least one, and in some cases there are multiple timers / counters that can calculate events, break measurements, and events. The main function of this part is the frequency measurement, clock function. It can calculate the external pulse. When calculating the external pulse it acts as a counter. It's basically 8 or 16bit registers.

Interrupt Controller

During the execution of a program, interrupting the normal flow of the program, interrupting another suburban execution is called interrupt. After that subroutine execution, the processor is back in the original program execution. In the microcontroller interrupt can be either external or internal.

2.1.6 Features of microcontrollers

The structural structure of that microcontroller is what it presents with the help of a microcontroller which consists of a basic composition. Structural structures of different microcontrollers differ in the production process. But it is very difficult for students to learn structural structures of each microcontroller separately. This is why a simple and basic structural framework is thought to create a transparent apparent conception of the microcontroller's structure and functioning. One such basic structure and functional structure is presented in the following figure:

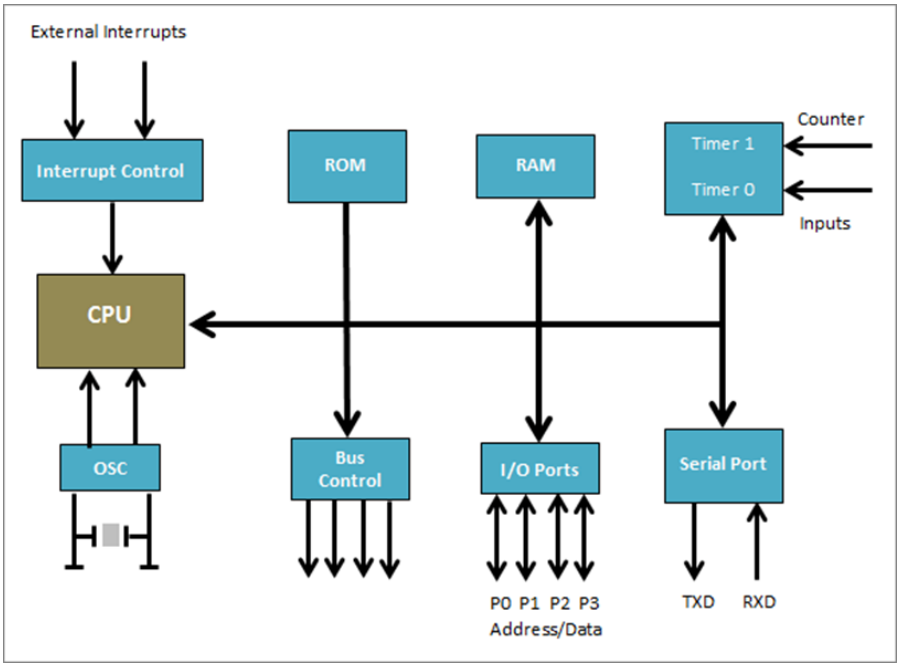

Figure 2. 2: Block diagram of microcontroller

2.1.7 Applications

- ❖ Multiple DIY projects
- ❖ Very good choice if you are learning PIC
- ❖ Projects requiring multiple I/O interfaces and communications
- ❖ Replacement for Adriano module
- ❖ Ideal for more advanced level A/D applications in automotive, industrial, appliances and consumer application.

2.2 LCD display

Liquid-crystal displays have specific advantages of having less electricity than LEDs. It is usually in order of microwatts for widescreen displays compared to some order for LEDs. Less power consumption is compatible with MOS integrated logic circuits. Its other advantages are its low cost, and good contrast. LCD's main flaws require additional requirements of light source, a limited temperature range of operation (between 0 and 60 ° C), low reliability, short work life, slow

ambient lightness in low ambient light, slow and requires a AC drive. We use 16x2 LCD display for our project

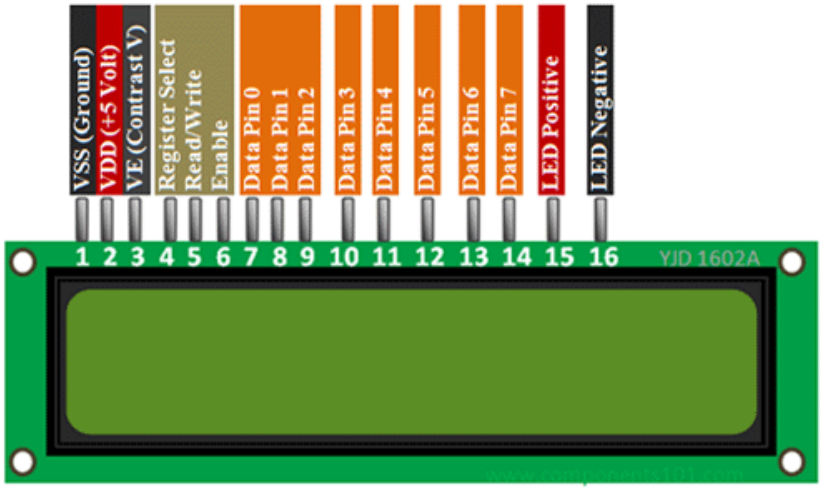

Figure 2. 3: LCD display

The 16x2 LCD used in this experiment has a total of 16 pins. As shown in the table below, eight of the pins are data lines (pins 7-14), two are for power and ground (pins 1 and 16), three are used to control the operation of LCD (pins 4-6), and one is used to adjust the LCD screen brightness (pin 3). The remaining two pins (15 and 16) power the backlight. The details of the LCD terminals are as follows:

Terminal 1	GND
Terminal 2	+5V
Terminal 3	Mid terminal of potentiometer (for brightness control)
Terminal 4	Register Select (RS)
Terminal 5	Read/Write (RW)
Terminal 6	Enable (EN)
Terminal 7	DB0
Terminal 8	DB1
Terminal 9	DB2
Terminal 10	DB3
Terminal 11	DB4
Terminal 12	DB5
Terminal 13	DB6
Terminal 14	DB7
Terminal 15	+4.2-5V
Terminal 16	GND

Table 2.3: LCD terminals

2.3 Crystal oscillator

It is a kind of electronic device or circuit that can generate frequencies of different ranges in demand. It basically transforms the energy available from the DC source into a variable output. These outputs are sinusoidal or non-sinusoidal. Quartz crystal is mainly used in radio-frequency (RF) oscillators. Quartz crystal is the most common type of piezoelectric resonator, in oscillator circuits we are using them so it became known as crystal oscillators. Crystal oscillators must be designed to provide a load capacitance. Crystal oscillator, Hartley oscillator, phase-shift oscillator, oven bridge oscillator, tend oscillator, colitis oscillator are different types of crystal oscillator.

Figure 2. 4: Crystal oscillator

2.3.1 Elements of crystal oscillator

The most common material for oscillator crystals is quartz. At the beginning of the technology, natural quartz crystals were used but now synthetic crystalline quartz grown by hydrothermal synthesis is predominant due to higher purity, lower cost and more convenient handling. One of the few remaining uses of natural crystals is for pressure transducers in deep wells. During World War II and for some time afterwards, natural quartz was considered a strategic material by the USA. Large crystals were imported from Brazil. Raw "lascar", the source material quartz for hydrothermal synthesis, are imported to USA or mined locally by Coleman Quartz. The average value of as-grown synthetic quartz in 1994 was 60 USD/kg.

