A Review: GSM Based Vehicle Fuel Monitoring and Theft Detection System with SMS Indication

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Abstract— Today's world need digital techniques for measurement of any quantity conventional fuel meter are Analog so that we trying to make it digitized to show the fuel value digitally. In our project we show the amount of fuel Present in fuel tank digitally i.e. 1lits, 1.5lits, 2lits etc. Also fuel theft is measure problem in all over world. In our project if fuel gets theft then text message will send to owner of bike also buzzer makes noise so that owner of bike get aware. In traditional vehicle system such kind of system not implemented like display fuel availability digitally & fuel Theft of bike can be avoided

Keywords: *AVR, SIM900, ADC, Fuel tank .*

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1. INTRODUCTION (*HEADING 1*)

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. The safety and security of fuel is of utmost importance. In the recent years, escalating oil demands and costs of fuel are increasing. This indirectly increases the overheads of many businesses and those with large vehicle fleets.

Global oil supply and demand forecasts for 2015 have changed significantly recently, but these changes have largely cancelled each other out: the outlook is still one of a market roughly in balance. However, it is at times of rapid market change that forecasting becomes most difficult. In July of 2014, before crude prices collapsed, forecasts from the International Energy Agency, US Energy Information Administration and OPEC suggested that world oil demand would rise by about 1.35 million b/d in 2015 and that the global supply/demand balance would be very slightly positive.

To cater the needs of fuel savings due to a one of the few above mentioned problems, the SIM 900 GSM module is used over a Global System for Mobile Communications (GSM) network to provide a practical and cost-effective remote fuel-level monitoring system. A study conducted by Reza et al. on automated water level sensing and controlling used microcontrollers. However this was implemented locally. Later work was carried out using embedded control based system for remote monitoring of fuel level made use of third party monitoring software for detection of fuel theft and vehicle position. The system consisted of an ultrasonic fuel Sensor, numeric lock, and third party monitoring software for providing indication about fuel theft. Work done by authors are large and a few of them are mentioned here. This work will help to provide periodic details about fuel level, vehicle position and will also help to track fuel theft. The current research has been designed to work with GSM technology. This technology receives the coordinates from the satellites along with other critical information. It generates a message, whenever an intruder tries to gain unauthorized access of the vehicle. GSM being one of the most popular and used mean of mobile communication makes it viable and unique in a way that many of the systems / applications designed can be made to work with GSM because it is a worldwide used, implemented and followed standards.

The system is microcontroller based that consists of a global system for mobile communication (GSM). This project uses GSM modem. GSM modem, provided.

With a SIM card uses the same communication process as we are using in regular phone. The work includes the design and

International Journal on Recent and Innovation Trends in Computing and Communication
Volume: 5 Issue: 1 (*Special Issue*)

ISSN: 2321-8169
06 - 09

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construction of a remote fuel-level sensor followed by remote monitoring of the fuel level. Monitoring is done by sending messages from a compatible mobile phone. Messages are sent to the owner at regular interval of time. One more distinguishing feature of this research is the locking of vehicle using remote password. Siren can also be enabled during intrusion.

This fuel-level monitoring system 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 ARCHITECTUR

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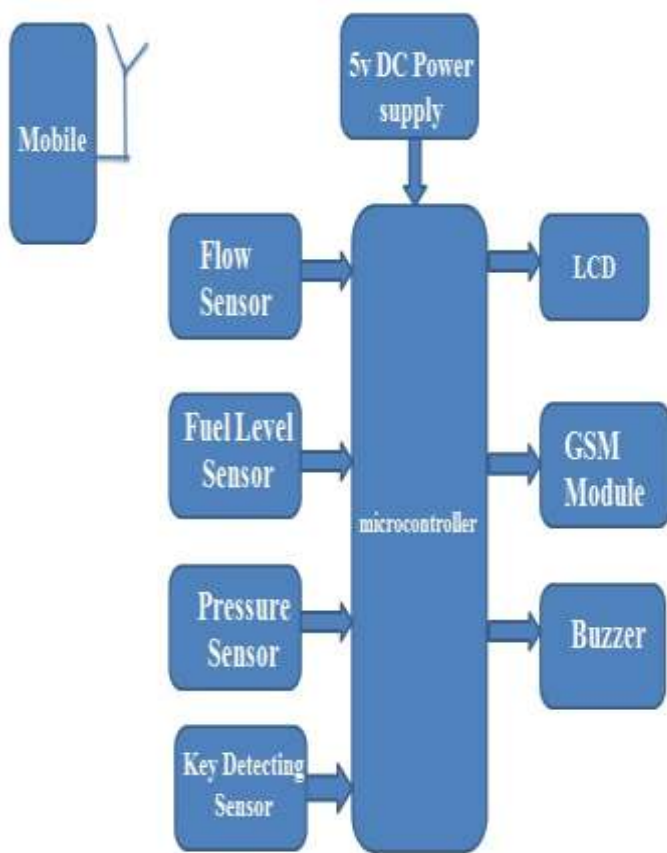
Flow Sensor

