

# Automation of Petrol Bunk using Biotelemetry System and Petro Card

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**Abstract-** Aiming at causing frequency traffic accidents by the drunk and driving and black selling of petrol by the serviceman. The paper puts forward an automation of petrol bunk as a smart solution to this phenomenon and designing of this automation system based on ATMEGA 8A. The system hardware modules and software system are elaborated in detailed. At last through the experiment, it verifies that this system has reached requirement.

**Keywords:** ATMEGA 8A microcontroller, Alcohol sensor, Fingerprint sensor, RFID, RFID Tag.

## I. INTRODUCTION

In current days fuel stations are operated manually. These fuel pumps are time consuming and require more manpower. To place fuel stations in distant area it is very costly to provide excellent facility to the consumers all these problem are sorted out by the use of unmanned petrol pump which requires less time to operate and it is effective and can be installed anywhere the customer self-going to avail the services the payment is done by electronic clearing system. In our system the RFID will be provided to the user. Biotelemetry provided by the fuel station which will help the petrol company to create authentication for user also the distribution of the fuel is not possible until it gets verified by the database. In short we provide secure system for fuel distribution. The advancement of this project can help industry financially.

Nowadays road accidents is a major problem all over the world. The latest record of National Crime Records Bureau (NCRB) says that 40 people under the age of 25 died in road accidents all around the world. The World Health Organization (WHO) reveals a statistics that 80,000 people are killed on Indian roads due to drunk and driving. This system can detect driver's alcohol concentration gas of breath smelled. Display test results and control relay movements according compare between the driver's alcohol concentration gas with the reference value. When Blood alcohol concentration is detected reaches 20g/100L, then the user unable to fill the fuel.

## II. EXISTING SYSTEM

At present the petrol bunks are running with man power and dispensing fuel paying cash needs service man support. To overcome this Bhavishya Credit Co-operative Society, Ltd has introduced „Bhavishya Petro Cards“, a scheme where a card holder can buy petrol from any petrol bunk in India, without paying.

There are three scheme made available for customer, Plan A-Rs.11,110, Plan B-Rs.21,110 and Plan C-

Rs.61,110. After choosing any one plan, customer needs to pay the amount and his Bhavishya Petro Card will be active. At every time the swiped amount will be debited from Bhavishya user account. The user can avail this service at the particular one year period. Afterwards the user will renew his Bhavishya account for avail this process again.



Fig.2. Existing system of Petrol Bunk.

## III. PROPOSED SYSTEM

The drawbacks in Bhavishya Petro Card Scheme is that card, exist only for a period of one year. The card holder has to Renewal his Petro Card, by paying the amount every year. It is a difficult task to the user to perform this type of task again and again. To overcome this problem Bhavishya Petro Card Scheme is replaced by Merged Petro Card. The Merged Card is a combination of licence and debit card. Hence the petro card contains debit card the user can get access his money directly from his bank account. Then this card also contains licence with in it. To make all the drivers become a licence holders. Nowadays most of the people not having serious knowledge about the traffic rules. They never follows the defined government rules.

Especially in drunk and driving and driving the vehicles without having licence. These are all the things make

miscontribution with the traffic rules to cause endangered accidents. To reduce this type of misbehaviourance in traffic this proposed system uses merged petro card. The Merged petro card not only holds the licence and debit card. It also holds information about the user data.

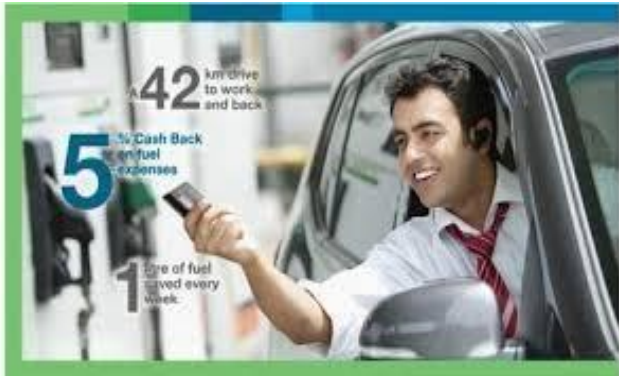


Fig.3. Proposed System of Petrol Bunk.

#### IV. METHODOLOGY

It uses RFID technology for identifying individual user details in that card. The information present in a RFID based Petro Card is read by the RFID reader. This paper uses Biotelemetry system to authenticate the individual user with their Petro Card. The Biotelemetry here used as a fingerprint sensor. The Drunk and Drive Accidents are reduced by using the alcohol sensor in Petrol bunks. The alcohol sensor senses the alcohol concentration in the blood by breathing. It involves three steps. The First step is to authenticate the licence holder by using biotelemetry identification.