2.3.2 Application of crystal oscillator

The use of crystal oscillator in military and aerospace, is to establish an efficient communication system, for the navigation purpose, electronic warfare, in the guidance systems, and so on.

2.3.3 Function of crystal oscillator for the circuit

Crystal Oscillator is a component that provides the clock signal for the microcontroller and microprocessor according to the analog write. When the MC will get the character variable value from the Bluetooth MC will read and store the digital data. Then the crystal will provide 1 0 or 0 1 for the motor rotation in clockwise and anticlockwise direction. In here, if we send analog write 150 to motor pic1, 0 for motor pin2, then the motor will rotate in clockwise direction, motor will rotate in anticlockwise direction when motor pin2 will get 0, pin1 will get 1.

2.4 Capacitor

The separator between the two conductive plates and the dielectric separates the plate, the device that is made is called a capacitor. Capacitor is a battery packed device that can charge the charge, so that in the past days this device was called electrical condenser. The capacitor is expressed by adding two terminals to the two sides of two parallel plates. If the capacitor is polar, then the polarity of the plate is expressed using the (+) or (-) sign on the plate or a plate is curved. The curved plate displays the negative terminal. If the capacitor is a variable value, it is represented by an arrow with an arrow on the plate. Presently the capacitance SI single Farad, it is published by the English F character. But Farad is a single unit of microfarad μF and Pico farad pF ranges in a practical field as a large unit.

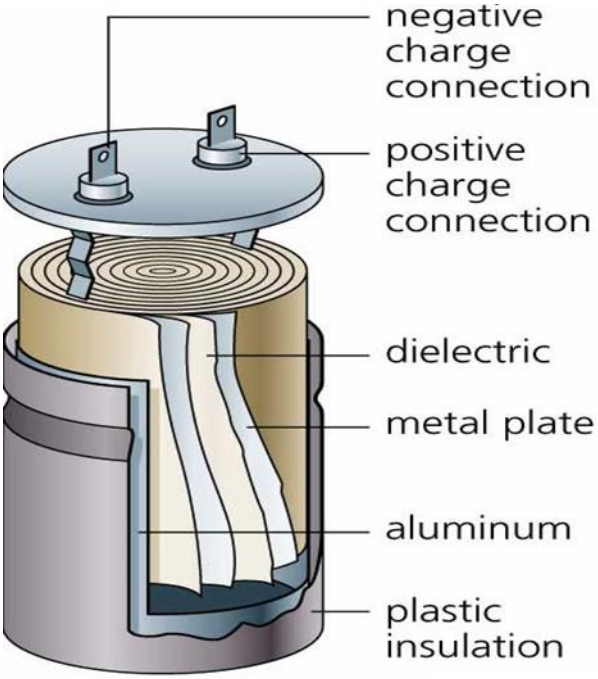

Figure 2. 5: Capacitor construction

2.4.1 The capacitance of a capacitor

Capacitor is the device or circuit element and capacitance is the capacitance of the device's properties or quality, the capacitor's capability to hold charge of the die-electric material. Capacitance is less than the capacitor's capacity to charge more than its capacitance and charging capacity lower.

2.4.2 Standard units of capacitance

Microfarad (μF) 1μF = 1/1,000,000 = 0.000001 = 10^{-6} F

Nano farad (NF) 1nF = 1/1,000,000,000 = 0.000000001 = 10^{-9} F

Pico farad (pF) 1pF = 1/1,000,000,000,000 = 0.000000000001 = 10^{-12} F

2.4.3 Capacitor applications

- ❖ At the power station used for power factor correction.
- ❖ Prevention of transient phenomena in any electronic circuit.
- ❖ Plastic DC is used for filtering down ripple.
- ❖ In High-pass, low-pass filters, etc. Circuits.
- ❖ Clamper Circuit.
- ❖ RC coupling circuit.

2.5 Resistor

The most widely used device resistors in electronic circuits. No other device like the resistor is so much used. Resistors is an electrical device or circuit element, which can prevent the flow of electricity according to its capability. Resistors properties are called resistance. For example, if we want to stop the car on the street, we set up a speed-breaker that prevents the movement of the car and the speed of the vehicle decreases if you use the speed breaker. Then the speed barrier is to prevent the movement of the device and the vehicle. Similar to the resistor, the registers are the characteristics or characteristics of the device and the resistance of the flow of electricity.

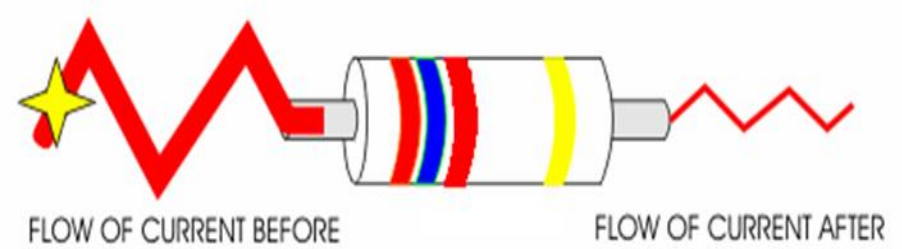

Figure 2. 6: Resistor working principle

2.5.1 Resistor color code

Figure 2.7: Color code of resistor

2.5.2 Used resistor in circuit

The resistor is a passive two terminal component that is used to limit the current and drop the voltage. We have used a several resistor in the circuit that limits the current and drop the voltage across the LED and MC respectively.

2.6 Diode

Diode is a special type of electronic semiconductor device with two terminals, which has a PN function created in single crystals and which can lead to one-way current flux. In a word, a PN function is called semiconductor diode or crystal diode. In diode, front has a vertical bar or bar and there are two straight lines on either side. The arrow sign indicates the direction of the current flow in forward air, that is, that direction is the direction on which the flow of the holes flows in forward air. The two side lines indicate two terminals, one of which is anode and a cathode. Terminal associated with the P-type material is called terminal with anode and n-type material called

cathode, which is indicated in the figure. If the arrow marked terminal is more positive than the specified terminal, then the diode has been forwarded to the air.

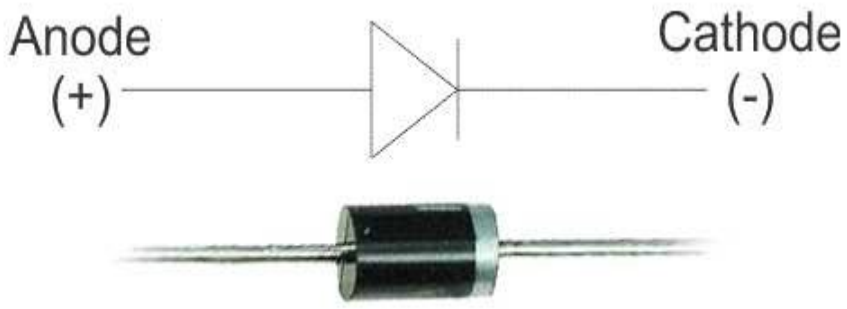

Figure 2. 8: Diode

2.6.1 Types of diode

Depending on the structure and operation, different types of diodes are used in electronic circuits that are seen as follows:

- General / Rectifier Diode
- Scotty Diode
- Tunnel diodes
- Vector Diode
- Light emitting diode LED
- Photo Diode
- Solar Cell
- Laser diode

2.6.2 Uses of diodes

There is widespread use of diodes in modern electronic circuits, but the following uses are very popular.

