# ADVANCED ATM SECURITY SYSTEM

**A PROJECT REPORT**


***Submitted by***

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***of***

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**IN**

**ELECTRONICS AND COMMUNICATION ENGINEERING**


**KUMARAGURU COLLEGE OF TECHNOLOGY**

**COIMBATORE-641049**

**(An Autonomous Institution Affiliated to Anna University, Chennai)**


**APRIL 2015**

# KUMARAGURU COLLEGE OF TECHNOLOGY

# COIMBATORE-641049

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## BONAFIDE CERTIFICATE

Certified that this project report titled **"ADVANCED ATM SECURITY SYSTEM"** is the bonafied work of "**NAVIN.S, GOPALAKRISHNAN.K.K, NISANTH.M, SIVAKUMAR.A.S"** who carried out the project work under my supervision.

| | |
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**INTERNAL EXAMINER** **EXTERNAL EXAMINER**

## ACKNOWLEDGEMENT

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# ABSTRACT

Main aim of this project is to prevent the ATM theft. As soon as the customer enters the ATM center he should switch ON the Bluetooth in his mobile. Already the registered customer would have Android Application installed in his device with a unique password. Now the customer should open his application and enter his corresponding Password and login into the app. The ATM verifies the authentication process, if it passes authentication the customer enters the ATM PIN through Matrix Keypad and he can proceed with his transaction. In case of wrong authentication the ATM shutter closes and the provided webcam takes a snap of that person through MATLAB (PC). Then the image is saved in PC and processed with further steps. Operating voltage of Controller is the (0-5) v and the operating frequency is the (4-20) Mhz. LCD is used to know the current status of the process.

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# CHAPTER 1

## 1.1 INTRODUCTION

Our project can be used to improve the security performance in our present unsecure ATM centers. Nowadays many unavoidable security issues are encountered in our ATM centers. Bank accounts can be accessed by unauthorized user if the smart card secure pin is known. So to avoid this security issues we are upgrading the present ATM system with card less accessing model by using Android application with Matlab software (PC). The customers can increase their security level by installing the Android application with unique passwords.

# CHAPTER 2

# 2 BLOCK DIAGRAM

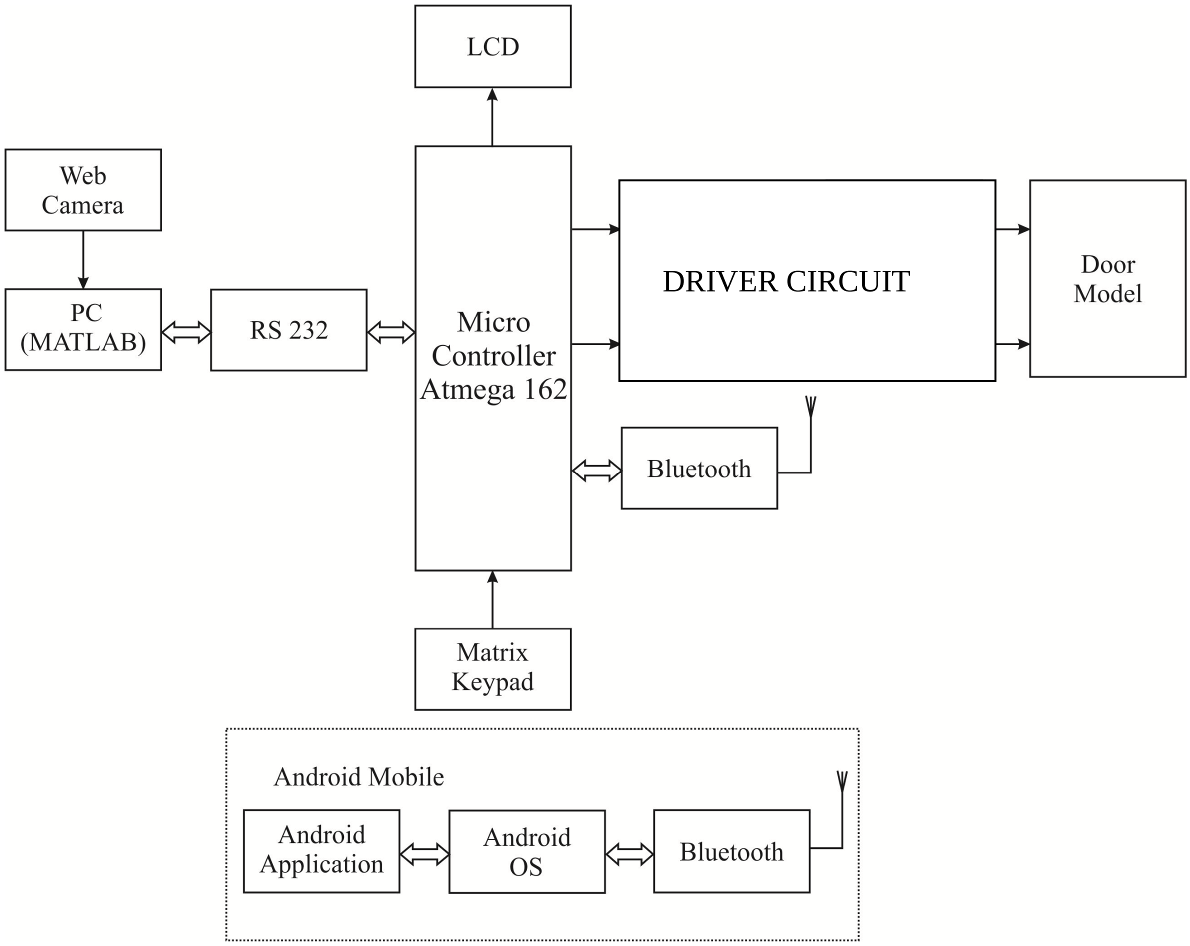



Fig no: 2.1 BLOCK DIAGRAM

## 2.1 BLOCK DIAGRAM EXPLANATION

As soon as the customer enters the ATM center they should Switch ON the Bluetooth in their mobile. Already the registered customer would have Android Application installed in their device with a Unique Password. Now the customer should open their application and enter their corresponding Password and login into the app. The ATM verifies the authentication process, if it passes authentication the customer enters the ATM PIN through Matrix Keypad and they can proceed with their transaction. In case of wrong authentication the ATM shutter closes and the provided webcam takes a snap of that person through MATLAB (PC). Then the image is saved in PC for processing further steps.

