POLLUTION CONTROL AND ACCIDENT AVOIDANCE SYSTEM FOR A CAR

A PROJECT REPORT

Submitted by

DEEPIKA R	**Reg. No.: 1110107018**
DEIVA KALYANI A	**Reg. No.: 1110107019**
KRISHNAVENI M	**Reg. No.: 1110107048**
NIROSH ASWIN R	**Reg. No.: 1110107304**

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COIMBATORE-641049

(An Autonomous Institution Affiliated to Anna University, Chennai)

BONAFIDE CERTIFICATE

Certified that this project report **"POLLUTION CONTROL AND ACCIDENT AVOIDANCE SYSTEM FOR A CAR"** is the bonafide work of **DEEPIKA R, DEIVA KALYANI A, KRISHNAVENI M, NIROSH ASWIN R** who carried out the project work under my supervision.

SIGNATURE

Dr. G. Amirtha Gowri
Associate Professor
Department of ECE
Kumaraguru College of Technology,
Coimbatore 641049

SIGNATURE

Dr. Rajeswari Mariappan
Head Of The Department
Department of ECE
Kumaraguru College of Technology,
Coimbatore 641049

The candidates with Register numbers 1110107018, 1110107019, 1110107048 and 1110107304 are examined by us in the project viva-voce examination held on ……

Internal Examiner

External Examiner

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CONTENTS

ABSTRACT

In the present day scenario, accidents occur frequently due to over speeding and unconsciousness of the driver. In 2014, a whole of 5, 97,086 road accidents were reported in India due to the lack of speed control and drowsiness of the driver. During peak hours, the rate of accidents in areas near schools, hospitals and residential areas is more than other areas. Drowsiness of the driver, is another reason for the increased accident rate, during long night travels. In addition to this, pollution is one of the major threats to our society. The main objective of this project is to develop a module to indicate the type of zone and to control the speed of the vehicle as well as alert the driver on weariness. Currently there is no working system to alert the driver on drowsiness and to control the speed of the vehicle on entering a particular zone. In addition to this, to check the level of Carbon monoxide one has to access the smoke inspection centre. This project is designed in order to overcome these drawbacks. Specified zones like schools, residential areas, etc. are designed to have a RF based transmitter on the entry side and an IR based transmitter on the exit side to transmit the zonal information. An IR receiver and RF receiver in the vehicle detects the specified zone and automatically controls the vehicle's speed. The type of zone will be displayed in a 16x2 LCD. Each and every speed limiting zone is provided with a RF transmitter at the entering point of the zone and the vehicle consists of a RF receiver to track and automatically reduce its speed. Once it crosses the particular area, it automatically regains its normal speed with the help of IR transmitter-receiver pair at the exit side. This project also provides a system for Eye Blink Monitoring that will alert the driver in drowsiness. It is useful in warning the drivers when they fall asleep. The eye is illuminated by an IR LED and the normal eye blink rate will not have any effect on the output of the system. If the driver falls asleep, the IR sensor receives abnormal blinking rate which turns on a buzzer and stops the vehicle. Furthermore, the project also has a unit which senses and displays the level of Carbon monoxide that is emitted by the vehicle thus aiding pollution monitoring. This project uses Arduino UNO with the Microcontroller ATMEGA 328P, IR transmitter, IR receiver, RF transmitter (TLP434A), RF receiver (RLP434A), Carbon monoxide sensor (MQ7), 16x2 LCD display, motor driver (L293D), gear motors.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

RF	Radio Frequency
IR	Infra-Red
LCD	Liquid Crystal Display
USB	Universal Serial Bus
PWM	Pulse Width Modulation
RISC	Reduced Instruction Set Computer
ISP	In-System Programming
EEPROM	Electrically Erasable Programming Read Only Memory
SRAM	Static Random Access Memory
USART	Universal Serial Asynchronous Receiver Transmitter
SPI	Serial Peripheral Interface
PDA	Personal Digital Assistant
PC	Personal Computer
LED	Light Emitting Diode
CO	Carbon Monoxide
RPM	Rotation per Minute
PPM	Parts Per Million

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In India, most of the accidents occur due to over speeding and rash driving of vehicles on public roads. Recent studies show that one third of the number of fatal or serious accidents are associated with over speed. Reduction of the number of accidents is a big concern for traffic authorities, the automotive industry and transport research groups. Researches indicate that higher safety will be achieved by automatic driving controls and a growing number of sensors both on the road infrastructure and the vehicle itself. Apart from these factors, pollution is a big threat to our society. A system is developed in order to provide a feasible solution for the aforementioned problems.

1.2 MOTIVATION FOR THE PROJECT

The major source of pollution, which is a serious threat to the society, is from the automobiles. To check the level of carbon monoxide, one of the pollutants, one has to access the smoke inspection center. This does not prove to be very effective. So, a system is devised to check the level of carbon monoxide emitted from the vehicle. The system can be installed in any automobile. It is used to sense and display the amount of carbon monoxide emitted from the vehicle during the runtime of the vehicle itself. The carbon monoxide module consists of a carbon monoxide sensor (MQ7), which is used to program Arduino. To avoid accidents due to over speeding in areas nearby schools, hospitals and residential areas, a speed control module has been devised.

1.3 ORGANISATION OF THE PROJECT

Chapter 2 gives the description of three different modules of Pollution control and accident avoidance system.

Chapter 3 concludes the project and briefs about the future scope on betterment of the system and explains the various applications.

CHAPTER 2

POLLUTION CONTROL AND ACCIDENT AVOIDANCE SYSTEM FOR A CAR

2.1 OVERVIEW OF THE PROJECT

The ultimate aim of this project is to monitor the carbon monoxide level emitted by the automobiles, to reduce the accidents that are caused due to over speeding of the vehicles and to alert the driver in drowsiness. To realize the objectives of this project, three modules namely Eye Blink Monitoring module, Carbon Monoxide Monitoring module, and Automatic Speed Control module are used.

The block diagram of the transmitter is shown in Figure 2.1. The transmitter block diagram consists of three blocks namely Arduino UNO, IR transmitter and RF transmitter. The RF transmitter emits radio frequency signals at a frequency of 433.92 MHz. The IR transmitter is powered by the Arduino UNO and it transmits the Infrared signal. The IR transmitter is placed at the exit of the specified zone in order to help the vehicle to regain it's speed.