- To convert AC current to a DC current as a rectifier diode, which is widely used in power electronics.
- Signal diodes as well as various communication circuits, such as small signal modulation and demodulation circuits.
- The voltage stabilization circuits are used in gene diodes.
- Voltage controlled tuning circuit variant diode is used in radio and TV receivers.
- Different types of logic circuits.

2.7 Transistor (tip122)

Transistor is the name of the device that has been able to develop and develop electronic technology rapidly after its innovation. It is a breakthrough in science and technology. Due to the use of transistors, it has been possible to design small, low power wastage and low thermal circuitry for electronic devices. Transistors are the primary and basic components of modern electronic devices and parts. It is composed of semiconductor material usually with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals controls the current through another pair of terminals. Because the controlled (output) power can be higher than the controlling (input) power, a transistor can amplify a signal. Today, some transistors are packaged individually, but many more are found embedded in integrated circuits. Here the word 'trans' represents the signaling transmitters of the transistor and the word 'istor' includes the transistor as a device in the registry category.

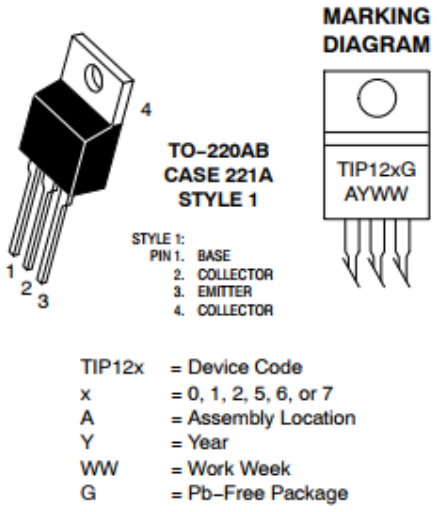

Figure 2. 9: Transistor (tip122)

2.8 Voltage regulator (7085)

A voltage regulator is used to regulate voltage level. When a steady, reliable voltage is needed, then voltage regulator is the preferred device. It generates a fixed output voltage that remains constant for any changes in an input voltage or load conditions. It acts as a buffer for protecting components from damages. A voltage regulator is a device with a simple feed- forward design and it uses negative feedback control loops. There are mainly two types of voltage regulators: Linear voltage regulators and switching voltage regulators; these are used in wider applications. Linear voltage regulator is the easiest type of voltage regulators. It is available in two types, which are compact and used in low power, low voltage systems. Let us discuss about different types of voltage regulators.

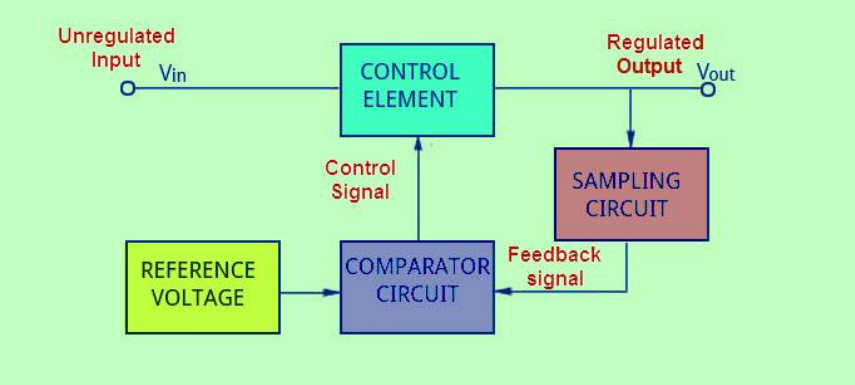

Figure 2. 10: Voltage regulator working block diagram

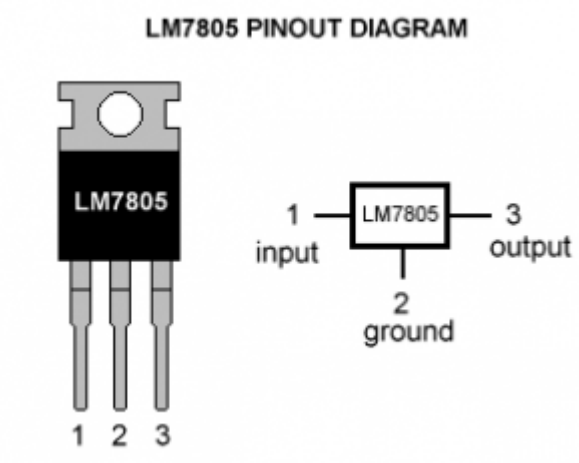

Figure 2.11: LM 7805

2.9 IR sensor

An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting or detecting radiation. Infrared sensors are also capable of measuring the heat being emitting by an object and detecting motion.

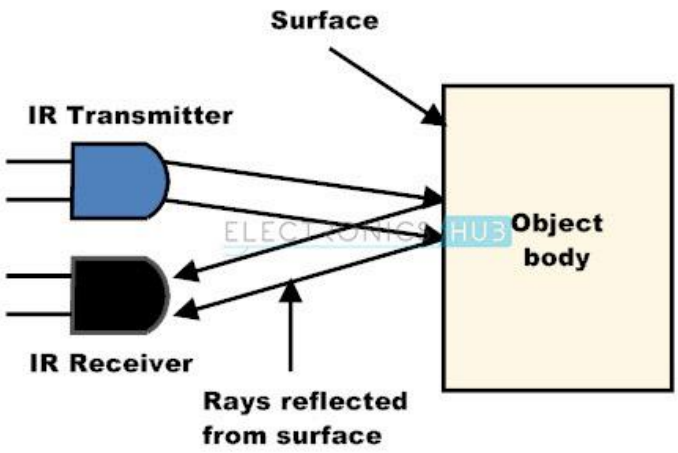

Figure 2. 12: IR sensor

2.9.1 Uses of IR sensors

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor.

2.10 Light Emitting diode (LED)

The full meaning of LED is the light emitting diode. It is a special type of semiconductor diode that can be visible and infrared in the forward bays mode, which can release both invisible light waves.

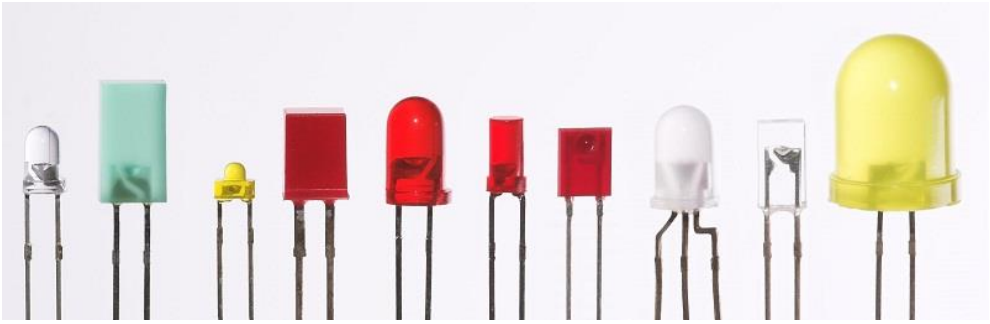

Figure 2. 13: LED

2.10.1 Uses of LED

- Different audio systems
- Electronic meter
- Different digital meters
- Audio Analyzer
- As the monitor bake lite
- Different electronic systems as indicators.
- Seven segment displays use LEDs in each segment.
- Infrared LEDs are used in remote control transmitters and CCTV cameras.
- Various electronic ads alpha numeric display to make.

