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Development of Low Cost Fuel Monitoring System for Automobiles

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ABSTRACT: Till date there are projects regarding the fuel theft detection and alarming. But we are not sure whether the fuel is filled at proper quantity as displayed at the petrol bulk itself. To not run the risk of being cheated at the bulk, we measure the fuel injected into the tank while filling itself. Hence we can verify whether both the readings of fuel quantity are the same. The microcontroller acts as the main heart or Central Processing Unit of the system calculating the fuel quantity and it also displays it.

KEYWORDS: Flow Meter, Arduino, LCD display.

I. INTRODUCTION

All internal combustion engines running on liquid fuel have to be very fuel efficient from economic point of view. All these engines are equipped with most advanced automated fuel indication devices. These are system built devices. There should be some provision at the user level to know the quantity of fuel at all times since the safety and security of fuel is of utmost importance. To cater the needs of fuel savings, the flow meter is used to ensure a cost-effective fuel monitoring system.

This system consists of a fuel quantity reader and a fuel-level monitoring system which will ensure efficient use of fuel, minimize operating cost, and help realize maximum profit. This system is user friendly, easily to install and low cost.

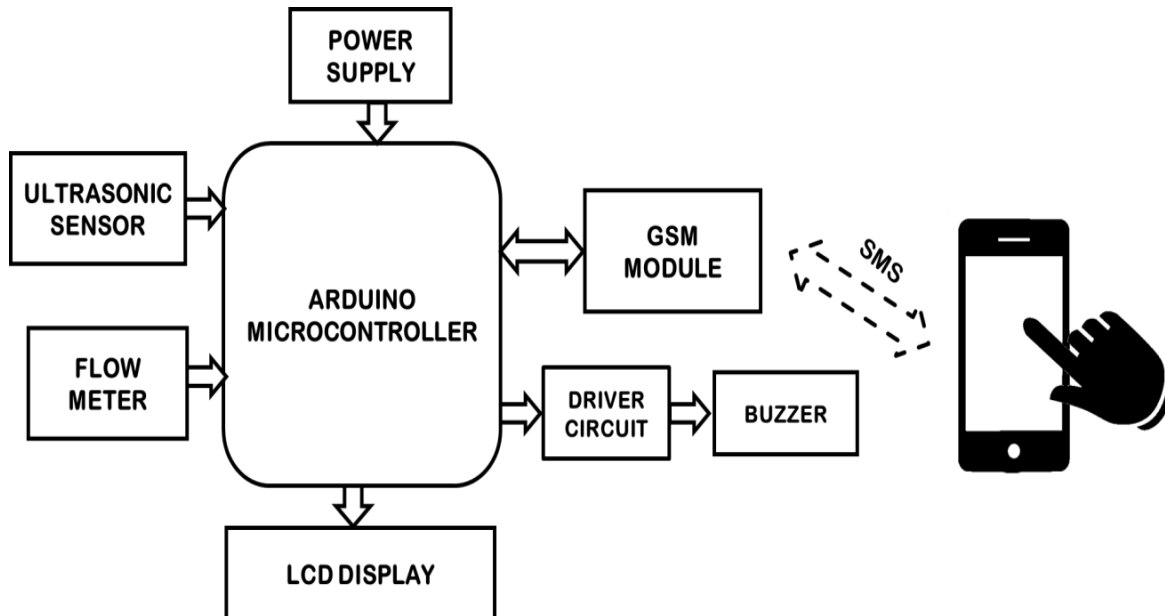
II. SYSTEM MODEL

The system model is actually a device that fits the fuel tank of automobiles. This model can be applied for all types of vehicles that run on fuel. The following are the divisions of the operations.

- Fuel Measurement.
- Quantity Displayed.
- Sensor Sensing.
- SMS sent.



III. BLOCK DIAGRAM



IV. FUEL MONIETRING AND HARDWARES

This is a different type of fuel monitoring system which involves the measurement of the fuel being injected to the fuel tank. This process requires the following key hardware in the system.