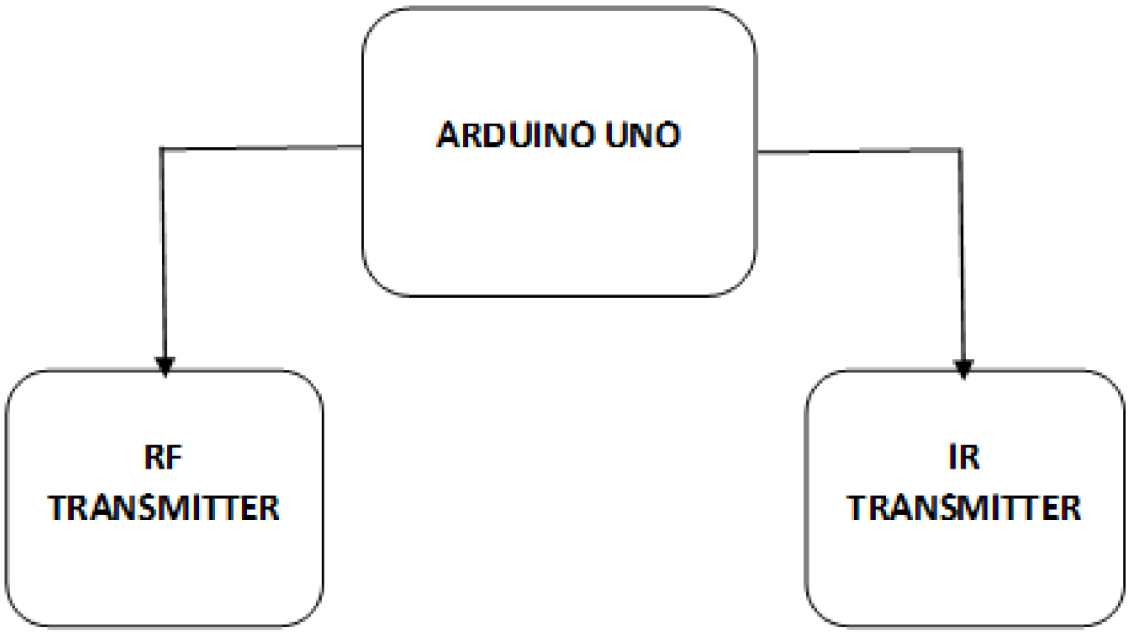

Figure 2.1: Block diagram of transmitter

Block diagram of the receiver is shown in Figure 2.2. The receiver is to be placed in the automobile. The receiver comprises of IR transceiver, IR receiver, RF receiver which works at a frequency of 433.92 MHz and carbon monoxide sensor, whose outputs are used to program Arduino UNO. The receiver section also consists of output devices such as display, alarm and DC motors. RF receiver is used to control the speed of the automobile as it enters into the specified zone and the IR receiver is useful to make the vehicle regain it's speed. IR transceiver, display, alarm and DC motors helps to alert the driver during weariness. Carbon monoxide sensor block is used to monitor the level of carbon monoxide and to display the level in a 16X2 LCD display.

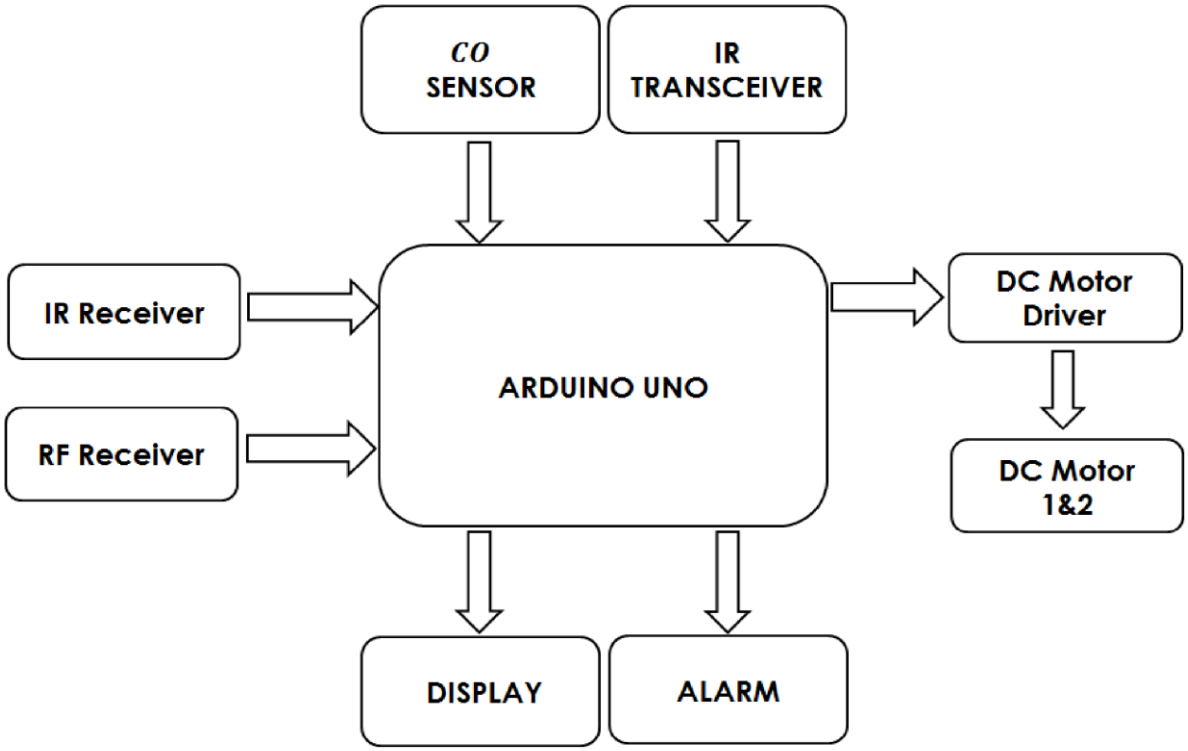

Figure2.2: Block diagram of Receiver

2.2 EYE BLINK MONITORING SYSTEM

The Eye Blink Monitoring module consists of an IR transceiver, motor driver, DC motors and a 16x2 LCD display interfaced with Arduino UNO. The block diagram of the Eye Blink Monitoring module is shown in Figure 2.3. The IR transceiver is powered by Arduino UNO. The IR transmitter transmits IR rays into the human eye and the light gets reflected back fully which is received by the IR receiver. When the eyes are closed, the transmitted IR rays are incident on the eyelid and are not fully reflected back to the IR receiver thus implying that the eyes are closed. When the eye is identified to be closed, a buzzer will sound and the vehicle stops. A message will also be displayed in the LCD. The normal eye blink rate does not affect the output of the system. This module has the highest priority than Automatic Speed Control module and Carbon Monoxide Monitoring module.