2.10.2 Advantages

- Power costs are low
- Small and light in size
- Not thermostat
- Cheap prices
- Long live light source

2.10.3 Disadvantage

- It cannot be used as a Rectifier due to its forward resistance.

2.11 Light Dependent Resistor (LDR)

An LDR is a component that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light sensing circuits

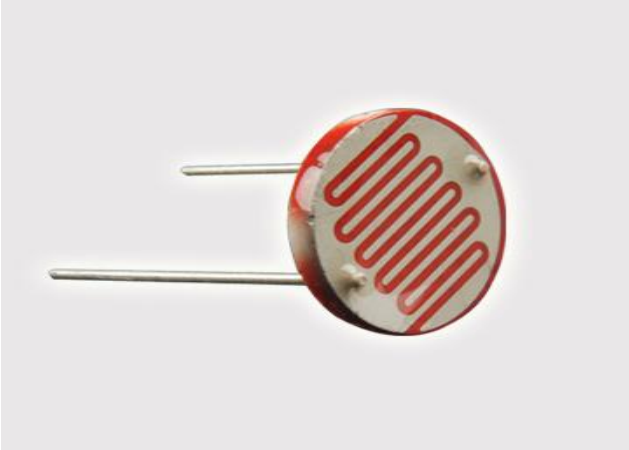

Figure 2. 14: LDR

2.12 Cost sheet

No	Component Name	Purchase Price (TK)
1	PIC16F72 Microcontroller	200
2	Inductor 220uH	5
3	AC to DC power supply	250
4	Crystal 16MHz	10
5	LCD display	160
6	Capacitors	50
7	Some resistor	10
8	Diode	10
9	Connector	15
10	LED	50
11	Some wires	20
12	Soldering lead and etc	100
13	Sample PCB and model board	1000
14	IR sensor	10
15	7805 IC	10
16	LDR	5
	Total Cost	**=1905**

Table 2.4: Cost sheet

CHAPTER 3

SYSTEM DESIGN & DEVELOPMENT

3.1 Working function of my project

In our project main power supply is ac. Then we convert it dc with bridge rectifier hen the power supply goes to voltage regulator and we get 5 volt regulated voltage. It supplied into microcontroller, display and IR sensor unit. When we on the switch then the first IR sensor start to count time LDR control the switch of LED. When first if sense the absence of vehicle then the light start to emit light fully.at last second IR sense the absence of vehicle then we can calculate the speed of vehicle. If it is less than 80 then fine else it is more than 80 then the buzzer start to beep.

3.2 Block diagram of hardware implementation

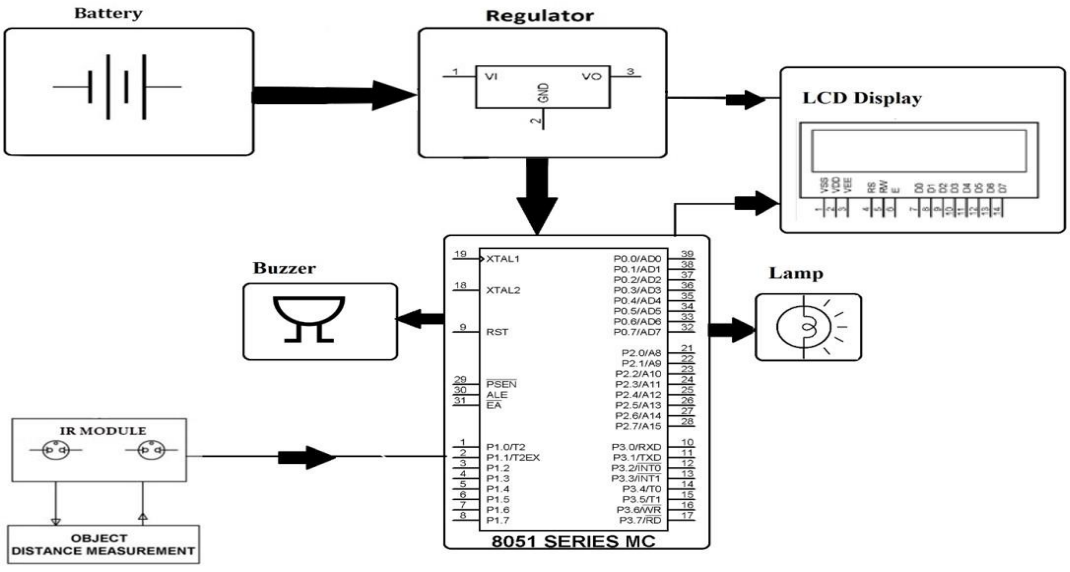

Figure 3. 1: Block diagram of hardware implementation

3.3 Working procedure of block diagram

High speed checker has been implemented here, assume that the maximum speed of the highway is 50 km / h according to the traffic rules. The connector of IR LED1 and IRDD1 is connected to the pin 18 of RC7. Generally, IR LEDs have been continuously falling on light ER diodes. Whenever the light that hits IRDD is hampered by any vehicle, the IR Data goes high and so the pin of RC7 is 18 high. As a result, the duration of the output is calculated by calculating the speed for the given distance. Resistor R4 and transistor Q1 decide for the time of piezoelectric buzz.

3.4 Connection and explanation of whole system

In this diagram we show that the connection of whole system.at first we supplied power then regulate it. After that it goes to microcontroller control unit and all the project. Here we show regulator, microcontroller unit, IR sensor unit, and display unit. How to connect with this circuit and its functions are discussed below and with circuit diagram of battery charger. Here the circuit connecting and equipment is identified. We are trying to present the key project by this circuit diagram.