In this step bio telemetry system checks whether finger print is match with the petro card or not. If it is matched then the red colour light switched into yellow colour light. Else remains in red colour. The Second step is to identify the driver is drunk or not by using the alcohol sensor. If drunk then then the yellow colour light is change back to red colour else remains in yellow colour.

The Third step is paying the bill using Petro Card for filling the fuel. This is the final step in this yellow colour light is changed into green color for a few seconds. Then it is automatically changed into red colour for the new user.

#### V. EXPERIMENTAL SETUP

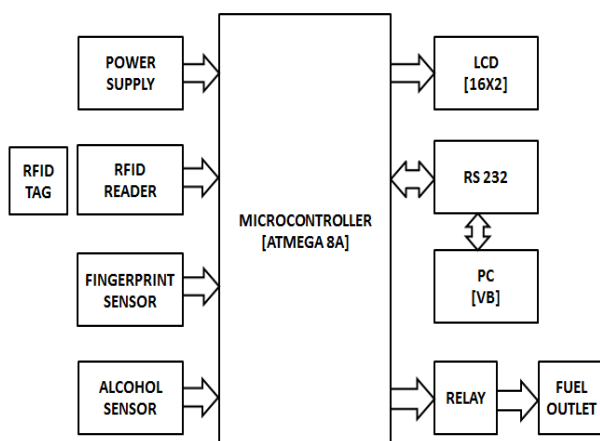


Fig.5.1. Block Diagram

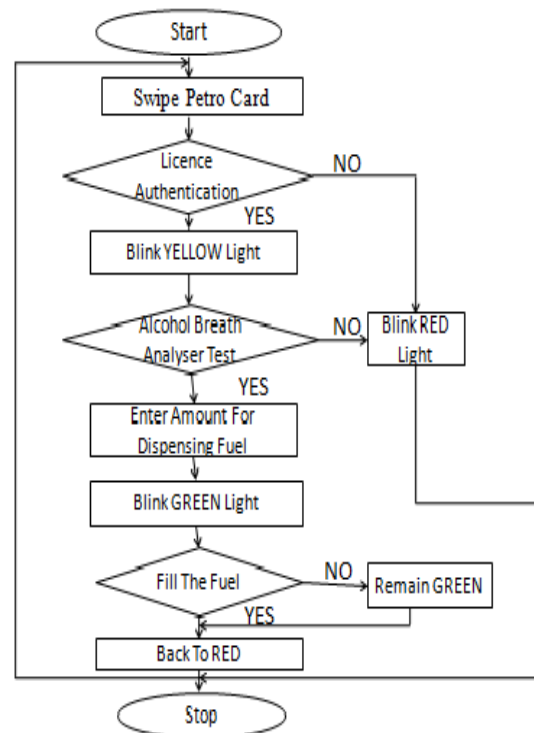


Fig.5.2. Flow Chart

#### A. ATMEGA 8A MICROCONTROLLER

In this paper ATMEGA 8A controller is used for the loading program. AVR family consists of various versions and particularly 8A selected because of its high end performance with low input. In this port B is absent and it consist of 32\*8 general purpose working register. The operation performed by this microcontroller is fully static. We can write/erase cycles of about 10,000 flash or 1,00,000 flash by using EEPROM.

It consist of real time counter with separate oscillator.

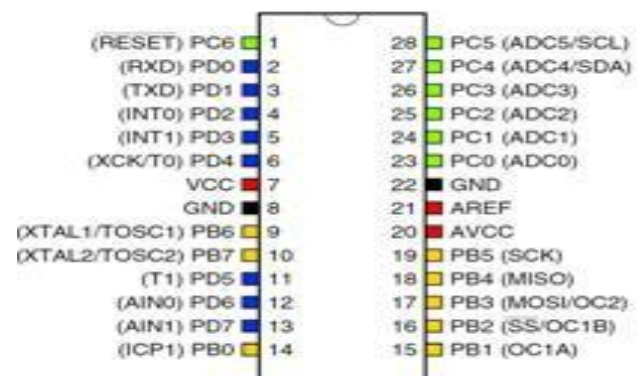


Fig.5.A. Pin configuration of ATMEGA 8A

The operating voltage of the ATMEGA is 2.2-5.5 volts. where the consuming input is low compared to other. It is performing with advanced RISC architecture with non-volatile memory segments. It allows 130 instructions which is normally high compared to other and it comprises of 16 bit address with 8 bit data. The data retention of the ATMEGA 8A is 20 years at 85<sup>0</sup> C and 100 years at

25 C. The peripheral features includes two 8-bit Timer/Counters with Separate pre scalar, one Compare Mode One 16-bit Timer/Counter with Separate Pre scalar, Compare Mode, and Capture Mode. One of the special features of controller is Power-on Reset and Programmable Brown-out detection with Internally Calibrated RC Oscillator. It can be varied with five sleep modes like Idle, Standby.