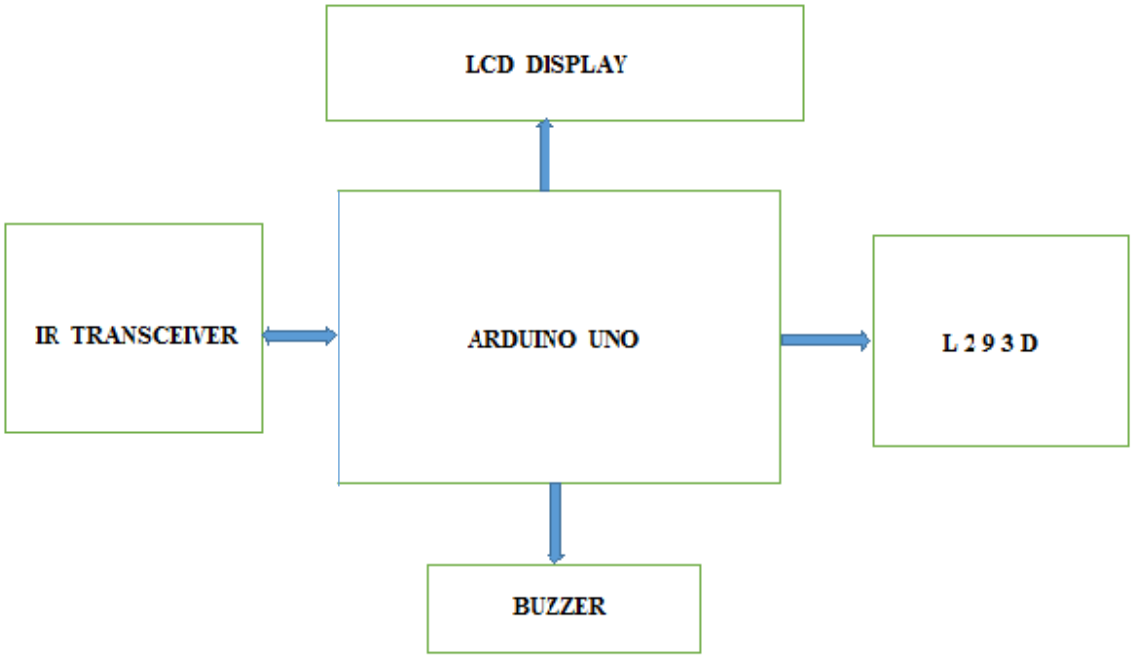

Figure 2.3 Block diagram of Eye Blink Monitoring system

The circuit diagram of Eye Blink Monitoring module is depicted in Figure 2.4. Output pins 4,5,6,7 of Arduino UNO (ATmega328P) are connected to the LCD display pins 12,11,6,4 respectively while the output from LCD (Pins 14 and 13) are connected to the input pins 2 and 3 of Arduino UNO. Output pins 8,9,10,11,12,13 of Arduino UNO (ATmega328P) are connected to the pins 7, 2,1,9,15,10 of motor driver (L293D) which drives two DC motors. Output pin 15 of Arduino UNO (ATmega328P) is connected to the supply of buzzer. Data pin of IR transceiver is connected to the analog input A2 pin of Arduino UNO (ATmega328P).

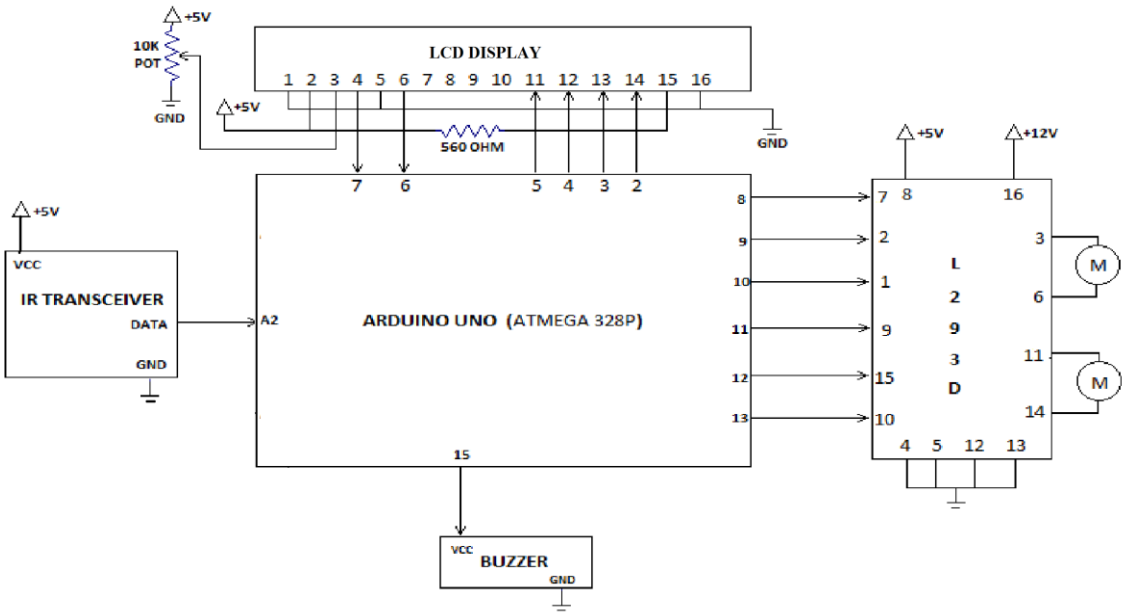

Figure 2.4: Circuit diagram of Eye Blink Monitoring system

2.2.1 Arduino UNO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, and a reset button. It has a stronger RESET circuit. It requires an operating voltage of 5V. The recommended input voltage is about 7-12V.The DC current per I/O pin is 40mA and for the 3.3V pin, the current output is 50 mA. ATmega 328 has a Static RAM of 2 KB and the EEPROM is about 1 KB. The clock speed of the microcontroller is 16 MHz.

ATMEGA328

The Atmel 8-bit AVR RISC-based microcontroller whose pin diagram is as shown in Figure 2.5 combines 32 KB ISP flash memory with read-while-write capabilities, 1 KB EEPROM, 2 KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit Analog to Digital converter , programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. The device achieves throughputs approaching 1 MIPS per MHz.