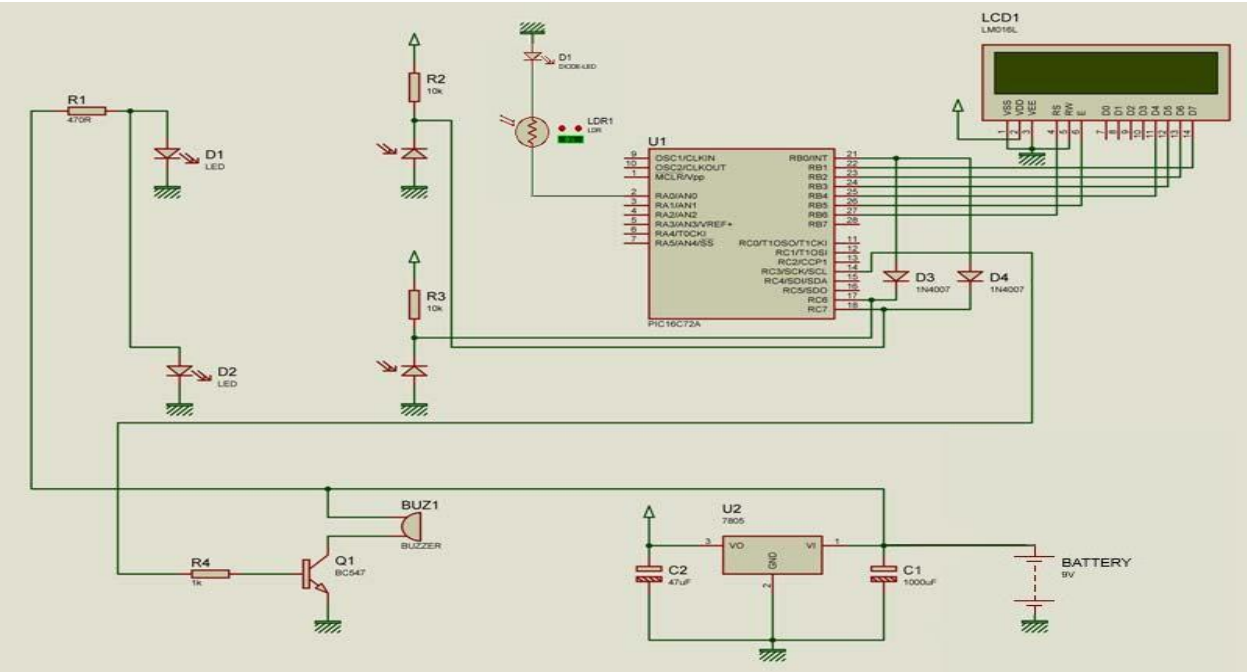

Figure 3. 2: Connection diagram

3.5 Working principle of connection diagram

The voltage of IC 7805 is given in the input. This voltage is given in IC 7805 through a diode. Then a capacitor connecting to the AUP is given to the ground. And 5 volts are available in output. This 5 volt circuit is sent to all voltages sources. Micro-trailer PIC 16F72 RST point is connected to 5 volts in a register series of 10 kilo ohm. Connecting the LDR and LED light to parallel via photodiode and connecting a capacitor with ADC 0 points is connected. A link between RC4 and RC 5 points is provided by 2 registrars. Ground VSS points. With OSC1 and OSC2, connect 16 KHZ crystals to Parallel. Infrared LED connection is given in series with the voltage at the end of the OPM. And with a negative side, a variant register is connected to 1K ground. Grounding with the output of operation amplifier from 1 k registers with a red lamp in the series. From the output amplifier's output, connecting to the 1K register series connects to RC 0 points. And in the positive end of the operation amplifier, the infrared LED is connected to the series with the voltage

3.6 Flow chart

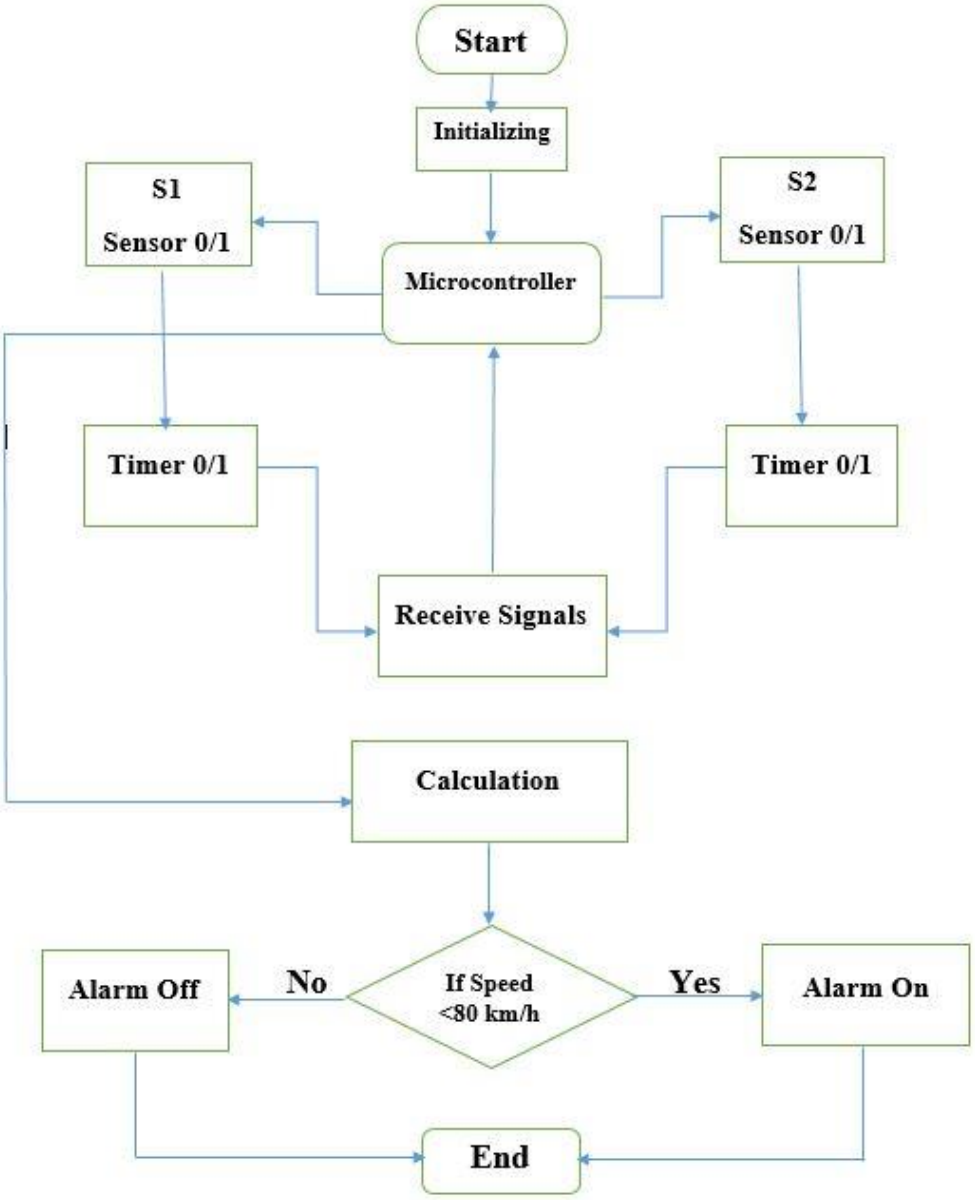

Figure 3. 3: Flow chart

3.7 Summary

In this chapter we discuss about the hole working process of this project. At first we discuss about block diagram. Then circuit diagram and its explanation. End of this chapter we discuss about working principle and flowchart.

CHAPTER 4

SOFTWARE ANALYSIS & PROGRAMMING

4.1 Introduction

In this chapter we explained about the software and the language of the program code .We used and the program code dumping tools. The chapter also documents the development of the program for the application.