## 2.2 CRICUIT DIAGRAM

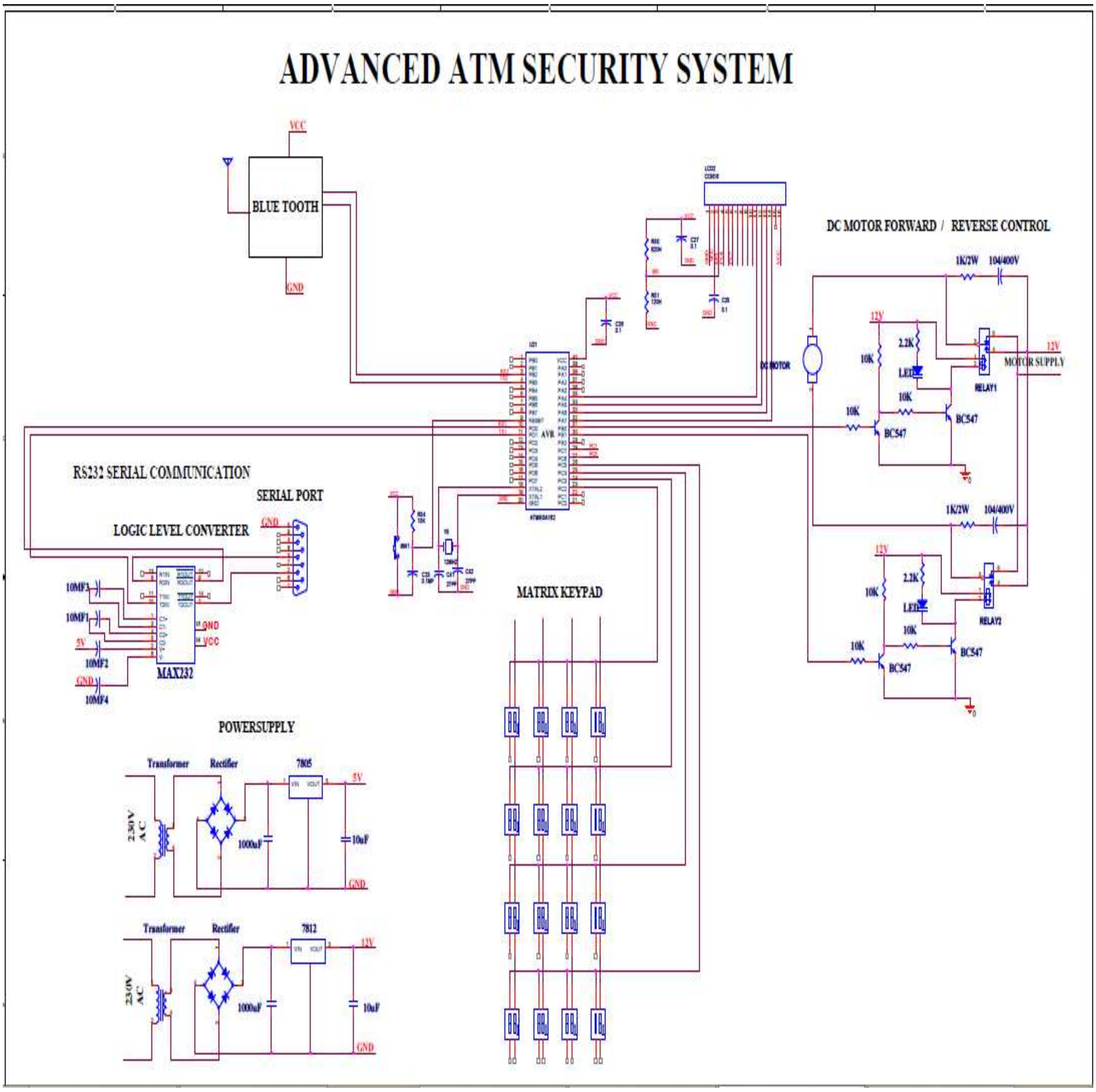



Fig no: 2.2 CIRCUIT DIAGRAM

### 2.2.1 POWER SUPPLY

The present chapter introduces the operation of power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage. The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.

### 2.2.2 MICROCONTROLLER ATMEGE162

The ATmega162 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega162 achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

### 2.2.3 BLUETOOTH

Bluetooth wireless technology is becoming a popular standard in the communication arena, and it is one of the fastest growing fields in the wireless technologies. It is convenient, easy to use and has the bandwidth to meet most of today’s demands for mobile and personal communications. Bluetooth technology handles the wireless part of the communication channel; it transmits and receives data wirelessly between these devices. It delivers the received data and receives the data to be transmitted to and from a host system through a host controller interface (HCI).In this Bluetooth is interfaced with controller by using UART.

### 2.2.4 LCD

Liquid crystal cell displays (LCDs) are used in similar applications where LEDs are used. These applications are display of numeric and alphanumeric characters in dot matrix and segmental displays. The display used here is 16×2 and it is connected to µc through port3 pins as inputs pins to the LCD 4, 5, 6, 11, 12, 13, and 14.

### 2.2.5 RS232

RS-232 is a standard for serial binary data interconnection between a DTE (Data terminal equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports.

### 2.2.6 DRIVER CIRCUIT

Driver circuit is designed to control the DC motor in the forward and reverse direction. The L298 is an integrated monolithic circuit in a 15-lead Multiwatt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor.

### 2.2.7 KEYPAD

In a key pad it has a one or more than one key are placed in a PCB. And all the keys are commonly grounded. This is the main difference to compared to matrix keypad. These key pads have maximum 8 numbers of keys. More than 8 keys are cannot be connected because it’s not an efficient one. If we need more than 8 keys means, then only we can operate it a matrix keypad.

# CHAPTER 3

## 3.1 POWER SUPPLY

Since all electronic circuits work only with low D.C. voltage we need a power supply unit to provide the appropriate voltage supply. This unit consists of transformer, rectifier, filter and regulator. A.C. voltage typically 230V is connected to a transformer which steps that AC voltage down to the level to the desired AC voltage. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a DC voltage. This resulting DC voltage usually has some ripple or AC voltage variations. regulator circuit can use this DC input to provide DC voltage that not only has much less ripple voltage but also remains the same DC value even the DC voltage varies somewhat, or the load connected to the output DC voltage changes. The power supply unit is a source of constant DC supply voltage. The required DC supply is obtained from the available AC supply after rectification, filtration and regulation.

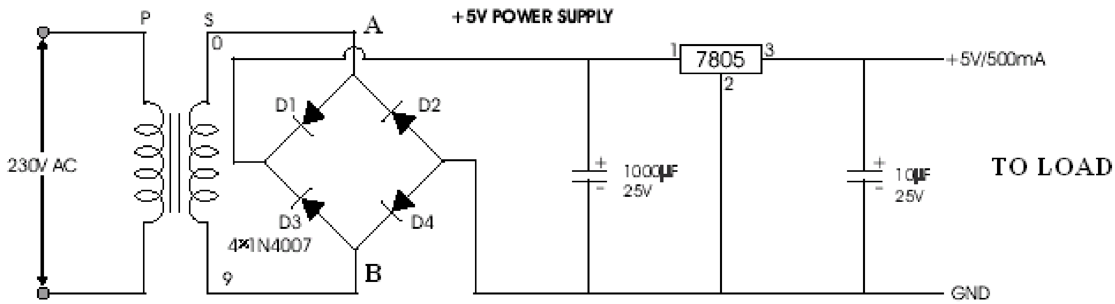



Fig no: 3.1 5V POWER SUPPLY CIRCUIT

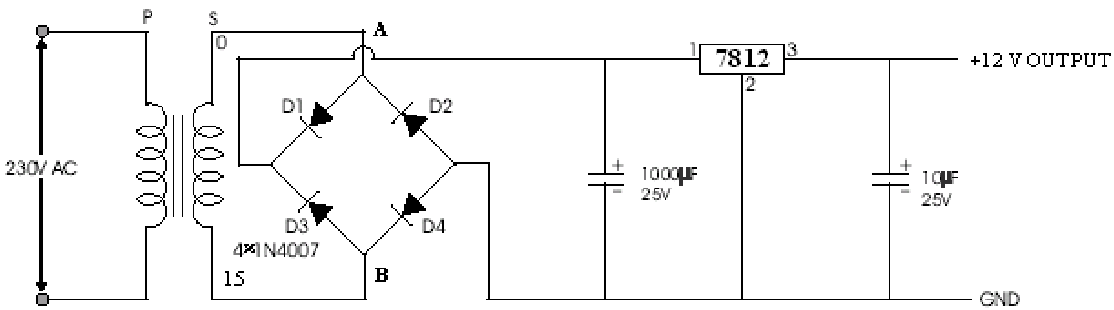



Fig no: 3.2 12V POWER SUPPLY CIRCUIT

The main components used in the power supply unit shown in fig 3.1 are Transformer, Rectifier, Filter, and Regulator. The 230V ac supply is converted into 12V ac supply through the transformer. The output of the transformer has the same frequency as in the input ac power. This ac power is converted into dc power through the diodes. Here the bridge diode is used to convert the ac supply to the dc power supply. This converted dc power supply has the ripple content and for the normal operation of the circuit, the ripple content of the dc power supply should be as low as possible. Because the ripple content of the power supply will reduce the life of circuit.

So to reduce the ripple content of the dc power supply, the filter is used. The filter is nothing but the large value capacitance. The output waveform of the filter capacitance will almost be the straight line.

### 3.1.1 TRANSFORMER

Transformer is a device used either for stepping-up or stepping-down of the AC supply voltage with a corresponding decreases or increases in the current. Here, a center-tapped transformer is used for stepping-down the voltage so as to get a voltage that can be regulated to get a constant 12V. In this project, to satisfy these requirements, we make use of 1.0A, 12V-0-12V transformer.

### 3.1.2 RECTIFIER

A rectifier is a device such as a semiconductor capable of converting sinusoidal input waveform units into a unidirectional waveform, with a non-zero average component.

### 3.1.3 FILTERS

Capacitors are used as filters in the power supply unit. Shunting the load with the capacitor, affects filtering. The action of the system depends upon the fact the capacitor stores energy during the conduction period and delivers this energy to the load during the inverse or non-conducting period. In this way, time during which the current passes through the load is prolonged and ripple is considerably reduced.

### 3.1.4 FIXED VOLTAGE REGULATOR

An IC7805 IC 7812 fixed voltage regulator is used in this circuit. The function of this regulator is to provide a +5V, +12V constant DC supply, even if there are fluctuations to the regulator input. This regulator helps to maintain a constant voltage throughout the circuit operation.