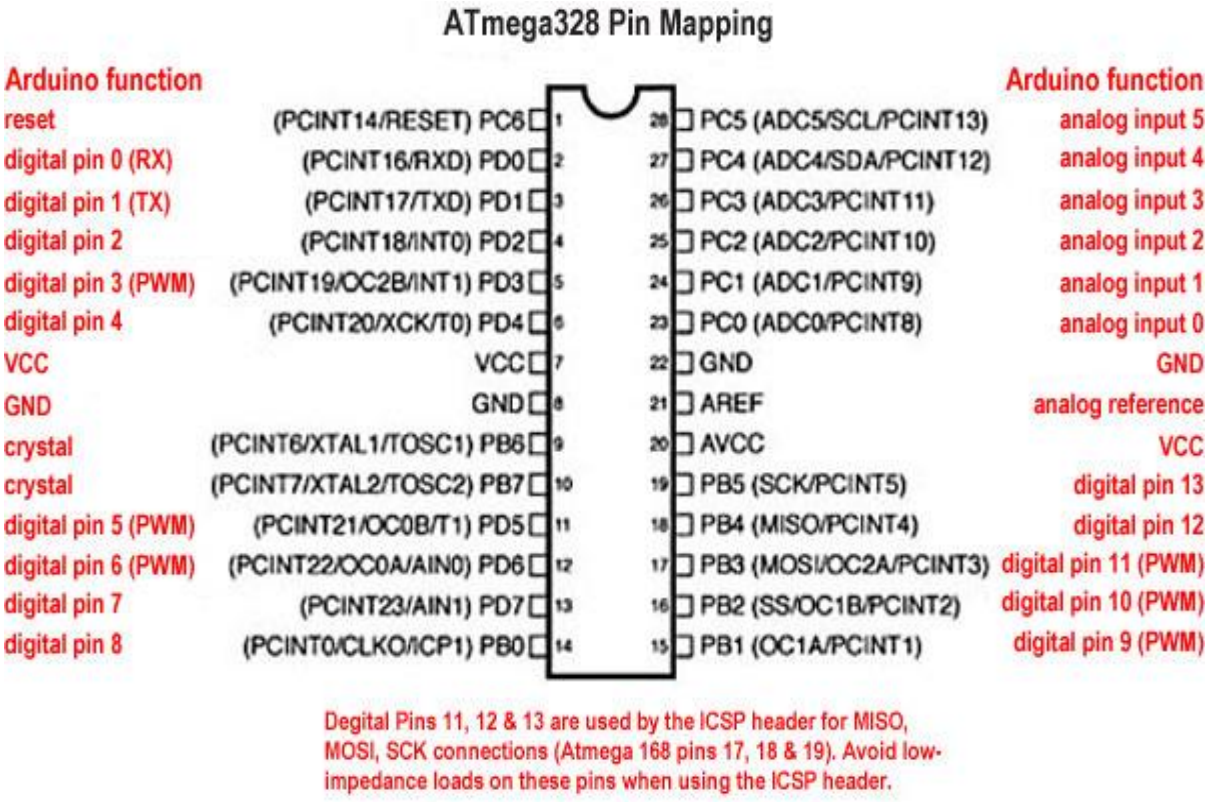

Figure 2.5: Pin mapping of ATmega328

2.2.2 IR Transceiver

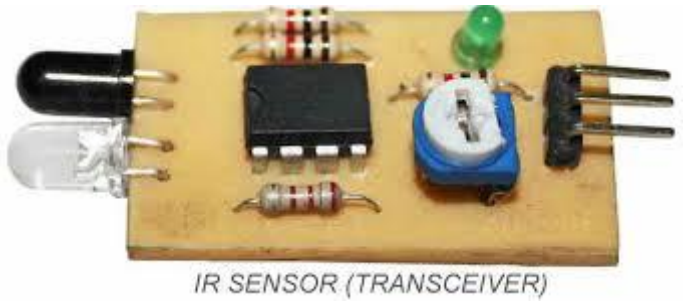

Figure 2.6: IR transceiver

An infrared transceiver, or IR transceiver shown in Figure 2.6, is capable of both sending and receiving infrared data. In other words, an IR transceiver is a transmitter and a receiver housed together in one single unit and having circuitry in common. The circuit diagram of IR transceiver is as shown in Figure 2.7. IR transceivers are often used for portable or mobile use. Some transceivers can do both functions at the same time, while other transceivers can only do one function at a time. The device may either have a focused beam, thus requiring it to be in a precise position in order to function properly, or it may be a broader beam, depending on the applications that it is designed for. IR transceivers are generally used in communications applications, although they also have other applications as well. In communications, infrared transceivers can often be used in order to synchronise devices. IR transceivers can also be used for entering and collecting data in the field. By using a handheld IR transceiver, a researcher can collect data on portable devices and then send it to a PC by using an infrared transceiver. The transceiver can also receive software upgrades, therefore keeping it up to date with the rest of the equipment in the laboratory or the plant.

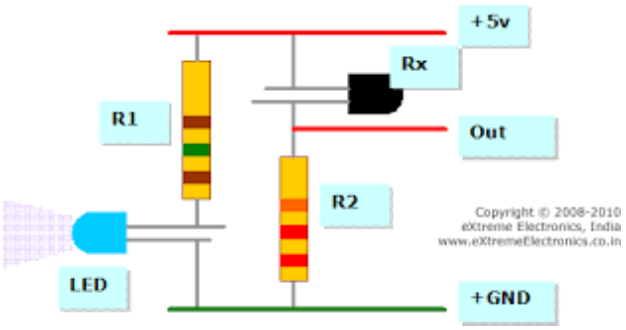

Figure 2.7: Circuit diagram of IR transceiver

2.2.3 Motor Driver

L293D is a dual H-bridge motor driver integrated circuit (IC). Pin diagram of L293D is shown in Figure 2.8. Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.

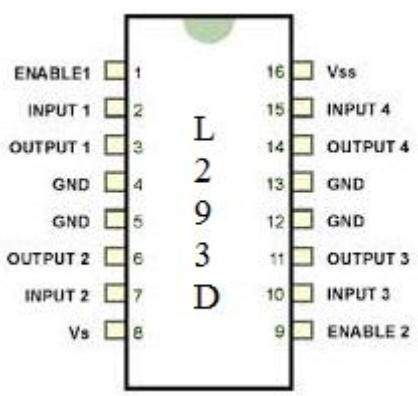

Figure 2.8: Pin diagram of motor driver

L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.

Enable pins 1 and 9 (corresponding to the two motors) must be high for motors to start operating. When an enable input is high, the associated driver gets enabled. As a result, the outputs become active and work in phase with their inputs. Similarly, when the enable input is low, that driver is disabled, and their outputs are off and in the high-impedance state.

The Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads (such as relays solenoids, DC and stepping motors) and switching power transistors. To simplify use as two bridges each pair of channels is equipped with an enable input. A separate supply input is provided for the logic, allowing operation at a lower voltage and internal clamp diodes are included. This device is suitable for use in switching applications at frequencies up to 5 kHz.

2.2.4 Gear Motor

Gear motors are complete motive force systems consisting of an electric motor and a reduction gear train integrated into one easy-to-mount and configure package. This greatly reduces the complexity, cost of designing and constructing power tools. It is used in machines and appliances, calling for high torque at relatively low shaft speed or RPM. Gear motors allow the use of economical, low-horsepower motors to provide great motive force at low speed such as in lifts, winches, medical tables, jacks and robotics. They can be large enough to lift a building or small enough to drive a tiny clock.

Most synchronous AC electric motors have output ranges from 1,200 to 3,600 revolutions per minute. They also have both normal speed and stall-speed torque specifications. The reduction gear trains used in gear motors are designed to reduce the output speed while increasing the torque. The increase in torque is inversely proportional to the reduction in speed. Reduction gearing allows small electric motors to move large driven loads, although more slowly than larger electric motors. Reduction gears consist of a small gear driving a larger gear. There may be several sets of these reduction gear sets in a reduction gear box.

Sometimes the goal of using a gear motor is to reduce the rotating shaft speed of a motor in the device being driven, such as in a small electric clock where the tiny synchronous motor may be spinning at 1,200 rpm but is reduced to one rpm to drive the second hand, and further reduced in the clock mechanism to drive the minute and hour hands. Here the amount of driving force is irrelevant as long as it is sufficient to overcome the frictional effects of the clock mechanism.

Another goal achievable with a gear motor is to use a small motor to generate a very large force at a low speed. These applications include the lifting mechanisms on hospital beds, power recliners, and heavy machine lifts where the great force at low speed is the goal.

Most industrial gear motors are AC-powered, fixed-speed devices, although there are fixed gear-ratio, variable-speed motors can provide a greater degree of control. DC gear motors are used primarily in automotive applications such as power winches on trucks, windshield wiper motors and power seat or power window motors.

2.2.5 LCD Display

LCD (Liquid Crystal Display) shown in Figure 2.9 is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special and even custom characters (unlike in seven segments), animations and so on.

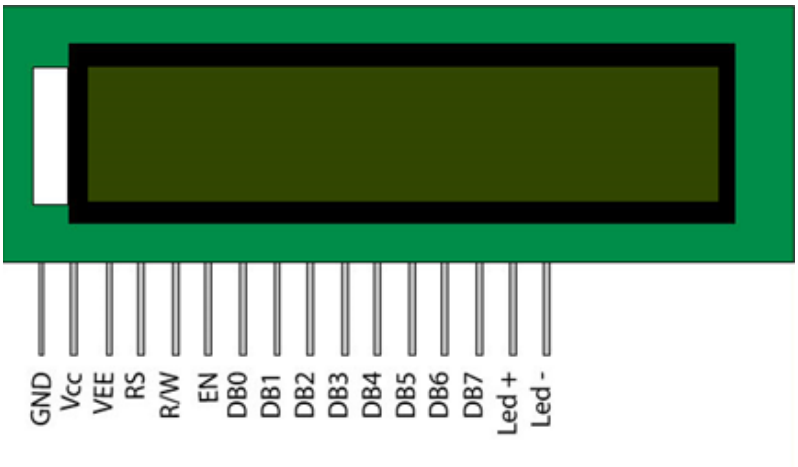

Figure 2.9: Pin description of LCD

The display contains two internal byte-wide registers, one for commands (RS=0) and the second for characters to be displayed (RS=1). A 16x2 LCD can display 16 characters per line and there are 2 such lines. In this LCD, each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the commands given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display, etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

2.3 CARBON MONOXIDE MONITORING SYSTEM

The block diagram of Carbon Monoxide Monitoring module consisting of Arduino UNO, carbon monoxide sensor (MQ7) and LCD is shown in Figure 2.10. The carbon monoxide sensor (MQ7) senses and displays the atmospheric carbon monoxide level in the LCD. The health effects caused by the exposure to carbon monoxide is given in Table 1. The threshold level is set to be **25 ppm**. When the carbon monoxide level exceeds the preset threshold value, a message will be displayed on the LCD. This module plays a major role in the control of pollution.