- Arduino
- GSM Module
- LCD Display
- Flow Meter

V. ARDUINO AND GSM

The arduino chip or board acts as the brain of this system. It controls all the actions of the entire system. It reads the reading in the flow meter and displays it in the LCD display. And it also controls the functions of the GSM module which has to be operated when a fall in fuel level in the tank is detected. It commands the GSM to send SMS to the owner of the vehicle once the fuel level is found to be low. It is also helpful in the cases when the fuel is being stolen.

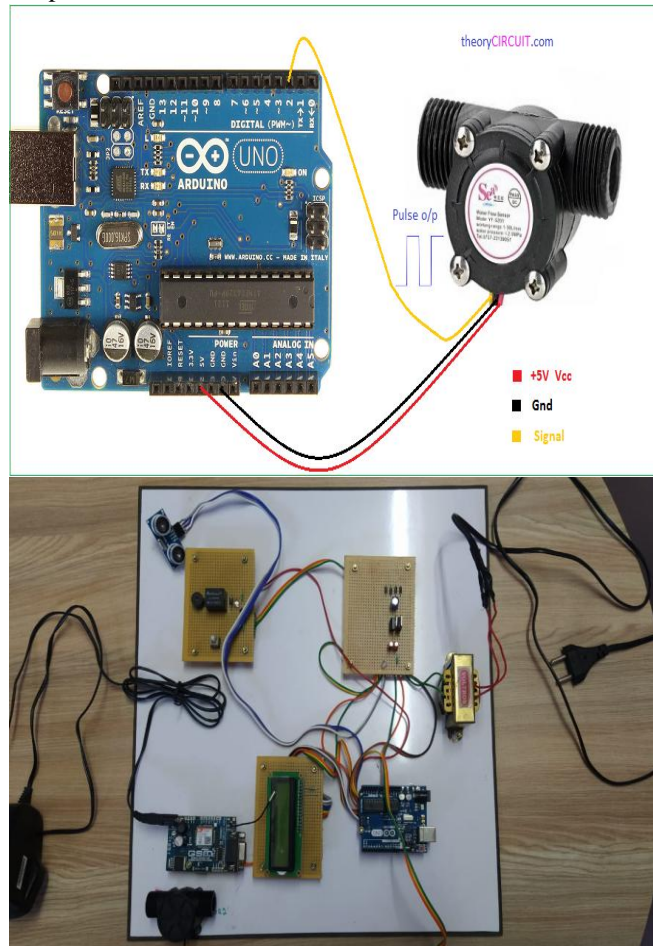
VI. FLOW METER AND OPERATION

The flow meter is the main component of this system. It measures the quantity of the fuel being added at the petrol bulks. Thus, it is the first and foremost operation of the device. The injected fuel flows through the flow meter and by the method of positive displacement measurement, the quantity of fuel is measured. This measured pulse is sent as electrical quantity to the arduino microcontroller and from there it is converted into digital signal and is displayed in the LCD display. Another function is the detection of fuel level. This function is mainly carried out through the ultrasonic sensor, which senses the level of fuel and triggers the arduino which in turn sends an SMS with the help of GSM module that is interfaced in it. Message is sent to the mobile number which is being programmed in the arduino. SMS is sent only when the fuel is only 4 cm deep.



VII. RESULT AND DISCUSSION

Thus the functioning of the above mentioned system is verified and found to be working. Fabrication of the device should be done to be made into a compact device.



VIII. CONCLUSION

Due to rising prices of fuel the need for tracking fuel theft is necessary. Whenever there is intrusion or tampering of fuel and fuel tank the smart system is activated giving the owner the precise indication of vehicle and its fuel content. The basic purpose of this work which is security that is provided by the GSM module functioning. In this research work an advance and cost effective approach for fuel security has been proposed. It can be installed in a small space which cannot be easily accessed. The distinct feature of this system is, it continuously sends the text message to the owner until the owner acknowledges in return. Even though many systems are in use but most of them are either expensive, unreliable, complicated in design occupying more space and ineffective for long distance signal transmission. Further improvement can be done by making use of advanced sensors, SMS, Arduino microcontrollers to make it full proof.