## 3.2 MICROCONTROLLER ATMEGA 162

### 3.2.1 INTRODUCTION:

The ATmega162 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega162 achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

### 3.2.2 PIN DISCRIPTION OF MICROCONTROLLER

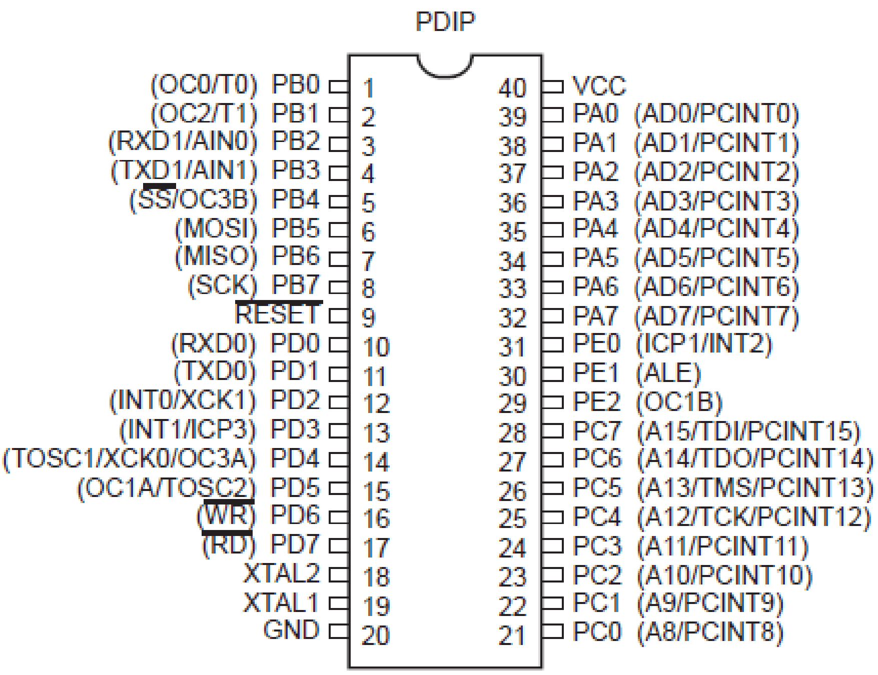



Fig no: 3.3 ATMEGA 162V PIN DIAGRAM

### 3.2.3 FEATURES:

- High-performance, Low-power AVR® 8-bit Microcontroller
- Advanced RISC Architecture
  - – 131 Powerful Instructions – Most Single-clock Cycle Execution
  - – 32 x 8 General Purpose Working Registers
  - – Fully Static Operation
  - – Up to 16 MIPS Throughput at 16 MHz
  - – On-chip 2-cycle Multiplier
- High Endurance Non-volatile Memory segments
  - – 16K Bytes of In-System Self-programmable Flash program memory
  - – 512 Bytes EEPROM
  - – 1K Bytes Internal SRAM
  - – Write/Erase cycles: 10,000 Flash/100,000 EEPROM
  - – Data retention: 20 years at 85°C/100 years at 25°C
  - – Optional Boot Code Section with Independent Lock Bits
    - In-System Programming by On-chip Boot Program
    - True Read-While-Write Operation
  - – Up to 64K Bytes Optional External Memory Space
  - – Programming Lock for Software Security
- JTAG (IEEE std. 1149.1 Compliant) Interface
  - – Boundary-scan Capabilities According to the JTAG Standard
  - – Extensive On-chip Debug Support
  - – Programming of Flash, EEPROM, Fuses, and Lock Bits through the JTAG Interface

- Peripheral Features
  - Two 8-bit Timer/Counters with Separate Prescalers and Compare Modes
  - Two 16-bit Timer/Counters with Separate Prescalers, Compare Modes, and Capture Modes
  - Real Time Counter with Separate Oscillator
  - Six PWM Channels
  - Dual Programmable Serial USARTs
  - Master/Slave SPI Serial Interface
  - Programmable Watchdog Timer with Separate On-chip Oscillator
  - On-chip Analog Comparator
- Special Microcontroller Features
  - Power-on Reset and Programmable Brown-out Detection
  - Internal Calibrated RC Oscillator
  - External and Internal Interrupt Sources
  - Five Sleep Modes: Idle, Power-save, Power-down, Standby, and Extended Standby
- I/O and Packages
  - 35 Programmable I/O Lines
  - 40-pin PDIP, 44-lead TQTQFP, and 44-pad MLF
- Operating Voltages
  - 1.8 - 5.5V for ATmega162V
  - 2.7 - 5.5V for ATmega162
- Speed Grades
  - 0 - 8 MHz for ATmega162V
  - 0 - 16 MHz for ATmega162

### 3.2.4 BLOCK DIAGRAM OF ATMEGA8 CONTROLLER

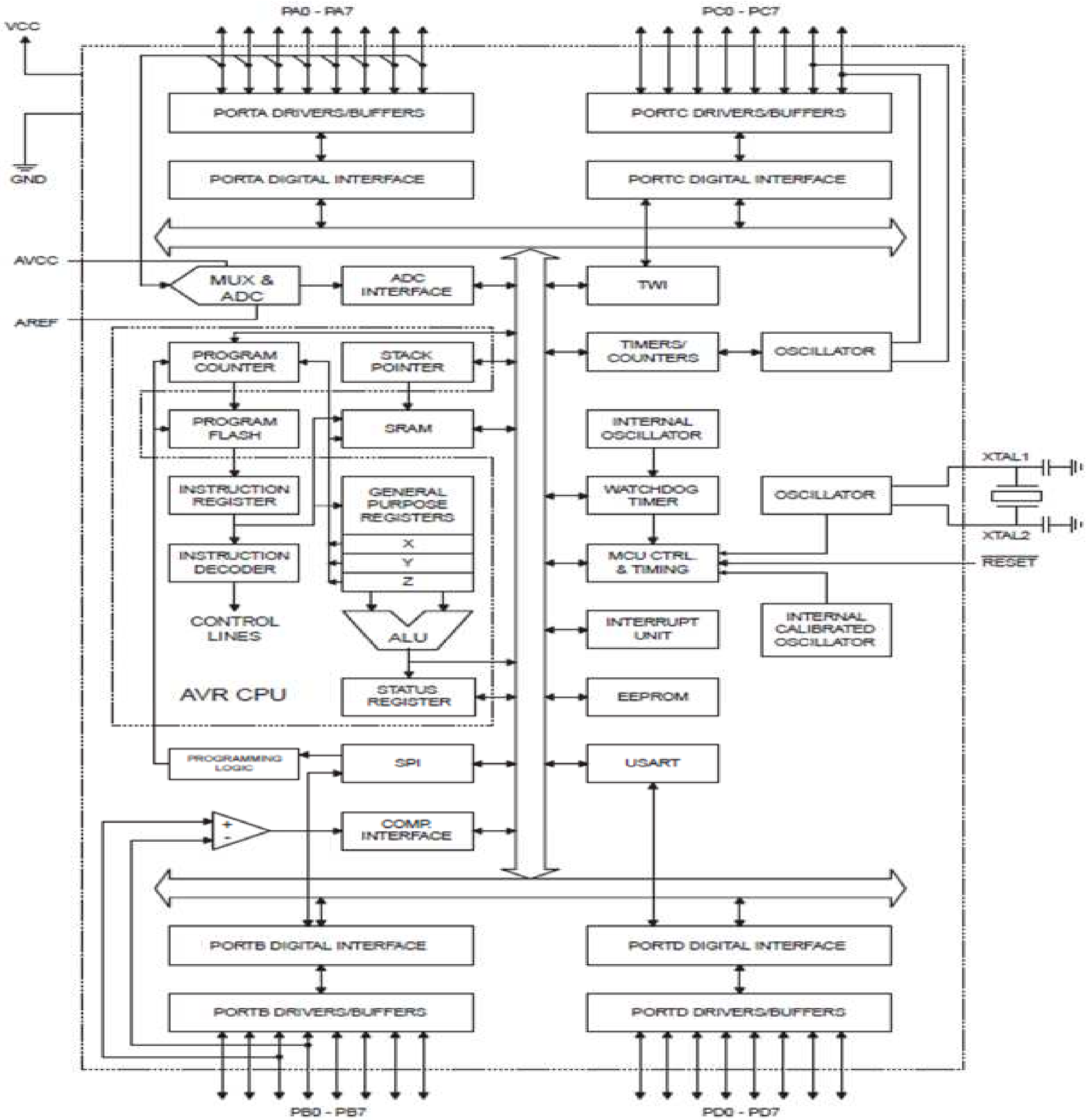



FIG NO: 3.4 BLOCK DIAGRAM OF ATMEGA8 CONTROLLER

Data memory that needs to be saved when there is no supply. It is usually used for storing important data that must not be lost if power supply suddenly stops. For instance, one such data is an assigned temperature in temperature regulators. If during a loss of power supply this data was lost, we would have to make the adjustment once again upon return of supply. Thus our device loses on self-reliance.