Measure liquid/water flow for your solar, water conservation systems, storage tanks, water recycling home applications, irrigation systems and much more. The sensors are solidly constructed and provide a digital pulse each time an amount of water

GSM Module

This is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and which can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs. Externally, it looks like a big package (0.94 inches x 0.94 inches x 0.12 inches) with L-shaped contacts on four sides so that they can be soldered both on the side and at the bottom. Internally, the module is managed by an AMR926EJ-S processor, which controls phone communication, data communication (through an integrated TCP/IP stack), and (through an UART and a TTL serial interface) the communication with the circuit interfaced with the cell phone itself. The processor is also in charge of a SIM card (3 or 1,8 V) which needs to be attached to the outer wall of the module The module is supplied with continuous energy (between 3.4 and 4.5 V) and absorbs a maximum of 0.8 A during transmission.

ATmega16 Microcontroller

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. AVR is a modified Harvard architecture 8 bit RISC single chip microcontroller which was developed by Atmel in 1996. AT mega 16 is high performance low power Atmel AVR 8bit microcontroller with 8kb of in system self programmable memory. There are 131 powerful instructions present in ATmega16.Most of single clock cycle execution and 32*8 general purposes

Feature

- 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
- On-chip 2-cycle Multiplier
- Two 8-bit Timer/Counters with Separate Presales and Compare Modes
- One 16-bit Timer/Counter with Separate Presale, Compare,
- Four PWM Channels
- 8-channel, 10-bit ADC
- Byte-oriented Two-wire Serial Interface
- Special Microcontroller Features
- Power-on Reset and Programmable Brown-out
- Detection
    External and Internal Interrupt Sources
- I/O and Packages
    32 Programmable I/O Lines
    40-pin PDIP, 44-lead TQFP, and 44-pad MLF
- Operating Voltages

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LIQUID CRYSTAL 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. Many microcontroller devices use 'smart LCD' displays to output visual information. LCD displays designed around Hitachi's LCD HD44780 module, are inexpensive, easy to use, and it is even possible to produce a readout using the 8x80 pixels of the display.

They have a standard ASCII set of characters and mathematical symbols. For an 8-bit data bus, the display requires a +5V supply plus 11 I/O lines. For a 4-bit data bus it only requires the supply lines plus seven extra lines. When the LCD display is not enabled, data lines are tri-state and they do not interfere with the operation of the microcontroller. Data can be placed at any location on the LCD2 LCD, the address locations are: for 16*4

PIN DESCRIPTION

Most LCDs with 1 controller has 14 Pins and LCDs with 2 controller has 16 Pins (Two pins are extra in both for back-light LED connections).
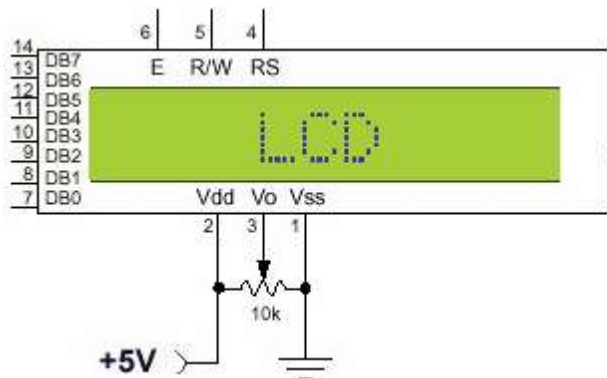


Fig 3.7. Pin diagram of 2x16 line LCD

Pin No.	Name	Description
Pin no. 1	VSS	Power supply (GND)
Pin no. 2	VCC	Power supply (+5V)
Pin no. 3	VEE	Contrast adjust
Pin no. 4	RS	0 = Instruction input 1 = Data input
Pin no. 5	R/W	0 = Write to LCD module 1 = Read from LCD module
Pin no. 6	EN	Enable signal
Pin no. 7	D0	Data bus line 0 (LSB)
Pin no. 8	D1	Data bus line 1
Pin no. 9	D2	Data bus line 2
Pin no. 10	D3	Data bus line 3
Pin no. 11	D4	Data bus line 4
Pin no. 12	D5	Data bus line 5
Pin no. 13	D6	Data bus line 6
Pin no. 14	D7	Data bus line 7 (MSB)

Table 3.8.Pin description of the LCD

Fuel Level Sensor

Fuel Level sensors detect the level of substances that flow, including liquids, slurries, granular materials, and powders. Fluids and fluidized solids flow to become essentially level in their containers