4.2 Description of my software

To control a microcontroller and count rpm we used basic c language. The microcontroller environment makes it easy to write code and upload it to the I/O board. It runs on pic c compiler. After compiled it in a pic c compiler then we uploaded it in our used microcontroller with the help of burner. The screenshot of Pic c compiler is given bellow

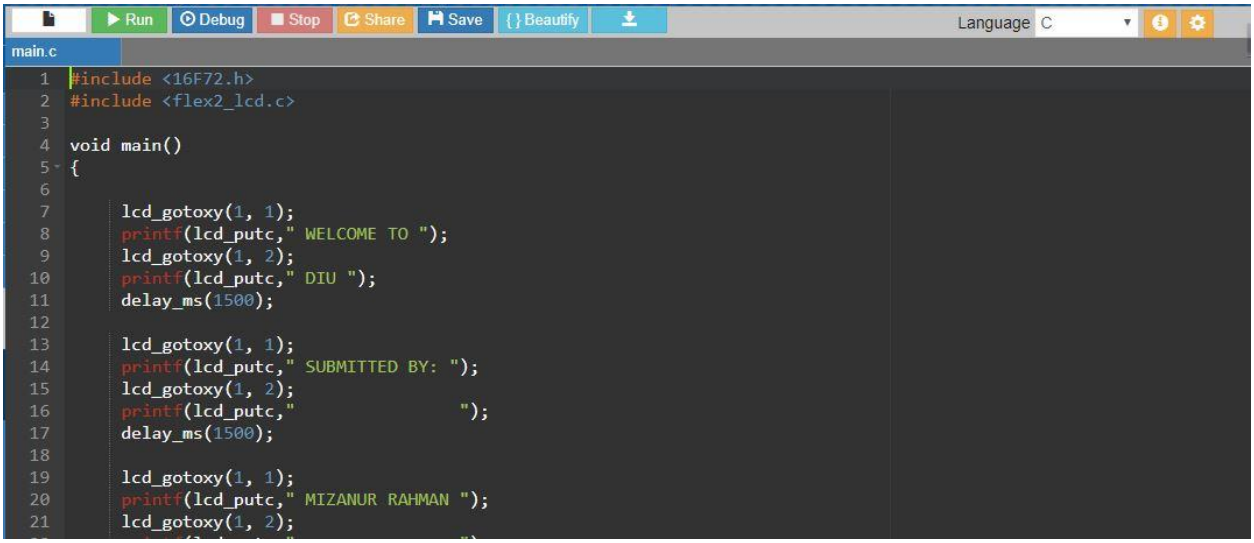

Figure 4.1: Software platform

4.3 The Compiled window of my code is shown below

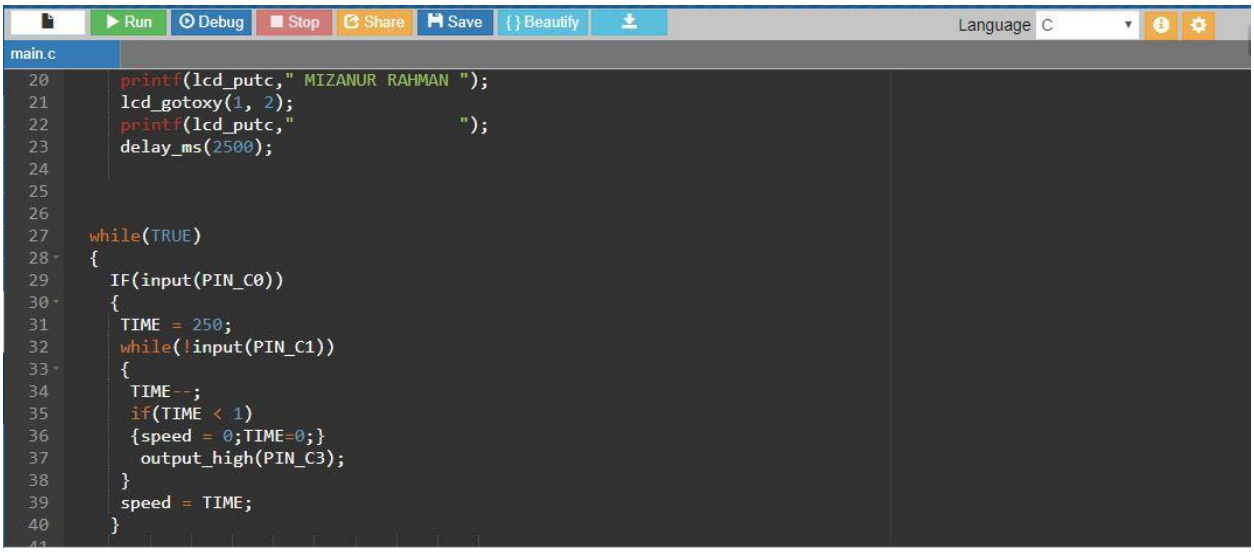

Figure 4.2: Compiling window

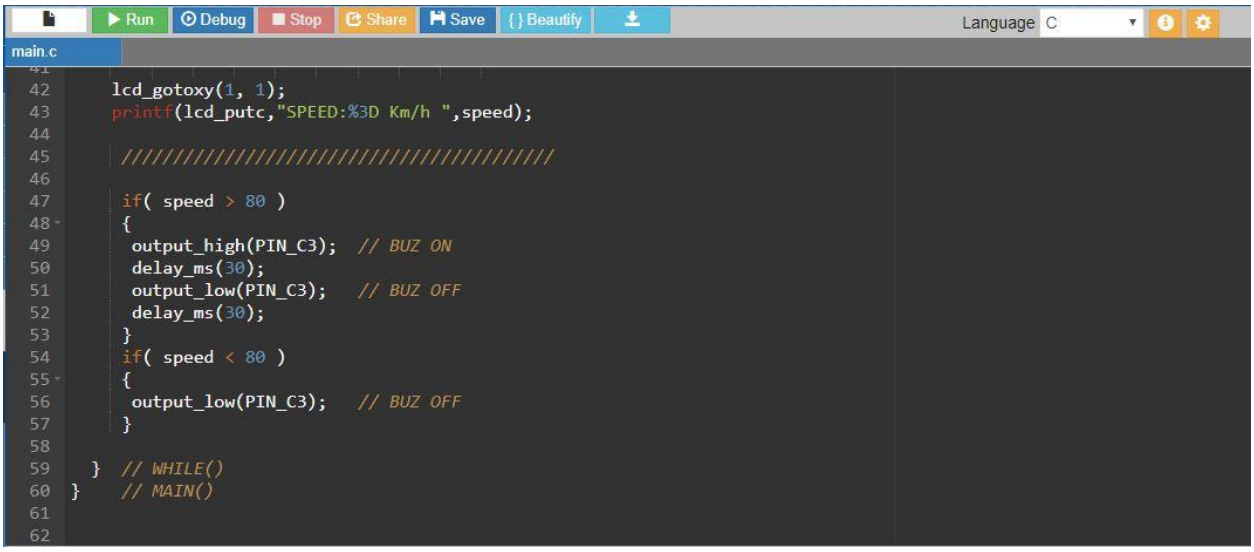

Figure 4.2.1: Compiling window

4.4 Program loader

We used and the program code dumping tools. The chapter also documents the development of the program for the application. The microcontroller environment makes it easy to write code and upload it to the I/O board. It runs on pic c compiler. After compiled it in a pic c compiler then we uploaded it in our used microcontroller with the help of burner.

Figure 4.3: Program loader top win 2005+

4.5 Conclusion

This project developed a contactless smart road system. This project is totally contactless and controlled by microcontroller. Its help to auto street lighting system and vehicle speed measurement system according to IR sensor.