#### 3.2.4.3 RAM

RAM Data memory is used by a program during its execution. In RAM are stored all inter-results or temporary data during run-time.

#### 3.2.4.4 PORTS

Ports are physical connections between the microcontroller and the outside world.

#### 3.2.4.5 WATCHDOG TIMER

Free-Run Timer is an 8-bit register inside a microcontroller that works independently of the program. On every fourth clock of the oscillator it increments its value until it reaches the maximum (255), and then it starts counting over again from zero. As we know the exact.

#### 3.2.4.6 CENTRAL PROCESSING UNIT

CPU has a role of connective element between other blocks in the microcontroller. It coordinates the work of other blocks and executes the user program.

#### 3.2.4.7 ARITHMETIC LOGICAL UNIT

ALU ATMEGA micro MCUs contain an 8-bit ALU and an 8-bit working register. The ALU is a general purpose arithmetic and logical unit. It performs arithmetic and Boolean functions between the data in the working register and any register file.

### 3.2.4.8 PROGRAM COUNTER

The program counter (PC) specifies the address of the instruction to fetch for execution. The PC is 13-bits wide. The low byte is called the PCL register. This register is readable and writable. The high byte is called the PCH register. This register contains the PC<12:8> bits and is not directly readable or writable. All updates to the PCH register go through the PCLATH register.

### 3.2.4.9 STACK

The ATMEGAX family has an 8-level deep x 13-bit wide hardware stack. The stack space is not part of either program or data space and the stack pointer are not readable or writable. The PC is PUSHED onto the stack when a CALL instruction is executed, or an interrupt causes a branch. The stack is POPED in the event of a RETURN, RETLW or a RETFIE instruction execution. PCLATH is not affected by a PUSH or POP operation. The stack operates as a circular buffer. This means that after the stack has been PUSHED eight times, the ninth push overwrites the value that was stored from the first push. The tenth push overwrites the second push (and so on).

### 3.2.4.10 CLOCK GENERATOR - OSCILLATOR

Oscillator circuit is used for providing a microcontroller with a clock. Clock is needed so that microcontroller could execute a program or program instructions. Timing between each two increments of the timer contents, timer can be used for measuring time which is very useful with some devices

### 3.2.4.11 TYPES OF OSCILLATORS

ATMEGA8 can work with four different configurations of an oscillator. Since configurations with crystal oscillator and resistor-capacitor (RC) are the ones that are used most frequently, these are the only ones we will mention here.

Microcontroller type with a crystal oscillator has in its designation XT, and a microcontroller with resistor-capacitor pair has a designation RC.

### 3.2.4.12 RC OSCILLATOR

In applications where great time precision is not necessary, RC oscillator offers additional savings during purchase. Resonant frequency of RC oscillator depends on supply voltage rate, resistance R, capacity C and working temperature. It should be mentioned here that resonant frequency is also influenced by normal variations in process parameters, by tolerance of external R and C components, etc.

### 3.3 BLUETOOTH

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Invented by telecom vendor Ericsson in 1994,[5] it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

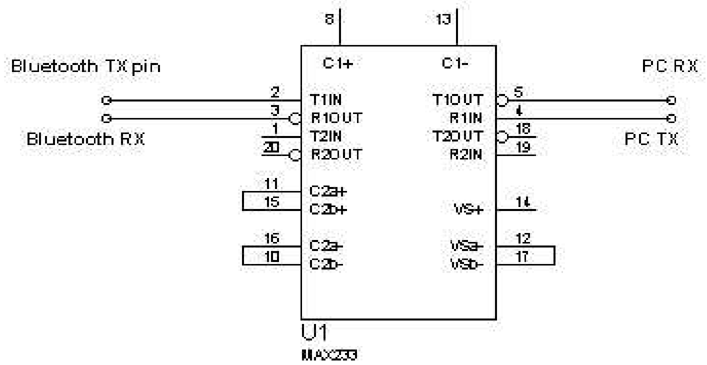



Fig no 3.5 BLUETOOTH PIN DIAGRAM

Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 25,000 member companies in the areas of telecommunication, computing, networking, and consumer electronics.[6] The IEEE standardized Bluetooth as **IEEE 802.15.1**, but no longer maintains the standard. The Bluetooth SIG oversees development of the specification, manages the qualification program, and protects the trademarks. A manufacturer must make a device meet Bluetooth SIG standards to market it as a Bluetooth device.[8] A network of patents applies to the technology, which are licensed to individual qualifying devices.

Bluetooth operates at frequencies between 2400 and 2483.5 MHz (including guard bands). This is in the globally unlicensed (but not unregulated) Industrial, Scientific and Medical (ISM) 2.4 GHz short-range radio frequency band. Bluetooth uses a radio technology called frequency-hopping spread spectrum. Bluetooth divides transmitted data into packets, and transmits each packet on one of 79 designated Bluetooth channels. Each channel has a bandwidth of 1 MHz. Bluetooth 4.0 uses 2 MHz spacing, which accommodates 40 channels. The first channel starts at 2402 MHz and continues up to 2480 MHz in 1 MHz steps. It usually performs 1600 hops per second, with Adaptive Frequency-Hopping (AFH) enabled.

Originally, Gaussian frequency-shift keying (GFSK) modulation was the only modulation scheme available. Since the introduction of Bluetooth 2.0+EDR, π/4-DQPSK (Differential Quadrature Phase Shift Keying) and 8DPSK modulation may also be used between compatible devices. Devices functioning with GFSK are said to be operating in basic rate (BR) mode where an instantaneous data rate of 1 Mbit/s is possible. The term Enhanced Data Rate (EDR) is used to describe π/4-DPSK and 8DPSK schemes, each giving 2 and 3 Mbit/s respectively. The "BR/EDR radio".

Bluetooth is a packet-based protocol with a master-slave structure. One master may communicate with up to seven slaves in a piconet. All devices share the master's clock. Packet exchange is based on the basic clock, defined by the master, which ticks at 312.5 µs intervals. Two clock ticks make up a slot of

625 µs, and two slots make up a slot pair of 1250 µs. In the simple case of single-slot packets the master transmits in even slots and receives in odd slots. The slave, conversely, receives in even slots and transmits in odd slots. Packets may be 1, 3 or 5 slots long, but in all cases the master's transmission begins in even slots and the slave's in odd slots.

### 3.3.1 COMMUNICATION AND CONNECTION

A master Bluetooth device can communicate with a maximum of seven devices in a piconet (an ad-hoc computer network using Bluetooth technology), though not all devices reach this maximum. The devices can switch roles, by agreement, and the slave can become the master (for example, a headset initiating a connection to a phone necessarily begins as master—as initiator of the connection, but may subsequently operate as slave).

The Bluetooth Core Specification provides for the connection of two or more Pico nets to form a scatter net, in which certain devices simultaneously play the master role in one piconet and the slave role in another.

At any given time, data can be transferred between the master and one other device (except for the little-used broadcast mode. The master chooses which slave device to address; typically, it switches rapidly from one device to another in a round-robin fashion. Since it is the master that chooses which slave to address, whereas a slave is (in theory) supposed to listen in each receive slot, being a master is a lighter burden than being a slave. Being a master of seven slaves is possible; being a slave of more than one master is difficult. The specification is vague as to required behavior in scatter nets.

## 3.4 LCD DISPLAY

Liquid crystal cell displays (LCDs) are used in similar applications where LEDs are used. These applications are display of display of numeric and alphanumeric characters in dot matrix and segmental displays.

