WIRELESS E-PASSPORT USING SMART CARD TECHNOLOGY

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Abstract - The foremost aim of this project is to have access to all the details of a passport holder by using smart card technology. A smart card is given to the authorized person who will own all the details required for passport verification. This card will contain the name, UID number, Date of Birth, Nationality and all other required details. An IC used on this card which will be responsible for storing processing the information through modulation and demodulation on the RF signal which will be transmitted by the reader. The RFID reader will read the data present in the RFID passport and sends the data wirelessly by using RF transceiver. As soon as the card is kept on the card reader, the details of the person appear on the computer screen and verify it using the data present in the system and if it matches than the details of the passport holder is displayed. It reduces the burden of documentation which thereby reduces the time consumption. This makes the system centralized by increasing the security.

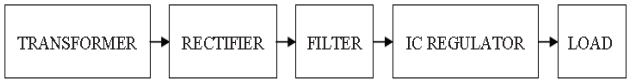
***Key Words*: wireless e-passport, RFID reader, authenticity of information, smart card reader, security, identification.**

1. INTRODUCTION

Smart card technology is being used in this proposed system. For this purpose, a smart card is provided to the authorized person. An IC is used in this system which will be responsible for storing the data and processing it by using modulation and demodulation of RF signal which is being transmitted by the reader. The card will contain all the details required for the passport verification. This proposed system simplifies the process by making use of a smart card which will contain all the details present in the passport such as name, date of birth, nationality, UID number, etc. When the person places the card into the card reader, the data is read and then verified using the data present in the system and then if the detail matches then it displays the details of the passport holder. This system thereby reduces the time consumption and since it uses a smart card reduces the use of documents which increases the security of the system and avoids forgery. In this system, the RFID tag will contain the details along with a unique identity number and the details of the person are fed into the computer. The RFID reader will read the data of the RFID passport and then transmits the data wirelessly with the help of GSM module.

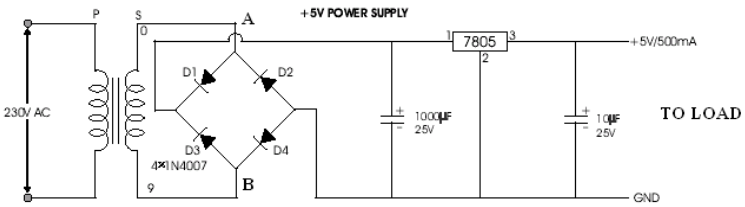
The various components present in this project are as listed below:

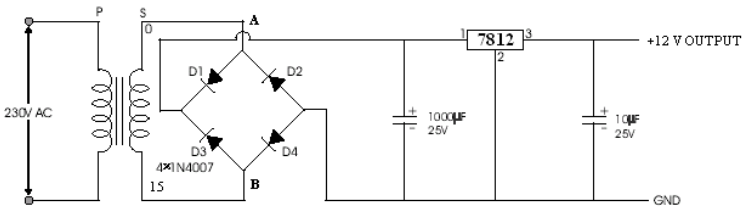
2. **Power Supply**:



Typically a 220V AC RMS voltage is connected to a transformer to step the AC voltage down to the level of the desired DC output. A full wave rectified voltage is then provided by a diode rectifier which is initially filtered by a simple capacitor filter to produce a DC voltage. There are some ripples in the resulting DC voltage. A regulator IC will remove this ripples and will retain the same DC value even if there are variations in the DC voltage.

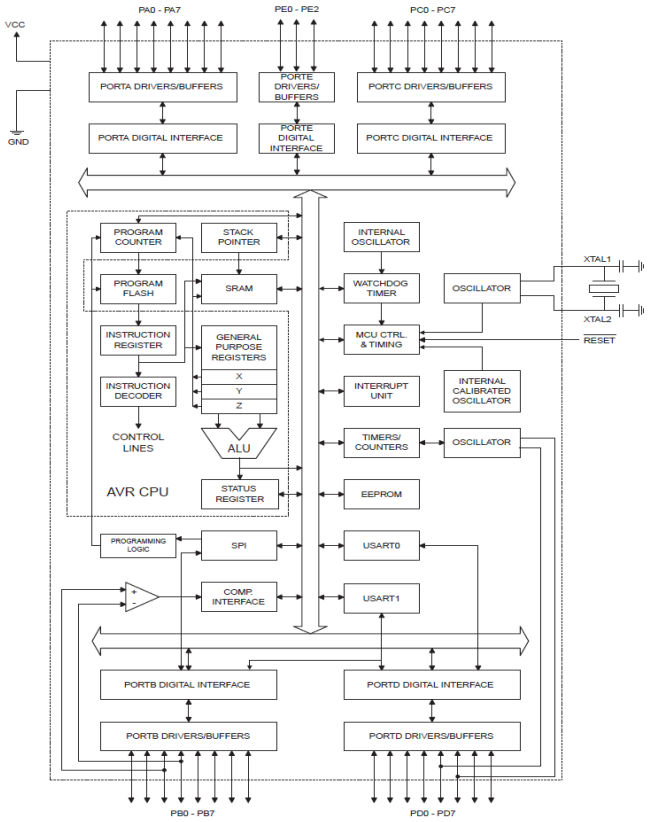
SCHEMATIC DIAGRAM:





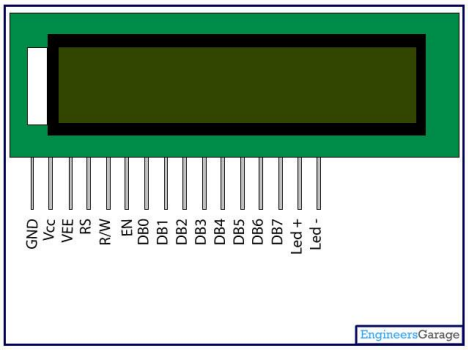
3. ATMEGA 162V:

The ATMEGA 162V is an 8-bit microcontroller having low power CMOS technology based on the AVR RISC architecture. The ATMEGA 162V approaches throughputs of 1 MIPS per MHz by executing powerful instructions in a single clock cycle allowing the system designer to optimize power consumption versus processing speed. The ATMEGA 162V has the following features: 16 KB of in-programmable flash with read-while-write capabilities,512 bytes EEPROM,1 KB SRAM, external memory interface,35 general purposes I/O lines,32 general purpose registers, a JTAG interface for on-chip debugging support, boundary scan and programming. The AVR core has a combination of a rich set of instructions and 32-bit general purpose working registers.



4. LCD

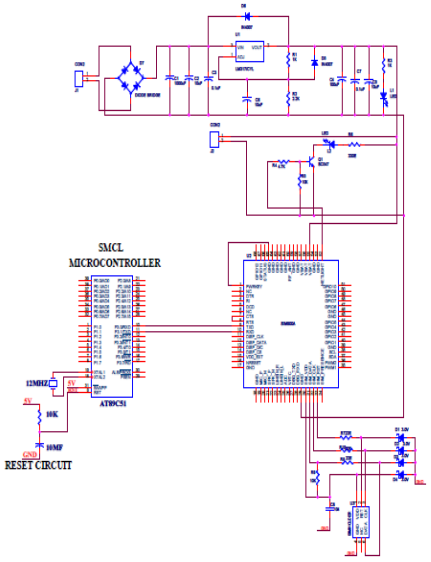
A 16x2 LCD display is used in this project which is basically an electronic display module used in a variety of applications. The 16x2 LCD has the ability to display 16 characters and has such 2 lines. Each character is displayed in the form of the 5x7 pixel matrix in this LCD.



	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-

5. GSM Module:



This is a plug and plays GSM modem which is used to send SMS, initiate and receive calls and to perform different GSM operations by controlling it via simple AT commands given by using microcontrollers and computers. SIM900 module is widely used for all its operations which are used along with a standard RS232 interface which can be used to easily interface the modem to microcontrollers and computers.

6. RFID reader and RFID tag:

A RFID reader is a device that gives the connection between the tag data and the enterprise system software that requires the information. It is commonly known as an interrogator. The reader interacts with tags that are within its field of operation, performing any number of tasks including filtering (searching for tags that meet certain criteria), simple continuous inventorying, writing (or encoding) to selected tags, etc.

A RFID tag is made up of an integrated circuit (called an IC or chip) attached to an antenna which has been printed, etched, stamped or vapor-deposited onto a mount which is often a paper substrate or Poly Ethylene Terephthalate (PET). The combo of chip and antenna, known as an inlay, is then converted or sandwiched between a printed label and its adhesive backing or inserted into a more durable structure.

7. CONCLUSIONS:

Wireless e-passport system uses smart card technology which gives a clear vision about the benefits of using smart card technology as this system avoids forgery and thus increases the security. This decreases the burden of documentation and thereby reduces the time consumption. The use of smart card technology makes the system centralized and thus improves the security. The security of the system can be further be enhanced by adding biometric information such as palm scan, fingerprints, iris scan, digital signature and other active validation in the passport system. This project finally look as shown below:

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