This module is prioritized next to the Automatic Speed Control module. This is because only a long term exposure to carbon monoxide gas will produce adverse effects on human lives, while the other two modules are of higher importance.

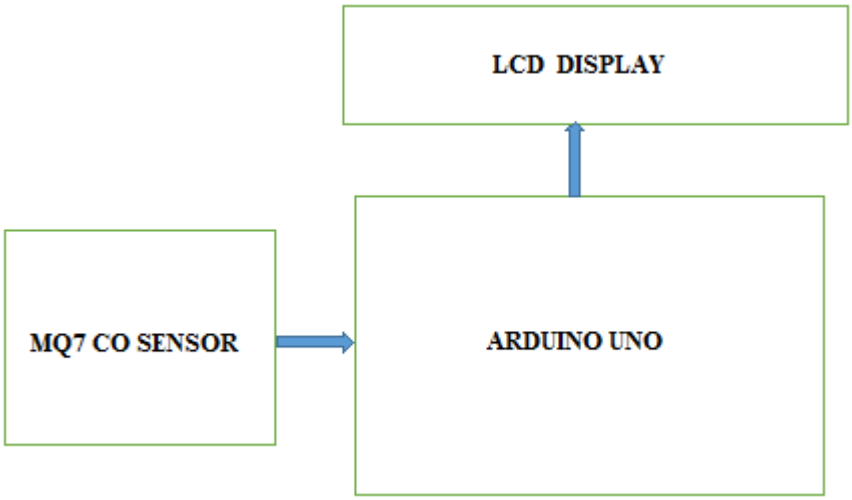

Figure 2.10: Block diagram of Carbon Monoxide Monitoring system

Table 1: Health hazards of carbon monoxide

Level of CO	Health Effects, and Other Information
0 PPM	Normal, fresh air.
9 PPM	Maximum recommended indoor CO level (ASHRAE).
10-24 PPM	Possible health effects with long-term exposure.
25 PPM	Max TWA Exposure for 8 hour work-day (ACGIH).
50 PPM	Maximum permissible exposure in workplace (OSHA).
100 PPM	Slight headache after 1-2 hours.
125 PPM	Causes headache
200 PPM	Dizziness, naseau, fagitue, headache after 2-3 hours of exposure.
400 PPM	Headache and nausea after 1-2 hours of exposure. Life threatening in 3 hours.
800 PPM	Headache, nausea, and dizziness after 45 minutes; collapse and unconsciousness after 1 hour of exposure. Death within 2-3 hours.
1000 PPM	Loss of consciousness after 1 hour of exposure.
1600 PPM	Headache, nausea, and dizziness after 20 minutes of exposure. Death within 1-2 hours.

The circuit diagram for Carbon Monoxide Monitoring module is as shown in Figure 2.11.Output pins 4,5,6,7 of Arduino UNO (ATmega328P) are connected to the LCD display pins 12,11,6,4 respectively while the output from LCD (Pins 14 and 13) are connected to the input pins 2 and 3 of Arduino UNO. Data pin of carbon monoxide sensor is connected to the analog input A3 pin of Arduino UNO (ATmega328P).

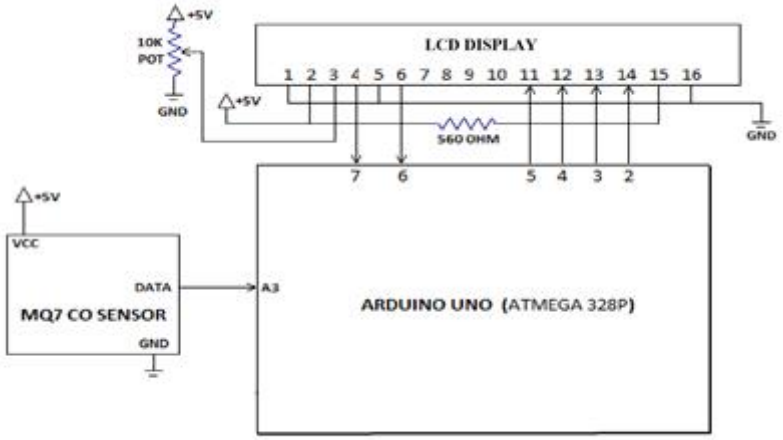

Figure 2.11: Circuit diagram of Carbon Monoxide Monitoring system

2.3.1 Carbon monoxide sensor

This is a simple-to-use carbon monoxide sensor, suitable for sensing carbon monoxide concentrations in the air. The MQ-7 can detect carbon monoxide gas concentrations anywhere from 20 TO 2000 PPM. It has a high sensitivity and fast response time. The sensor's output is an analog resistance. The drive circuit is very simple. It consists of a 5V power supply to power the heater coil, a load resistance. The output is connected to ADC. This sensor comes in a package similar to MQ-3 alcohol sensor, and can be used with a breakout board. It has a heater resistance of 28 to 34 ohms.

2.4 AUTOMATIC SPEED CONTROL SYSTEM

Automatic Speed Control Module comprises of IR and RF transmitter and receiver pair. The block diagram of Automatic Speed Control module is shown in Figure 2.12. It is used for controlling the speed of the automobile automatically on entering into particular zones such as

residential areas, schools, hospitals which are prone to accidents as a result of over speeding, particularly during the peak hours. These zones are provided with IR and RF transmitters. The RF transmitter is placed at the zone's entrance while the IR transmitter is placed at the exit of the zone. The RF receiver installed in the automobile receives the zonal information transmitted by the transmitter and automatically reduces the speed of the vehicle. A message is displayed in a 16X2 LCD thus helping the driver to identify the particular zone. At the exit of the zone, the IR transmitter is placed and it transmits the information about the exit of the zone to the IR receiver in the vehicle. Thus on exit from the zone the vehicle automatically regains its original speed.