LCDs are of two types:

I. Dynamic scattering type
II. Field effect type

### 3.4.1 Pin Diagram:

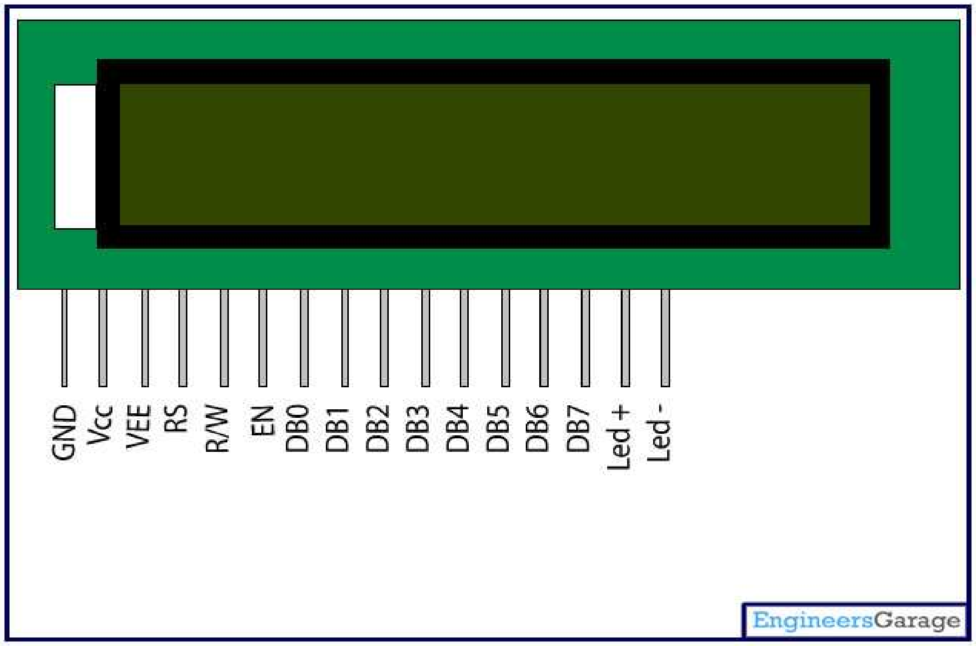



Fig no 3.6 LCD PIN DIAGRAM

When a potential is applied across the cell, charge carriers flowing through the liquid disrupt the molecular alignment and produce turbulence. When the liquid is not activated, it is transparent. When the liquid is activated the molecular turbulence causes light to be scattered in all directions and the cell appears to be bright. This phenomenon is called dynamics scattering. The construction of a field effect liquid crystal display is similar to that of the dynamic scattering type with the exception that two thin polarizing optical filters are placed at the inside of each glass sheet. The liquid crystal material in the field effect cell is also of different type from employed in the dynamic scattering cell. The material used is twisted numeric type and actually twists the light passing through the cell when the latter is not energised.

Liquid crystal cells are of two types:

i. Transmittive type
ii. Reflective type

In the transmittive type cell, both glass sheets are transparent, so that light from a rear source is scattered in the forward direction when the cell is activate.

In reflective type cell has a reflecting surface on one side of glass sheets. The incident light on the front surface of the cell is dynamically scattered by an activated cell. Both types of cells appear quite bright when activated even under ambient light conditions.

The liquid crystals are light reflectors are transmitters and therefore they consume small amounts of energy (unlike light generators).

The seven segment display, the current is about 25micro Amps for dynamic scattering cells and 300micro amps for field effect cells. A typical voltage supply to dynamic scattering LCD is 30v peak to peak with 50 Hz

### 3.4.1.1 PIN DESCRIPTION

| 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- |

## 3.5 RS232 COMMUNICATION

### 3.5.1 Introduction

In communications, RS-232 is a standard for serial binary data interconnection between a DTE (Data terminal equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports.

### 3.5.2 SCHEMENTIC DESCRIPTION:

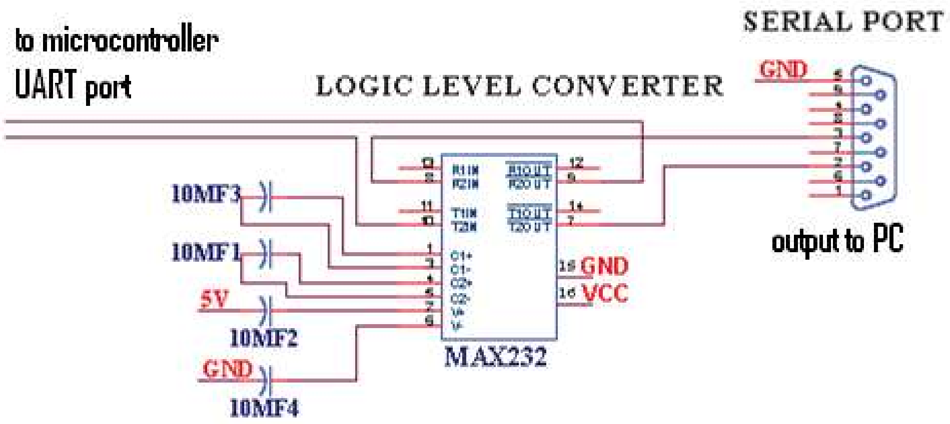



Fig no 3.7 RS232 PIN DIAGRAM

Scope of the Standard:

The Electronic Industries Alliance (EIA) standard RS-232-C [3] as of 1969 defines:

- Electrical signal characteristics such as voltage levels, signaling rate, timing and slew-rate of signals, voltage withstand level, short-circuit behavior, maximum stray capacitance and cable length
- Interface mechanical characteristics, pluggable connectors and pin identification
- Functions of each circuit in the interface connector
- Standard subsets of interface circuits for selected telecom applications

- The standard does not define such elements as character encoding (for example, ASCII, Baud rate or EBCDIC), or the framing of characters in the data stream (bits per character, start/stop bits, parity). The standard does not define protocols for error detection or algorithms for data compression.
- The standard does not define bit rates for transmission, although the standard says it is intended for bit rates lower than 20,000 bits per second. Many modern devices can exceed this speed (38,400 and 57,600 bit/s being common, and 115,200 and 230,400 bit/s making occasional appearances) while still using RS-232 compatible signal levels.
- Details of character format and transmission bit rate are controlled by the serial port hardware, often a single integrated circuit called a UART that converts data from parallel to serial form. A typical serial port includes specialized driver and receiver integrated circuits to convert between internal logic levels and RS-232 compatible signal levels.

### 3.5.3 CIRCUIT WORKING DESCRIPTION:

In this circuit the MAX 232 IC used as level logic converter. The MAX232 is a dual driver/receiver that includes a capacitive voltage generator to supply EIA 232 voltage levels from a single 5v supply. Each receiver converts EIA-232 to 5v TTL/CMOS levels. Each driver converts TLL/CMOS input levels into EIA-232 levels.

### Function Tables

EACH DRIVER

| INPUT TIN | OUTPUT TOUT |
|---|---|
| L | H |
| H | L |

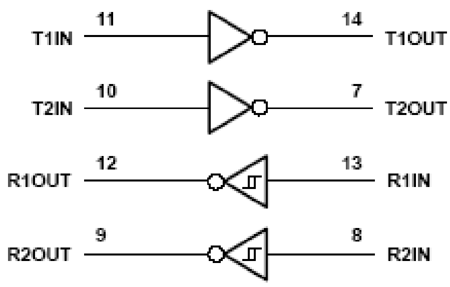
H = high level, L = low level

EACH RECEIVER

| INPUT RIN | OUTPUT ROUT |
|---|---|
| L | H |
| H | L |

H = high level, L = low level

**logic diagram (positive logic)**




In this circuit the microcontroller transmitter pin is connected in the MAX232 T2IN pin which converts input 5v TTL/CMOS level to RS232 level. Then T2OUT pin is connected to reviver pin of 9 pin D type serial connector which is directly connected to PC.

In PC the transmitting data is given to R2IN of MAX232 through transmitting pin of 9 pin D type connector which converts the RS232 level to 5v TTL/CMOS level. The R2OUT pin is connected to receiver pin of the microcontroller. Likewise the data is transmitted and received between the microcontroller and PC or other device vice versa.

## 3.5.4 PCB LAYOUT:

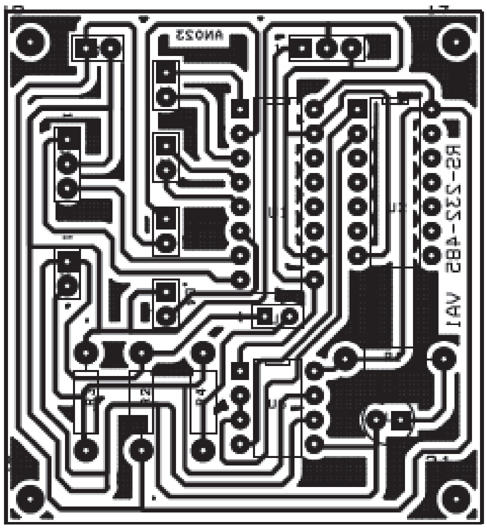


Fig no 3.8 RS232 PCB LAYOUT

## 3.6 DRIVER CIRCUIT

An H-Bridge is a circuit that can drive a current in either polarity and be controlled by Pulse Width Modulation (PWM).

Pulse Width Modulation is a means in controlling the duration of an electronic pulse. In motors try to imagine the brush as a water wheel and electrons as the flowing droplets of water. The voltage would be the water flowing over the wheel at a constant rate, the more water flowing the higher the voltage. Motors are rated at certain voltages and can be damaged if the voltage is applied to heavily or if it is dropped quickly to slow the motor down. Take the water wheel analogy and think of the water hitting it in pulses but at a constant flow. The longer the pulses the faster the wheel will turn, the shorter the pulses, the slower the water wheel will turn. Motors will last much longer and be more reliable if controlled through PWM.