CHAPTER 5

RESULT AND DISCUSSIONS

5.1 Introduction

Results are output of a project. The results represent a project success. We find out successful results of this project by various exams. In this chapter we get the results that we have received from beginning to end of our project, shown step by step photo.

5.2 Project after setup

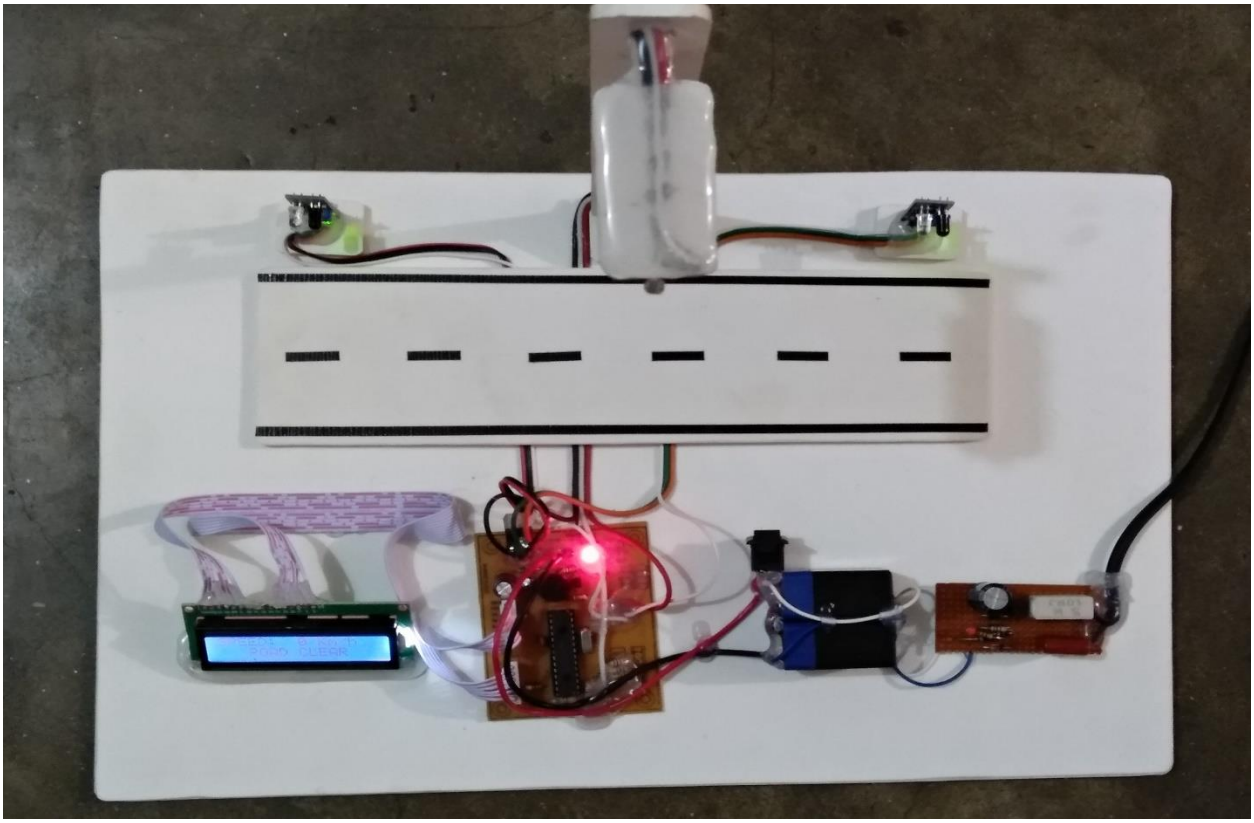

Figure 5.1: Before start the system

- The car is running according to the rules. The speed of which is 35 kilometers per hour.

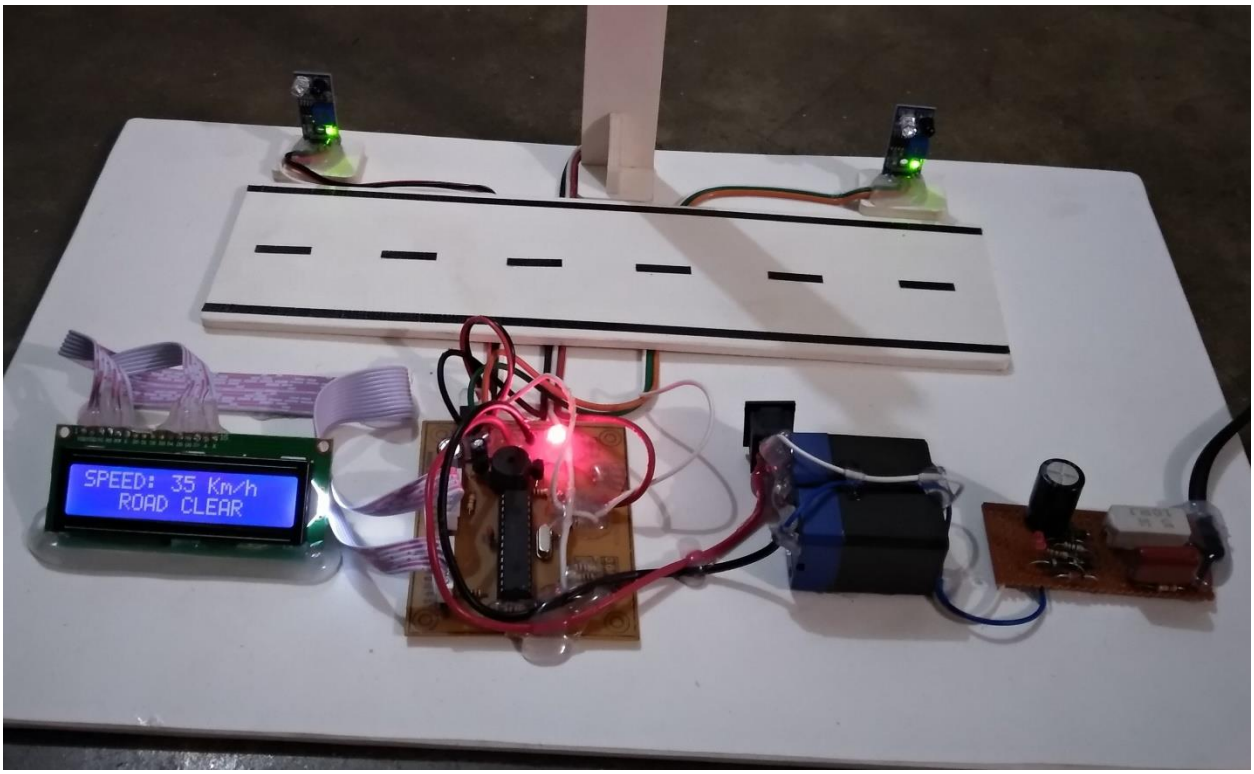

Figure 5.2: After start the system

- The highest speed limit is 80 kilometers per hour. The driver does not agree with the rules, which prevents the car's speed as per the gate rules. The speed of the car was 157 kilometers per hour.