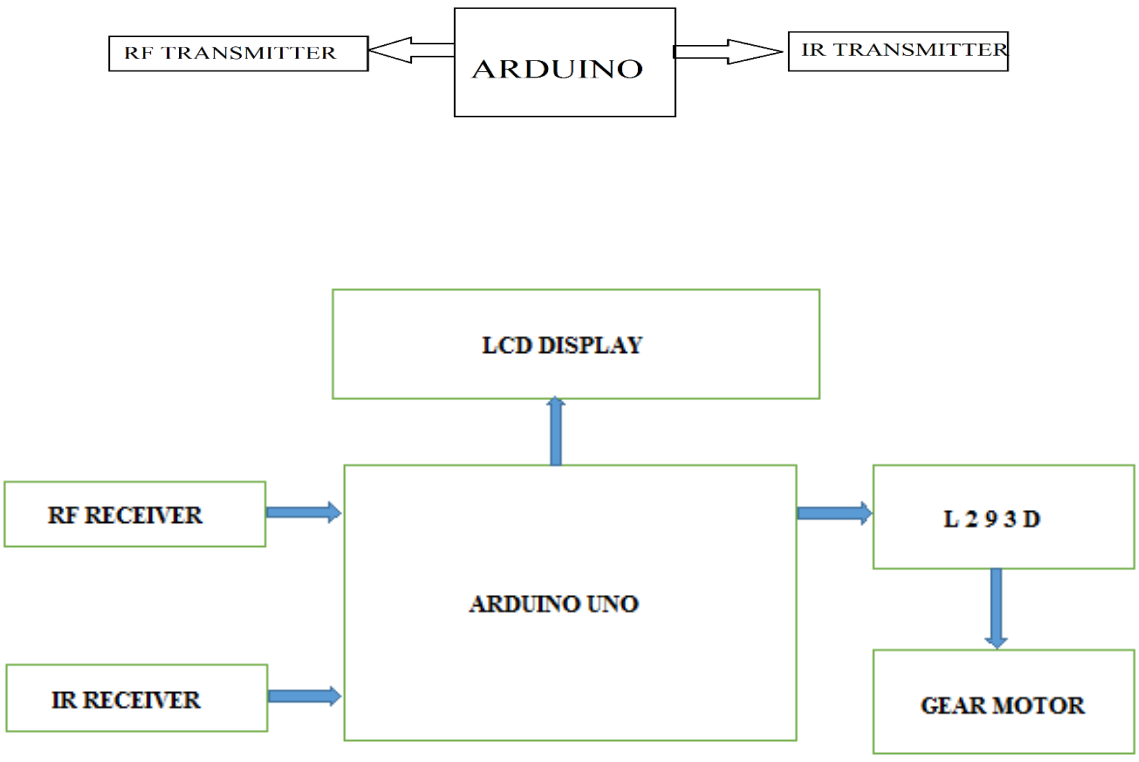

Figure 2.12: Block diagram of automatic speed control system (Transmitter and Receiver)

The circuit diagram of Automatic Speed Control module is shown in Figure 2.13. Output pins 8,9,10,11,12,13 of Arduino UNO (ATmega328P) are connected to the pins 7, 2,1,9,15,10 of motor driver (L293D). Output pins 4,5,6,7 of Arduino UNO (ATmega328P) are connected to the LCD display pins 12,11,6,4 respectively while the output from LCD (Pins 14 and 13) are connected to the input pins 2 and 3 of Arduino UNO. Analog pin A0 of Arduino UNO

which is converted into a digital pin using the function pinMode and the newly generated input pin 14 of Arduino UNO (ATmega328P) and is connected to the data pin of the RF receiver. Similarly analog pin A4 is converted to input pin 18 of Arduino UNO (ATmega328P) and connected to the IR receiver.

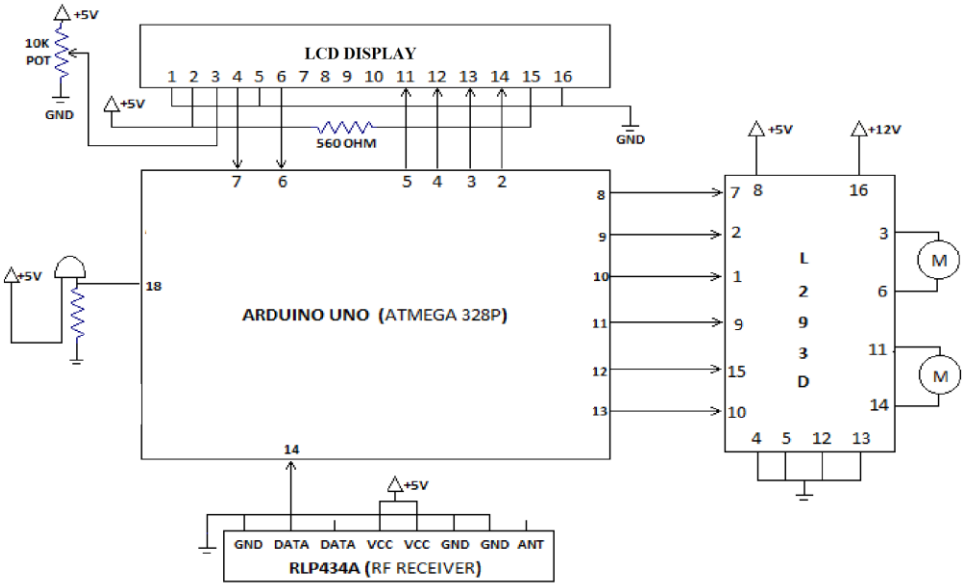

Figure 2.13: Circuit diagram of Automatic Speed Control system

This module is given the second priority among the three modules. The pulse width modulation pin of Arduino UNO is connected to the enable pin of the motor driver L293D to control the speed of the DC motor.

2.4.1 RF Transmitter

The RF module, as the name suggests, operates at Radio Frequency. In this RF system, the digital data is represented as variations in the amplitude of carrier wave. This kind of modulation is known as Amplitude Shift Keying (ASK). The RF transmitter (TLP434A) operates at a frequency of 433.92 MHz and has a datarate of 4800 bps. It has an operating voltage of 2-12V. The peak current is 1.64mA at 2V and 19.4mA at 12V. The RF power output of TLP434A is - 14 to 16 dBm.

Transmission through RF is better than IR (infrared) because of many reasons. Firstly, signals through RF can travel through larger distances making it suitable for long range applications. Also, while IR mostly operates in line-of-sight mode, RF signals can travel even when there is an obstruction between transmitter and receiver. Also, RF transmission is more strong and reliable than IR transmission. RF communication uses a specific frequency unlike IR signals which are affected by other IR emitting sources. A RF transmitter receives serial data and transmits it wirelessly through its antenna connected at pin 4. The transmission occurs at the rate of 1Kbps - 10Kbps

2.4.2 RF Receiver

The RF receiver module consists of the receiver RLP434A. It has an operating frequency of 433.92 MHz and the data rate is 4800 bps. RLP434A has an operating supply voltage of 3.3V to 6V. The operating current is 4.5 mA and the operation temperature is -20 to 80 C. It's sensitivity is 110dBm and the receiver turn on time is about 5 ms.

The transmission occurs at the rate of 1Kbps - 10Kbps. The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter.

The RLP434A which is a Compact Radio Receiver (RF) works directly with the TLP434A transmitter on an operating frequency of 433.92MHz. Ideal for many applications, including robots, where commands can be sent directly to the robot, without the need for a hard-wired connection. Suitable for data rates of up to 4.8 KHz, and the typical operating current is only 4.5mA.

2.4.3 IR Transmitter

An IR LED, also known as IR transmitter, is a special purpose LED that transmits infrared rays in the range of 760 nm wavelength. Such LEDs are usually made of gallium arsenide or aluminum gallium arsenide. An infrared emitter, or IR emitter, is a source of light energy in the infrared spectrum. It is a light emitting diode (LED) that is used in order to transmit infrared signals from a remote control. In general, the more they are in quantity and the better the emitters are, the stronger and wider the resulting signal is. A remote with strong emitters can often be used without directly pointing at the desired device. Infrared emitters are also partly responsible for limits on the range of frequencies that can be controlled. An IR emitter generates infrared light that transmits information and commands from one device to another. Typically one device receives the signal then passes the infrared (IR) signal through

the emitter to another device. Infrared emitters can be found in several industries. The pin description of IR transmitter is shown in Figure 2.13.

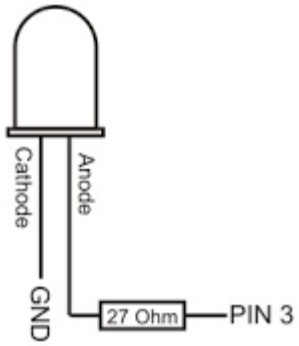

Figure 2.13: Pin description of IR transmitter

The appearance is same as a common LED. Since the human eye cannot see the infrared radiations, it is not possible for a person to identify whether the IR LED is working or not, unlike a common LED. To overcome this problem, the camera on a cellphone can be used. The camera can show us the IR rays being emanated from the IR LED in a circuit.