### 3.6.1 FEATURES

- Light weight, small dimension
- Super driver capacity
- FWD protection
- Heavy load Heat sink
- Power selection switch
- 4 pull up resistor switch
- 2 DC motor/ 4 coil dual phrase stepper motor output
- Motor direction indication LED
- 4 standard mounting holes

### 3.6.2 SPECIFICATIONS

- Driver: L298
- Driver power supply: +5V~+46V
- Driver peak current: 2A
- Logic power output Vss: +5~+7V (internal supply +5V)
- Logic current: 0~36mA
- Controlling level: Low -0.3V~1.5V, high: 2.3V~Vss
- Enable signal level: Low -0.3V~1.5V, high: 2.3V~Vss
- Max drive power: 25W (Temperature 75 ℃)
- Working temperature: -25℃~+130℃
- Dimension: 60mm*54mm
- Driver weight: ~48g

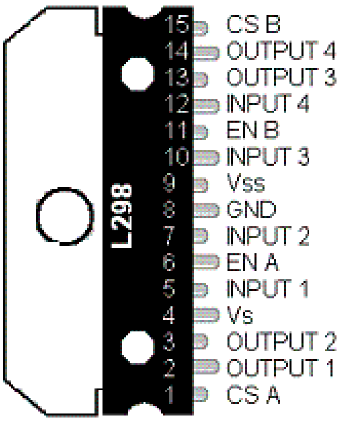



Fig no 3.9 PIN DIAGRAM L298N

**Pins:**

Out 1: Motor A lead out

Out 2: Motor A lead out

Out 3: Motor B lead out

Out 4: Mo (Can actually be from 5v-35v, just marked as 12v)

GND: Ground

5v: 5v input (unnecessary if your power source is 7v-35v, if the power source is 7v-35v then it can act as a 5v out)

En A: Enables PWM signal for Motor A (Please see the "Arduino Sketch Considerations" section)

In1: Enable Motor A

In2: Enable Motor A

In3: Enable Motor B

In4: Enable Motor B

En B: Enables PWM signal for Motor B (Please see the "Arduino Sketch Considerations" section)

Fig no 3.10 IC L298N

The advantage that the HN offers is that all the extra diodes typically necessary with a standard L298 circuit are already internally in the chip.

Varying DC Motor Speed

Pins 5 & 7 in the chip pin out above are inputs 1 & 2 respectively. These inputs take what is called a PWM input. The frequency of the PWM is dependent upon the motor. For our motor we'll use a 1 KHz input frequency

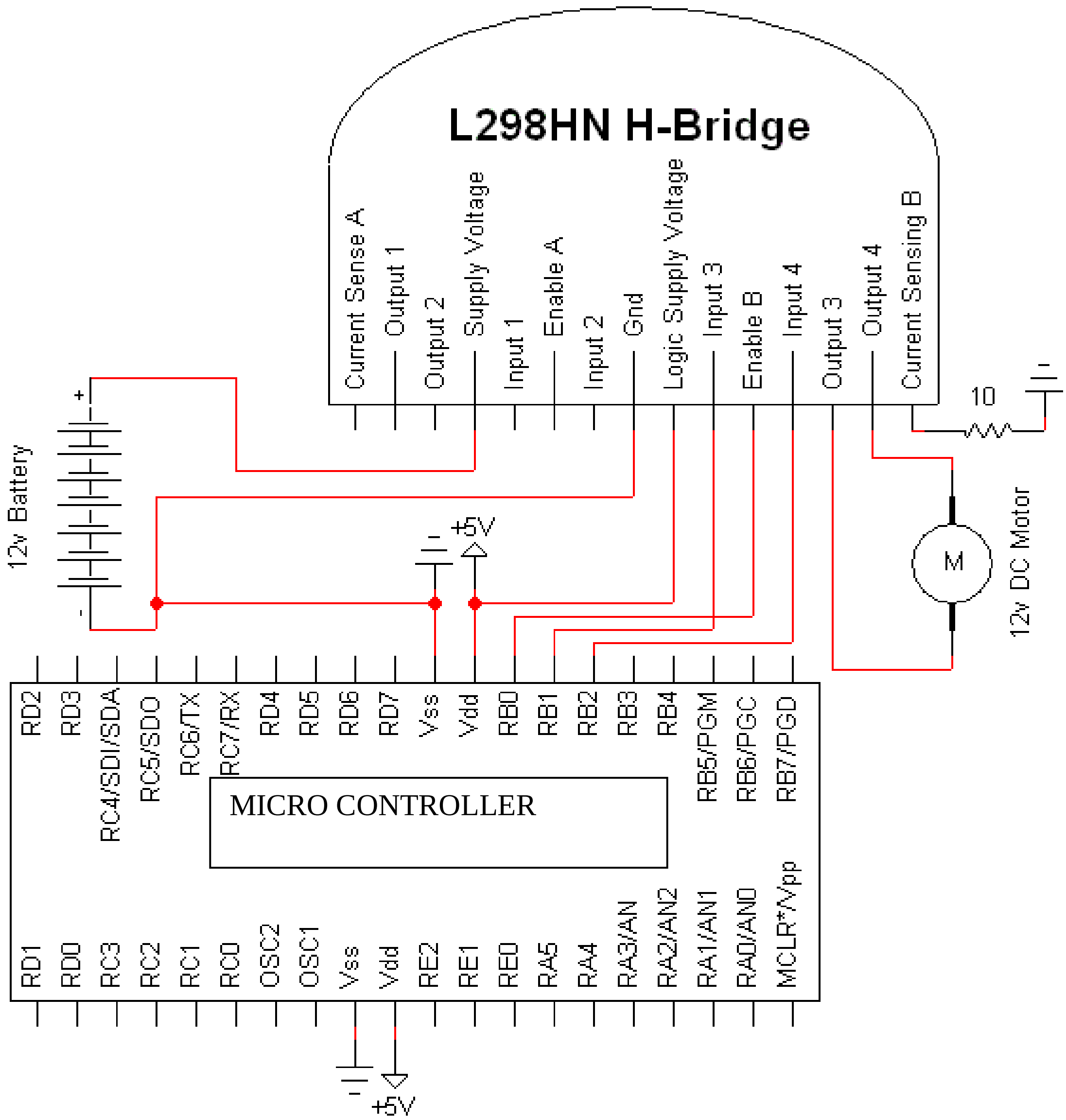



Fig no 3.11 INTERFACING OF L298 IC WITH CONTROLLER

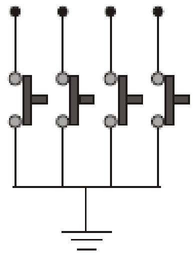
## 3.7 MATRIX KEYPAD

### 3.7.1 GENERAL EXPLANATION:

A group of keys in a single printed circuit board is call key pad. These key pads are classified into two types.

1) Key pad
2) Matrix keypad

#### 3.7.1.1 KEYPAD



In a key pad it has a one or more than one key are placed in a PCB. And all the keys are commonly grounded. This is the main difference to compared to matrix keypad. These key pads have maximum 8 numbers of keys. More than 8 keys are cannot be connected because it's not an efficient one. If we need more than 8 keys means, then only we can operate it a matrix keypad.

#### 3.7.1.2 MATRIX KEYPAD:

Above same keys are connected in a matrix principle it is called as a matrix key pad. This matrix key pad is working with the help of software. Otherwise it cannot work. This key pad is normally 3X3, 4X3, 4X4 like that.