CIRCUIT DIAGRAM
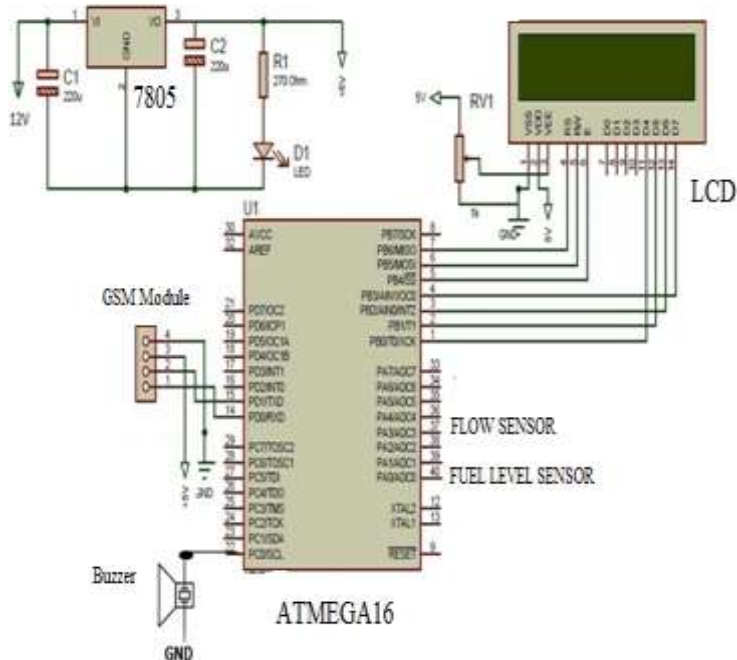
Working:

With rising prices of oil, fuel theft has become a very common incidence. From economic point of view a system is devised that will take care of these practices. Petrol Pump frauds were very common in a days. Many petrol pumps such

International Journal on Recent and Innovation Trends in Computing and Communication
Volume: 5 Issue: 1 (*Special Issue*)

ISSN: 2321-8169
06 - 09

that it display the amount as entered but in reality the inlet of fuel filled in the consumer tank is much lesser than the displayed value. So to overcome this problem in this project consist of digital display for displaying the exact volume of fuel in the fuel tank .The intension of measuring the fuel level has been to show the information on the system with a fuel meter. Such that this system cannot prevent us from getting cheated at petrol pump. In this system also there is fuel level sensor makes use of smart fuel theft detection with GSM alert. Using the microcontroller, the real time vehicle fuel content is sent to owners mobile in case of intrusion.

CONCLUSION

Digital Fuel Meter used for prevention from fuel theft & also it display the available fuel in tank in digitally. This meter is more advantages over analog meter by AVR microcontroller and GSM owner of bike is aware from fuel thefting using buzzer or SMS to the owner of bike. We increase the standard of measurement system using Digital Fuel Meter because of Digital Fuel Meter cheating with customer by fuel filling station can be avoided and performance of system also improved with the help of Digital Fuel Meter.

REFERANCES

[1] A.Avinashkumar, U.Singaravelan, T.V.Premkumar and K.Gnanaprakash, Digital fuel level indicator in two-wheeler along with distance To zero indicator. IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE), 11:80{84 Mar- Apr. 2014.

[2] Mrs.Udayavalli.V. , Mrs.M.Omamageswari, Embedded system based intelligent digital fuelGauge. IPASJ International Journal of Electronics and Communication (IIJEC), 2, March-April 2014.

[3] Kuna D. Dhande, Sarong R. gogilwar, SagarYele and Ass. Prof.VivekGandhewar, Fuel level measurement techniques: A systematic Survey. International Journal of Research in AdventTechnology.

[4] Muhammad Ali Mazidi, PIC microcontroller and Embedded System. (2013).

[5] Awadhesh Kumar Sandip Kumar SinghLecturer, Assistant Professor Department of Mechanical Engineering U.N.S.Institute of Engineering and Technology&V.B.S.Purvanchal University Jaunpur- Digital Fuel Indicator in Two Wheelers IJSRD – International Journal for Scientific Research & Development| Vol. 2, Issue 12, 2015 | ISSN (online): 2321-0613 All rights reserved by www.ijsrd.com 290

[6] Kuna D. Dhande, Sarong R. Gogilwar, SagarYele and Associate Prof. VivekGandhewar, "Fuel Level Measurement Techniques" A Systematic Survey.

[7] JaimonChacko Varghese, BineshEllupurayilBalachandran, "Low Cost Intelligent Real Time Fuel Mileage Indicator for Motorbikes".

[8] Mr.ShakibJaved S. Sheikh, Mr.Sumit D. Chambhare, Prof. V. R. Gandhewar, Prof. Mahesh S. Gorde, "Development and Fabrication of Alphanumeric Fuel Level Indicator for Two Wheelers".

[9] Madhav Murthy, ICDMM2014, ICDMM39, International Conference on Design, Manufacturing and Mechatronic Design and Fabrication of Digital fuel level indicator for two wheeler.