A common modulation scheme for IR communication is something called 38 kHz modulation. There are very few natural sources that have the regularity of a 38 kHz signal, so an IR transmitter sending data at that frequency would stand out among the ambient IR. 38 kHz modulated IR data is the most common, but other frequencies can be used.

An electroluminescent IR LED is a product which requires care in use. IR LEDs are fabricated from narrow band hetero structures with energy gap from 0.25 to 0.4 eV. Infra-red transmitter emits IR rays in planar wave front manner. Even though Infra-red rays spreads in all directions, it propagates along straight line in forward direction. IR have the characteristics of producing secondary wavelets when it collides with any obstacles in its path. This property of IR is used here.

When IR rays gets emitted from LED, it moves in the direction it is angled. When any obstacle interferes in the path, the IR rays get cut and it produces secondary wavelets which propagates mostly in return direction or in a direction opposite to that of the primary waves, which produces the net result like reflection of IR rays

2.4.4 IR Receiver

With low power consumption and an easy to use package, it mates well with embedded electronics and can be used with common IR remotes. An infrared receiver, or IR receiver, is hardware that sends information from an infrared remote control to another device by receiving and decoding signals. In general, the receiver outputs a code to uniquely identify the infrared signal that it receives. This code is then used in order to convert signals from the remote control into a format that can be understood by the other device. It is the part of a device that receives infrared commands from a remote control. Because infrared is light, it requires line-of-sight visibility for the best possible operation, but can however still be reflected by items such as glass and walls. Poorly placed IR receivers can result in what is called "tunnel vision", where the operational range of a remote control is reduced because they are set so far back into the chassis of a device.

Infrared receivers can often be found in consumer products such as television remote controls or infrared ports such as PDAs, laptops, and computers. They are also present in devices such as home theatres, cable or satellite receivers, Blu-Ray players and audio amplifiers. Infrared receivers can also be found in the industrial, military, aerospace and photography markets.

CHAPTER 3

CONCLUSION

3.1 SUMMARY

The Eye Blink Monitoring module helps to avoid the accidents caused due to drowsiness of the driver, thus ensuring safety of the passengers. The Automatic Speed Control module is beneficial as it will be of great help to control the accidents in residential areas. Carbon Monoxide Monitoring module is useful in controlling pollution.

3.2 FUTURE ENHANCEMENT

Implementation of GPS in Eye Blink Monitoring System to park the vehicle automatically on account of the drowsiness of the driver. Identification of specific zones and variation of speed according to the zone. Variation of the vehicle speed with respect to the time. Continuously monitoring other gases such as carbon-di-oxide , nitrogen oxide in addition to carbon monoxide. Pushing the data to a government server if the level of carbon monoxide exceeds

3.3 APPLICATIONS

Eye Blink Monitoring System can be implemented in vehicles such as cars, lorries, buses to help the drivers during night travel. Automatic Speed Control systems can be used near school zones, residential areas, hospitals to reduce the rate of accidents. By implementing Carbon Monoxide Monitoring System in automobiles, continuous monitoring of carbon monoxide is possible which helps in pollution control. Eye Blink Monitoring system also finds applications in places where continuous monitoring is required such as security cabins and nuclear power stations. Eye Blink Monitoring can also be used in the cockpit of aeroplane. Carbon Monoxide Monitoring can also be used to check the level of emission in industries.

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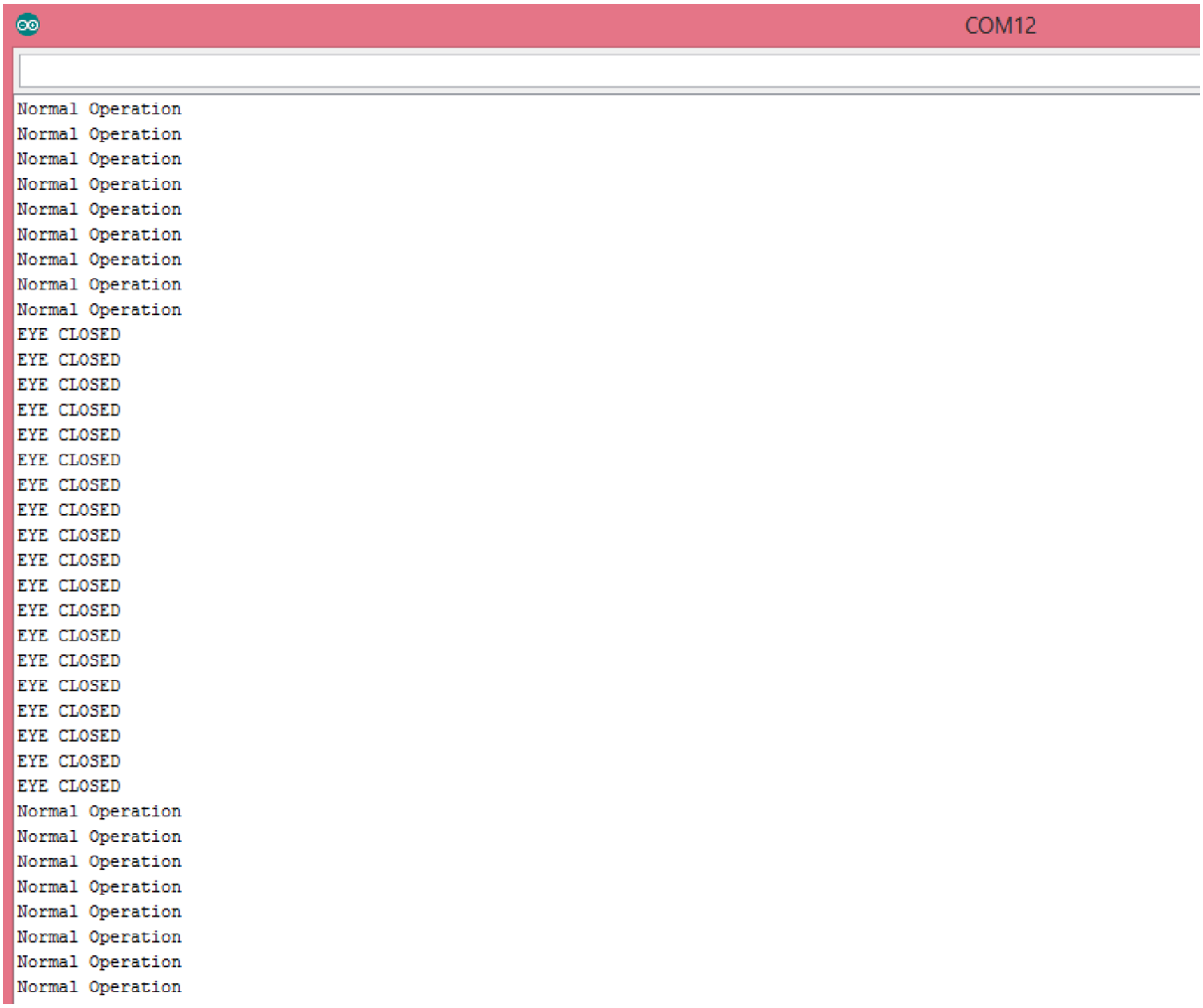
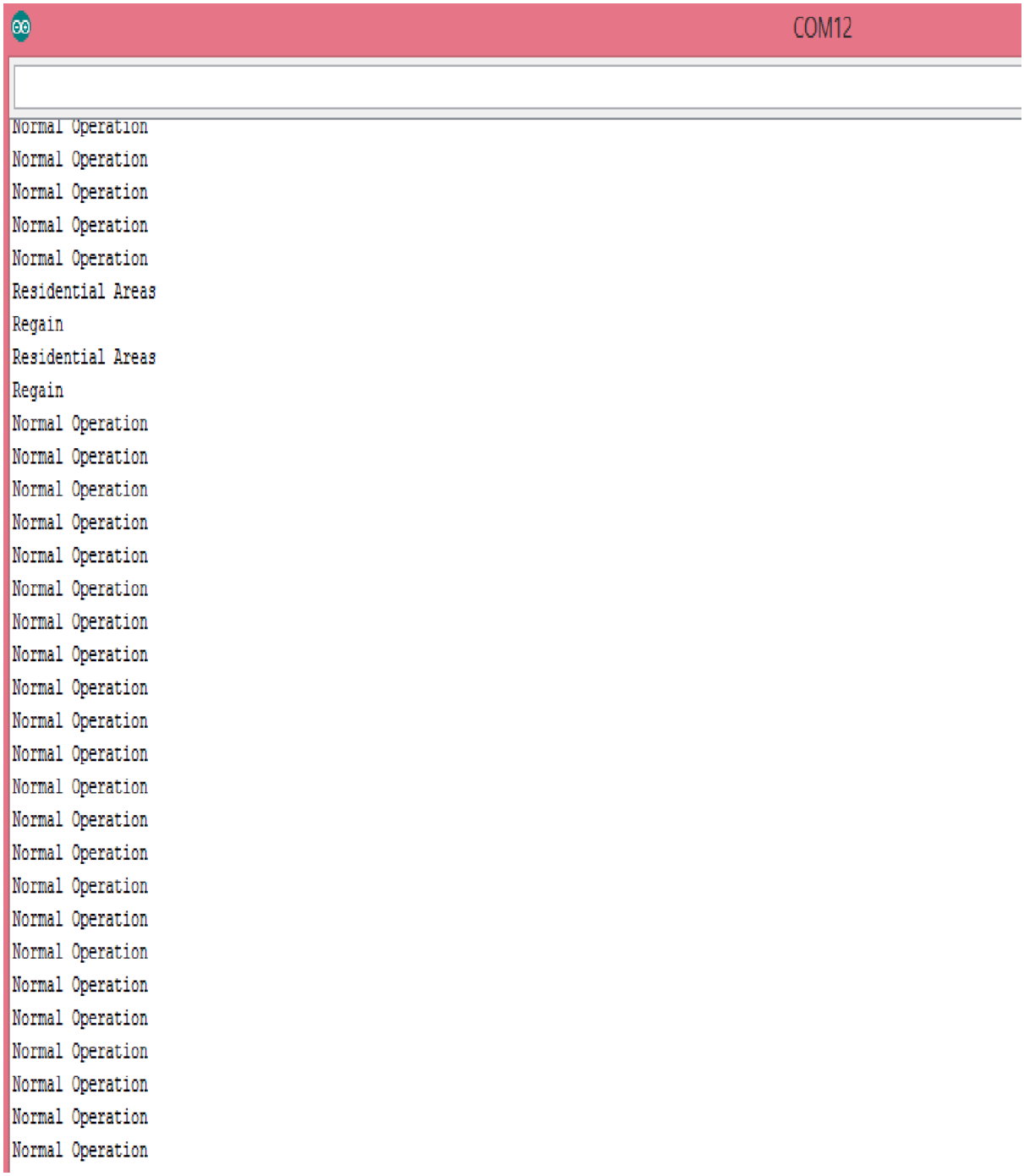
APPENDIX