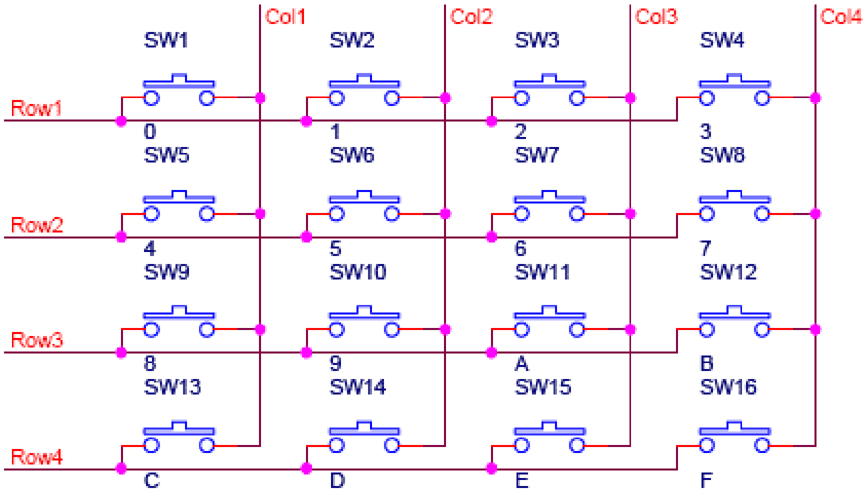


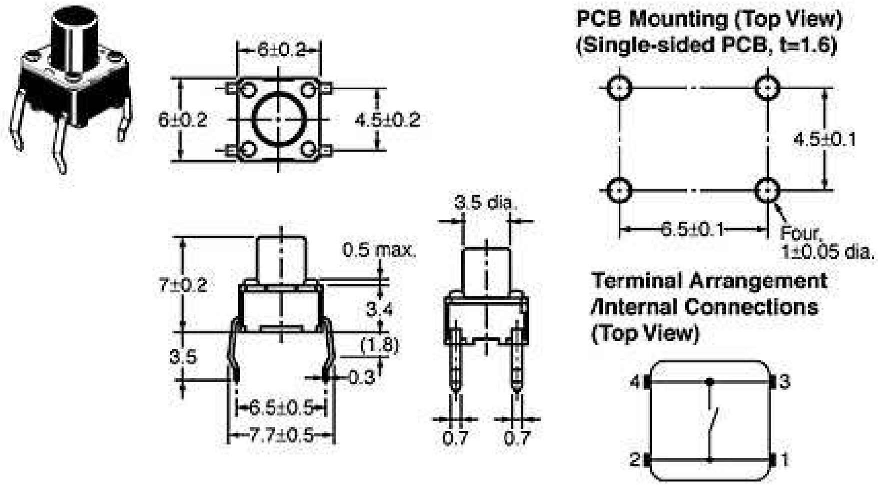

Fig no 3.12 MATRIX KEYPAD PIN DIAGRAM

### 3.7.2 SCHMATIC EXPLANATION:

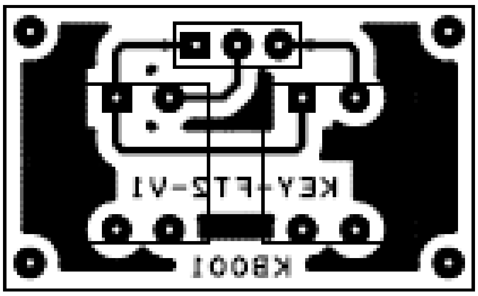
There are many methods depending on how you connect your keypad with your controller, but the basic logic is same. We make the columns as i/p and we drive the rows making them o/p, this whole procedure of reading the keyboard is called scanning. In order to detect which key is pressed from the matrix, we make row lines low one by one and read the columns. Let’s say we first make Row1 low, and then read the columns. If any of the key in row1 is pressed it will make the corresponding column as low i.e. if second key is pressed in Row1, then column2 will give low. So we come to know that key 2 of Row1 is pressed. This is how scanning is done. So to scan the keypad completely, we need to make rows low one by one and read the columns. If any of the buttons is pressed in a row, it will take the corresponding column to a

low state which tells us that a key is pressed in that row. If button 1 of a row is pressed then Column 1 will become low, if button 2 then column2 and so on...

### 3.7.3 KEY DIMENSSIONS:




### 3.7.4 PCB LAYOUT:



### 3.7.5 ITEM SPECIFICS

Place of Origin:

Zhejiang China (Mainland)

Model Number:

KFC

Size:

12mm x 12mm x H6mm

Contact:

Metal contact

Rating:

50 mA x 12 V DC

Contact resistance:

100M ohm max

Proof voltage:

250 V AC for 1 min

Insulation resistance:

100M ohm min/100 V DC

Temperature:

-30~+70 Degrees

Quantity:

1000pcs/lot

Weight:

900g/lot

### 3.7.6 APPLICATION:

Basically key pad is a number of buttons compiled in such a manner so that forms formation of numeral button and some other menus. Following is example configuration of key pad. Keypad needed to interaction with system, for example we make setting with set-point would a control feedback at the time of program still run. Actually every programmer has different way interaction to with system. Even for keypad in hardware every programmer can differ in. This thing is more because of different requirement.

# CHAPTER 4

## 4.1 MICROCONTROLLER CODING

```
#include <avr/io.h>
#include <avr/interrupt.h>
#include <inttypes.h>
#include <util/delay.h>
#include "ATM_LCD4.h"        //LCD header file
#include "ATM_Serial.h"      //serial header file
#include<avr/eeprom.h>



#define c1_on  PORTB|=0x10
#define c1_off PORTB&=~0x10

#define c2_on  PORTB|=0x20
#define c2_off PORTB&=~0x20

#define c3_on  PORTB|=0x40
#define c3_off PORTB&=~0x40

#define c4_on  PORTB|=0x80
#define c4_off PORTB&=~0x80

#define r1 (PIND&0X10)
#define r2 (PIND&0X20)
#define r3 (PIND&0X40)
```

```
#define r1_on  PORTB|=0x01
#define r1_off PORTB&=~0x01

#define r2_on  PORTB|=0x02
#define r2_off PORTB&=~0x02

#define limit_sw1 (PIND&0X04)
#define limit_sw2 (PIND&0X08)



unsigned char pass[5],i,a,set_pass[5]={4,5,6,7}, try_time,k,       flag;
unsigned char Blue_Buffer[10],bl,pass_flag,otp,set_pass1[5];
 unsigned int lfsr = 1502,otp1;
 unsigned char bit,test_char,pass_word_time;

/*ISR(USART1_RXC_vect )              // USART RX interrupt
{



 RF_ID_Buffer[RF]=UDR1;
 RF++;
 sei();

}*/

ISR(USART0_RXC_vect )                // USART RX interrupt
```

```
{

Blue_Buffer[bl]=UDR0;
if(Blue_Buffer[0]=='#')bl++;
sei();

}
int main()
{

cli();                          //clear interrupt
DDRD=0X02; //5 KEYS ARE INPUT  ,
 PORTD=0XFF;

DDRA=0xFF;
DDRC=0XFF;
PORTC=0x00;
DDRB=0XFF;
DDRB=0XF3;
sei();                          //set interrupt

Lcd4_Init();

Lcd4_Display(0x80," ATM SECURITY   ",16);
Lcd4_Display(0xc0," MANAGEMENT SYS ",16);
```

```
_delay_ms(200);

Lcd4_Command(0x01);
Serial0_Init(9600);
Receive0(1);
Serial1_Init(9600);
Receive1(0);
//keypad();
   r1_off;
   r2_on;
   while(limit_sw1);
   r1_off;
   r2_off;
while(1)

 /***********R2 make zero other make one***************************/
                                                       c1_on;c2_off;c3_on;c4_on;
      if(!r1)
{
while(!r1);
_delay_ms(1000);
a=2;
pass[i]=a;
eeprom_write_byte(i,pass[i]);
Lcd4_Write(0XC5+i,a+0x30);
i++;
```

```
}
    else if(!r2 )
   {
   while(!r2 );
   _delay_ms(1000);
   a=5;
   pass[i]=a;
   eeprom_write_byte(i,pass[i]);
   Lcd4_Write(0XC5+i,a+0x30);
   i++;
   }
     else if(!r3 )
     {
   while(!r3 );
   _delay_ms(1000);
   a=8;
   pass[i]=a;
   eeprom_write_byte(i,pass[i]);
   Lcd4_Write(0XC5+i,a+0x30);
   i++;
   }


/***********R3 make zero other make one**************************/
    c1_on;
    c2_on;
```

```
  c3_off;
  c4_on;
  if(!r1 )
  {
  _delay ms(1000);
  a=3;
  Lcd4_Write(0XC5+i,a+0x30);
  pass[i]=a;
  eeprom_write_byte(i,pass[i]);
  i++;
  }
else  if(!r2 )
  {
   while(!r2);
   _delay_ms(1000);
  a=6;
  pass[i]=a;
  eeprom_write_byte(i,pass[i]);
 Lcd4_Write(0xC5+i,a+0x30);
 i++;
 }
 else if(!r3)
 {
 while(!r3 );
 _delay_ms(1000);
 a=9;
```

```
 pass[i]=a;
 eeprom_write_byte(i,pass[i]);
 Lcd4_Write(0xC5+i,a+0x30);
 i++;
 }

 c1_on;
 c2_on;
 c3_on;
 c4_off;

 if(!r3)
{
 while(!r3);
 _delay_ms(1000);
 }

else if(!r2)
 {
  while(!r2);
  _delay_ms(1000);
  a=0;
  pass[i]=a;
  eeprom_write_byte(i,pass[i]);
  Lcd4_Write(0xC5+i,a+0x30);
  i++;
```

```
  }
Lcd4_Display(0xc0,"PASSWORD CORRECT",16);
  _delay_ms(1000);_delay_ms(1000);
  Lcd4_Display(0xc0,"                ",16);
  Lcd4_Command(0x01);
  flag=2;
  break;
  }
  if(flag==0)
  {
  try_time++;
  Lcd4_Display(0xc0," PASSWORD WORNG ",16);
  _delay_ms(1000);
  Lcd4_Display(0xc0,"    TRY AGAIN    ",16);
  _delay_ms(1000);
  Lcd4_Command(0x01);

  Lcd4_Display(0x80,"ENTER  UR PASSWRD",16);
  Lcd4_Display(0xc0,"                 ",16);

   }
  if(try_time>=3)
  {
  Serial1_Conout("#1",2);
  Serial1_Out(0x0d);
  Serial1_Out(0x0a);
```

```
  r1_on;
  r2_off;
  while(limit_sw2);
  r1_off;
  r2_off;
  break;
  }
  }
}
}
```