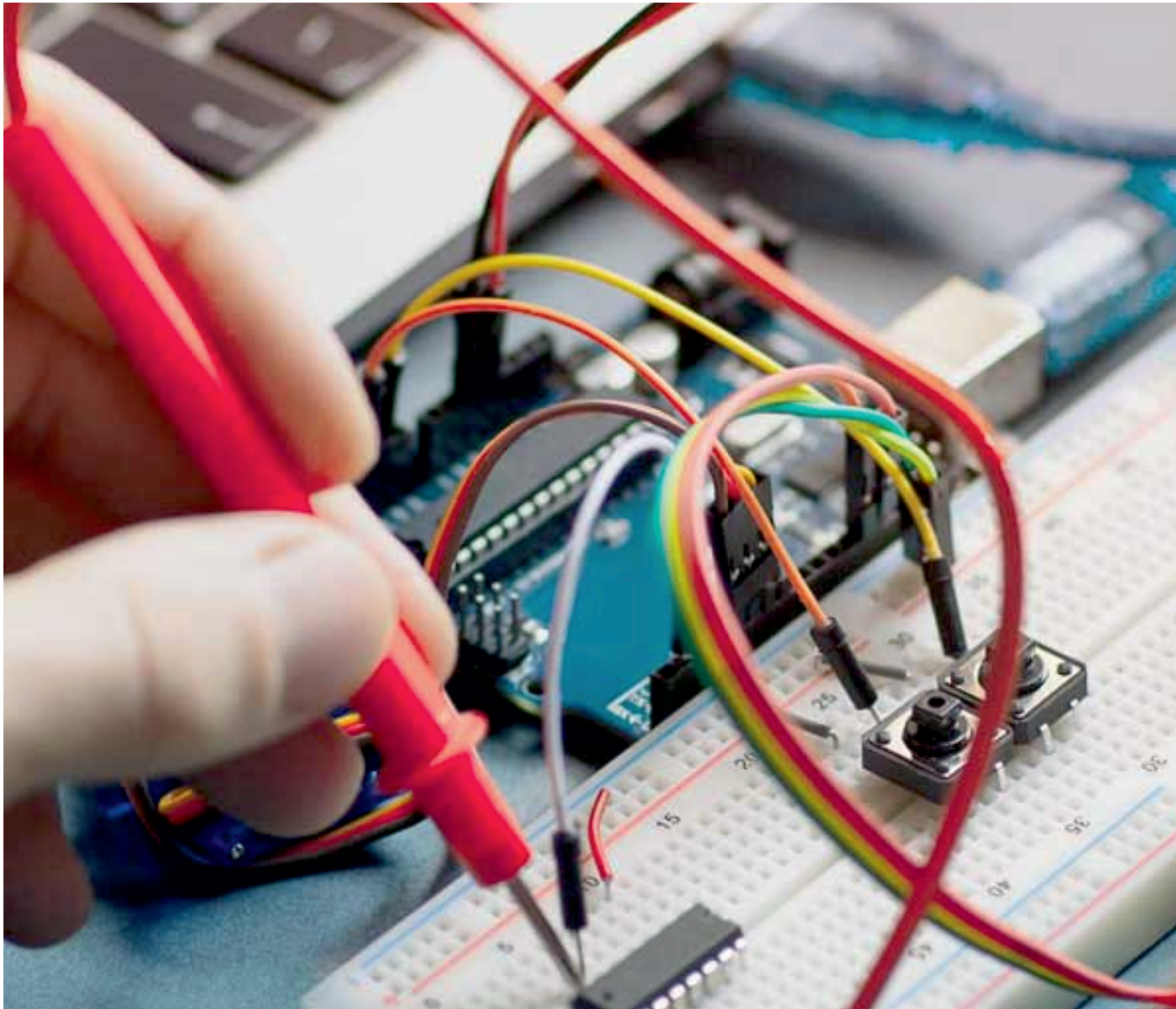
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