A. SCREENSHOTS




COM12
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B. PIN DESCRIPTION OF L293D (MOTOR DRIVER)

Table 2: Pin description of motor driver

Pin No	Function	Name
1	Enable pin for Motor 1; active high	Enable 1,2
2	Input 1 for Motor 1	Input 1
3	Output 1 for Motor 1	Output 1
4	Ground (0V)	Ground
5	Ground (0V)	Ground
6	Output 2 for Motor 1	Output 2
7	Input 2 for Motor 1	Input 2
8	Supply voltage for Motors; 9-12V (up to 36V)	Vcc 2
9	Enable pin for Motor 2; active high	Enable 3,4
10	Input 1 for Motor 1	Input 3
11	Output 1 for Motor 1	Output 3
12	Ground (0V)	Ground
13	Ground (0V)	Ground
14	Output 2 for Motor 1	Output 4
15	Input2 for Motor 1	Input 4
16	Supply voltage; 5V (up to 36V)	Vcc1

C. PIN DESCRIPTION OF LCD

Table 3: Pin description of LCD display

Pin No	Function	Name
1	Ground (0V)	Ground
2	Supply voltage; 5V (4.7V – 5.3V)	Vcc
3	Contrast adjustment; through a variable resistor	V_{EE}
4	Selects command register when low; and data register when high	Register Select
5	Low to write to the register; High to read from the register	Read/write
6	Sends data to data pins when a high to low pulse is given	Enable
7	8-bit data pins	DB0
8		DB1
9		DB2
10		DB3
11		DB4
12		DB5
13		DB6
14		DB7
15	Backlight V_{CC} (5V)	LED+
16	Backlight Ground (0V)	LED-

D. PIN DESCRIPTION OF TLP434A (RF TRANSMITTER)

Table 4: Pin description of RF transmitter

Pin No	Function	Name
1	Ground (0V)	Ground
2	Serial data input pin	Data
3	Supply voltage; 5V	Vcc
4	Antenna output pin	ANT

E. PIN DESCRIPTION OF RLP434A (RF RECEIVER)

Table 5: Pin description of RF receiver

Pin No	Function	Name
1	Ground (0V)	Ground
2	Serial data output pin	Data
3	Linear output pin; not connected	NC
4	Supply voltage; 5V	Vcc
5	Supply voltage; 5V	Vcc
6	Ground (0V)	Ground
7	Ground (0V)	Ground
8	Antenna input pin	ANT

F. SPECIFICATIONS OF MQ7 (CARBON MONOXIDE SENSOR)

- Power supply needs: 5V
- Interface type: Analog
- Pin Definition: 1-Output 2-GND 3-VCC
- High sensitivity to carbon monoxide
- Fast response
- Stable and long life
- Size: 40x20mm

G. PIN DESCRIPTION OF ATMEGA328P

VCC Digital supply voltage.

GND Ground.

Port B (PB7:0) XTAL1/XTAL2/TOSC1/TOSC2
Port B is an 8-bit bi-directional I/O port with internal pull-up resistors. The Port B output buffers have symmetrical drive characteristics with both high sink and source capability.

Port C (PC5:0)
Port C is a 7-bit bi-directional I/O port with internal pull-up resistors. The PC5. 0 output buffers have symmetrical drive characteristics with both high sink and source capability.

PC6/RESET
If the RSTDISBL Fuse is programmed, PC6 is used as an I/O pin. Note that the electrical characteristics of PC6 differ from those of the other pins of Port C.

Port D (PD7:0)
Port D is an 8-bit bi-directional I/O port with internal pull-up resistors. The Port D output buffers have symmetrical drive characteristics with both high sink and source capability.

AV$_{CC}$
AVCC is the supply voltage pin for the A/D Converter, PC3:0, and ADC7:6. It should be externally connected to VCC, even if the ADC is not used. If the ADC is used, it should be connected to VCC through a low-pass filter.

AREF
AREF is the analog reference pin for the A/D Converter.

ADC7:6 (TQFP and QFN/MLF Package Only)
In the TQFP and QFN/MLF package, ADC7:6 serve as analog inputs to the A/D converter. These pins are powered from the analog supply and serve as 10-bit ADC channels.