## 4.2 MATLAB CODING

```
clc;
clear all;
close all;
% warning off all;

%%
s=serial('com1');
    fopen(s);
 while(1)

    str=fscanf(s)
    if strcmp(str,'#1')
      input1 = videoinput('winvideo',2,'YUY2_320x240');
      set(input1,'ReturnedColorSpace', 'rgb');
      preview(input1);
      pause(5);
      testimg_color = getsnapshot(input1);
      imwrite(testimg_color ,'captured_image.jpg');
      figure,imshow( testimg_color);title('Captured image');
    end
 end
```

# CHAPTER 5

# 5. CONCLUSION

## 5.1 ADVANTAGES

- High speed operation
- Unauthorized person identified
- Buzzer is used to give the alarm signal for the unauthorized person
- Low power consumption
- High security.

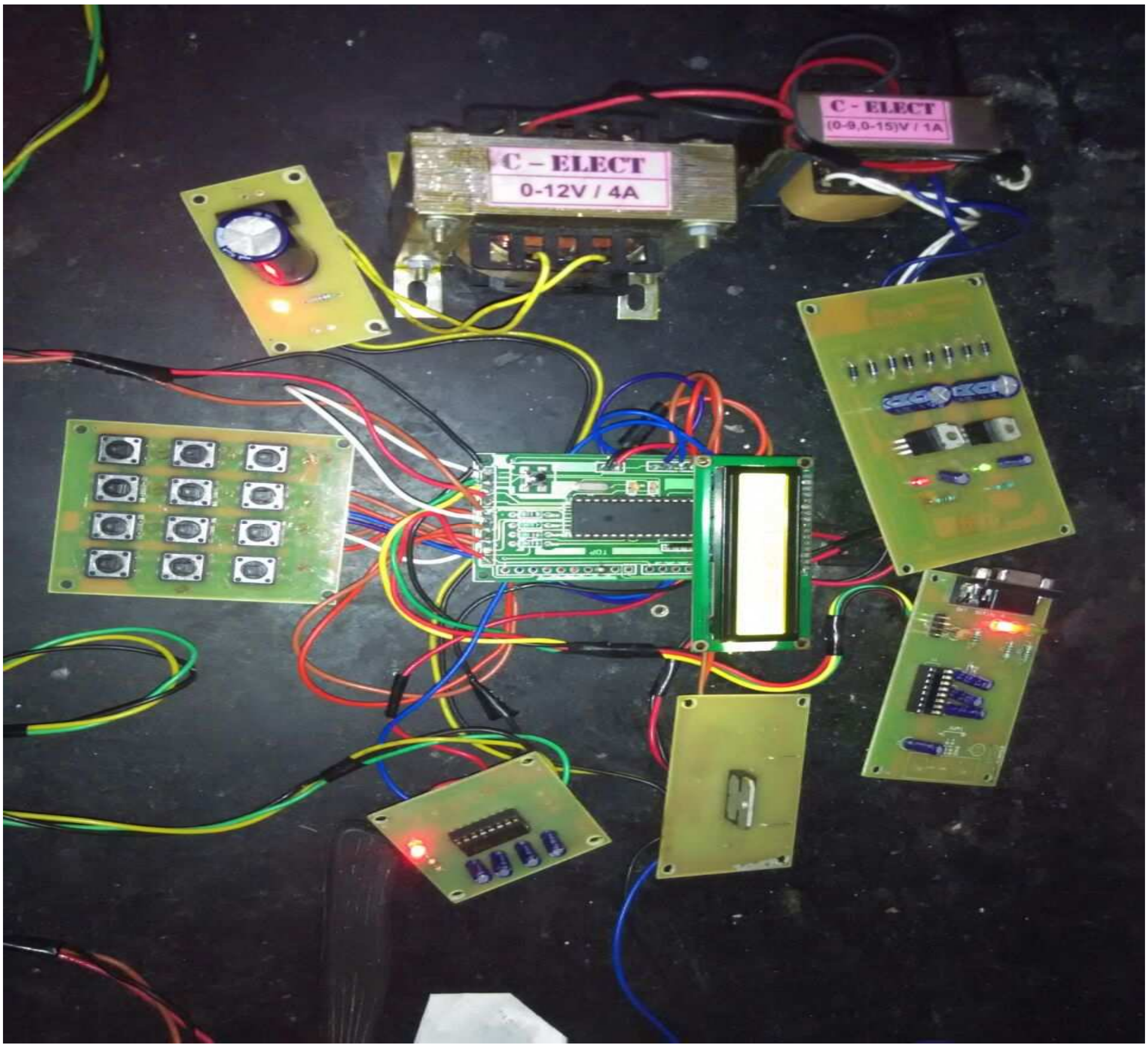
## 5.2 APPLICATIONS

- Customer amount is secured
- Easy to use for peoples
- Used in all ATM Centers
- Smart card based application

### 5.3 RESULT

This project named **ADVANCED ATM SECURITY SYSTEM** is successfully completed by us in a sophisticated manner. It was a good exercise for us in both theory and practical point of view. This can be effectively used for public. So we conclude our project by implementing this advanced security model at every ATM centers in future by reducing our present banks issues.

## 5.4 PHOTOGRAPHY:

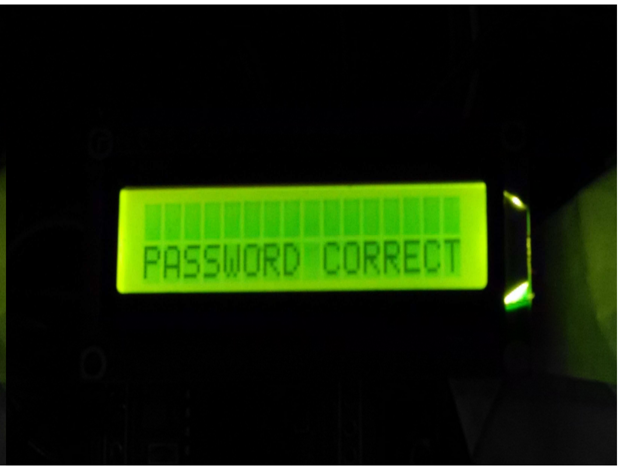



--PRESS 0 KEY--
FOR ENTER UR PW

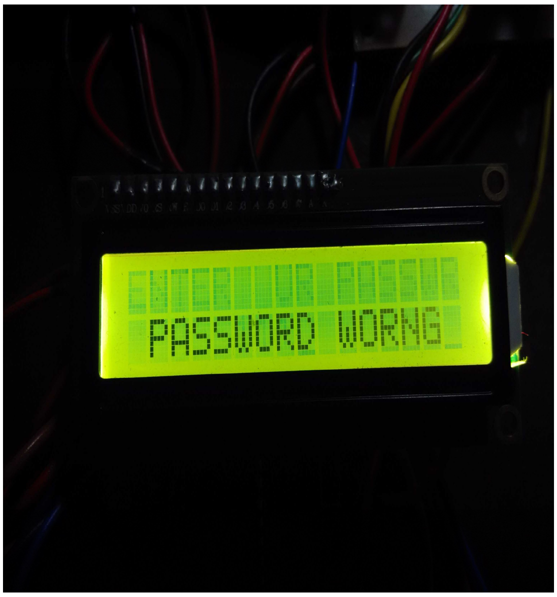

WAIT FOR OTP


ENTER UR PASSWR

IF AUTHORIZED:


IF UNAUTHORIZED:

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