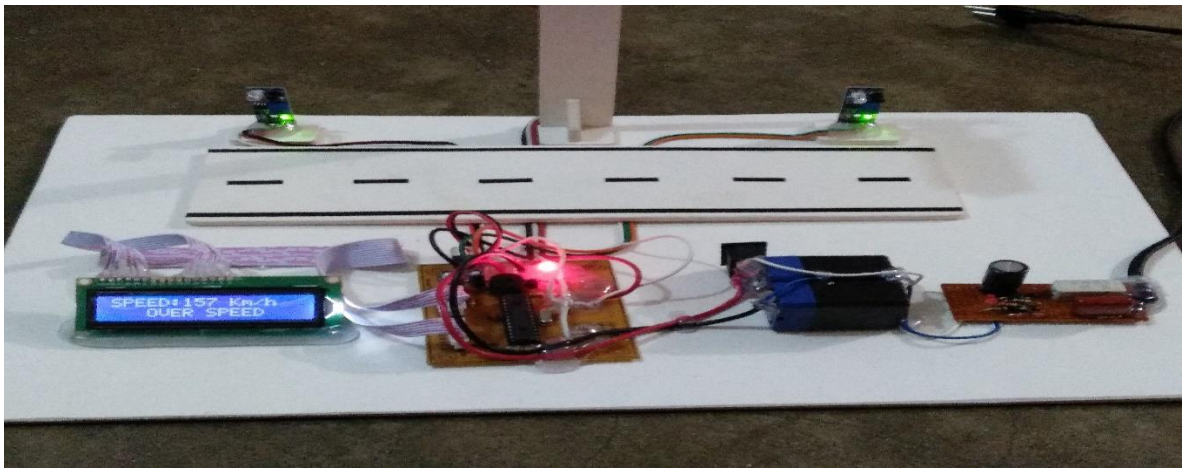

Figure 5.3: After start the system

- At night when there will not be movement, there will be little light on the street. Which we call the power saving method. This will prevent excess power loss. Which we can say is a special way of smart traffic signals.

Figure 5.4: After start the system

- As well as entering the controlled streets, light will be lit with adequate lighting and the signal is signed at the time of entry. As long as the vehicle is moving, it will light up.

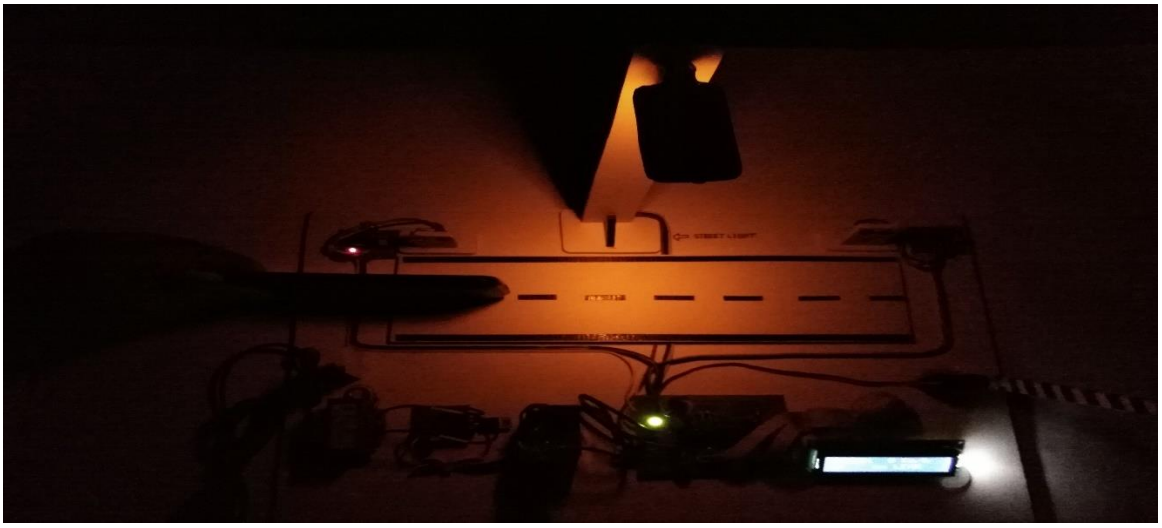

Figure 5.5: After start the system

5.3 Result

My project properly done. It is working accurately.

5.4 Discussion

The aim of this study has undoubtedly been achieved. At the end of the design and construction of the microcontroller vehicle safety signs display and dash board control it was tested and a satisfactory performance was obtained.

5.5 Summary

Firstly we discuss about Control the system, use then show the project setup, and after we showed the project when it’s working and lastly we discuss about discussion.

CHAPTER 6

CONCLUSIONS

6.1 Conclusions

The aim of this study has undoubtedly been achieved. At the end of the design and construction of the microcontroller vehicle safety signs display and dash board control it was tested and a satisfactory performance was obtained. The system is proposed to be placed at the back or front of the vehicle so that the drivers will not need to border using the manual method of changing safety sign on their vehicle rather a rewriteable program is used with various indications incorporated and could be controlled or changed on the vehicle dashboard by the depress of a button.

6.2 Applications

- More saving of energy used in the Street lights.
- Safe road lighting for smooth vehicular movement.
- Intelligent intensity control.
- To reduce road accidents.
- To help traffic police, control auto traffic system.
- This idea can be implemented on both small roads and busy highways.

6.3 Limitations of the works

- In our project, we use microcontroller, which is easy to calibrate. But, there is not so many output ports in this controller. If we use any other board like Adriano Mega, we can add many other features.
- In our project, we use infrared light as a sensor that's why we don't get better result. If we use lager light instead of infrared light, then we will get better result.

6.4 Future scopes

- There are a lot of scopes to develop in this project like we can use laser light instead of speed detection system.
- The project can further be improved by means of packaging and the use of miniaturized electronics components.
- We can use solar system for power supply.
- Further research should be done to enhance the design of the overall system.

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APPENDIX

```
#include <16F72.h>

#include <flex2_lcd.c>


Void main ()

{


    lcd_gotoxy (1, 1);

    Printf (lcd_putc," WELCOME TO ");

    lcd_gotoxy (1, 2);

    Printf (lcd_putc," DIU ");

    delay_ms (1500);


    lcd_gotoxy (1, 1);

    Printf (lcd_putc," SUBMITTED BY: ");

    lcd_gotoxy (1, 2);

    Printf (lcd_putc,"                ");

    delay_ms (1500);


    lcd_gotoxy (1, 1);

    Printf (lcd_putc," MIZANUR RAHMAN ");

    lcd_gotoxy (1, 2);
```

```
  Printf (lcd_putc,"                ");
  delay_ms (2500);



While (TRUE)
{
 IF (input (PIN_C0))
 {
  TIME = 250;
  While (input (PIN_C1))
  {
   TIME--;
   If (TIME < 1)
   {Speed = 0; TIME =0 ;}
    Output high (PIN_C3);
  }
  Speed = TIME;
 }

 lcd_gotoxy (1, 1);
 Printf (lcd_putc, “SPEED: %3D Km/h ", speed);
```

```
    ////////////////////////////////////////

    If (speed > 80)
    {
     Output high (PIN_C3); // BUZ ON
     delay_ms (5000);
     Output low (PIN_C3);   // BUZ OFF
     delay_ms (30);
    }
    If (speed < 80)
    {
     Output low (PIN_C3);   // BUZ OFF
    }

  } // WHILE ()
}    // MAIN ()
```