### B. FINGERPRINT SENSOR

A fingerprint is an impression of the friction ridges on all parts of the finger. The term fingerprint normally refers to impressions transferred from the pad on the last joint of fingers and thumbs, through fingerprint cards also typically record portions of lower joint areas of the fingers, which are also used to make identifications. Fingerprint identification sometimes referred to as dactyloscopy or palm print identification is the process of comparing questioned and known friction skin ridge impressions from fingers or palms or even toes to determine if the impressions are from the same finger or palm.

Fingerprint image acquisition is considered the most critical step of an automated fingerprint authentication system, as it determines the final fingerprint image quality, which has drastic effects on the overall system performance. Biometrics consists of automated methods of recognizing a person based on unique physical characteristics. Each type of biometric system, while different in application, contains at least one similarity. The biometric must be based upon a distinguishable human attribute such as a person's fingerprint, iris, voice pattern or even facial pattern.

### C. RADIO-FREQUENCY IDENTIFICATION

Radio-frequency identification (RFID) is a technology that uses radio waves to transfer data from an electronic tag, called RFID tag or label, attached to an object, through a reader for the purpose of identifying and tracking the object. Some RFID tags can be read from several meters away and beyond the line of sight of the reader. The application of bulk reading enables an almost-parallel reading of tags.

RFID is a superior and more efficient way of identifying objects than manual system or use of bar code systems that have been in use since the 1970s. Furthermore, passive RFID tags (those without a battery) can be read if passed within close enough proximity to an RFID reader. RFID can be used in many applications. A tag can be affixed to any object and used to track and manage inventory, assets, people, etc. For example, it can be affixed to cars, computer equipment, books, mobile phones, etc. The Healthcare industry has used RFID to reduce counting, looking for things and auditing items.

### D. ALCOHOL SENSOR

This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple, all it needs is one resistor. A simple interface could be a 03.3V ADC.

The good news is that if you know how much alcohol is in your breath, there is a straightforward formula used to alcohol content (BAC). Alcohol content in a volume of breath or blood is expressed as mg/L (milligrams per liter). content is 10g/L or 10,000mg/L. Since this level would almost certainly be fatal, let's scale this down from "dead" is 1000mg/L.

It turns out that there is a standard conversion from breath alcohol content to commercial breathalyzers. Breath and blood alcohol content differ by a factor of 2100; that is, for every mg of alcohol are 2100mg of alcohol in the blood. So, a person with BAC of 0.1% has 1000mg/L of alcohol in their blood and alcohol in their breath. The final formula for calculating BAC from the alcohol measured in the breath is: % BAC = breath mg/L \* 0.21.

It uses the MQ3 type sensor. Basically, there is a heater which you power by connecting to draws about 150mA of current. It would not power the heater directly from an Arduino board and *certainly* not Arduino voltage regulator can handle 800mA need to consider the power dissipation capability of that voltage think it's best to power the heater from an external source like a regulated 5V power supply or a 7805 voltage regulator.

The other part of the circuit is essentially a variable resistor inside the sensor. The resistance across the pin and on how much alcohol is in the air is measured. The more alcohol, the lower the resistance. It measure alcohol this resistance. Instead of measuring the resistance directly. It measure the voltage level at the point between the the sensor and load resistor form a voltage divider, and the lower the sensor resistance. The higher voltage reading analog input pin is a good way to measure the voltage and gives a reading between 0 and 1023.

It uses a 10K ohm load resistor in series with the sensor resistor. Says to use a 200K ohm resistor, but anyone which is used this sensor knows that this constrains the measured voltage recommend a 10K ohm resistor.

### E. LCD DISPLAY

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other.

Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other. In this paper LCD is used to display whether the driver is drunk or not. With the 16x2 standard display and it also displays the authentication details of driver.

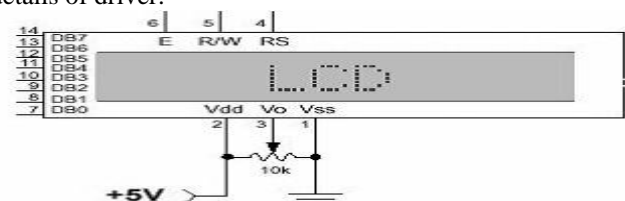


Fig.5.E.LCD Display

## VI. CONCLUSION

If there is a rules makers there is a rules breakers. To avoid this the way of following the rules should be criticized. Hence our paper uses petro card system, the implementation of this system in Petrol bunk would be very helpful to make all the drivers to have a licence, By implementing alcohol sensor as in this paper. In our country there is 75% of accidents are due to the drunk and driving. This process makes our country to become a accident reduced nation and our people to know the importance of having a license.

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