

## Vehicle Fuel Monitoring and Theft Detection System With SMS Indication using GSM

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### Abstract

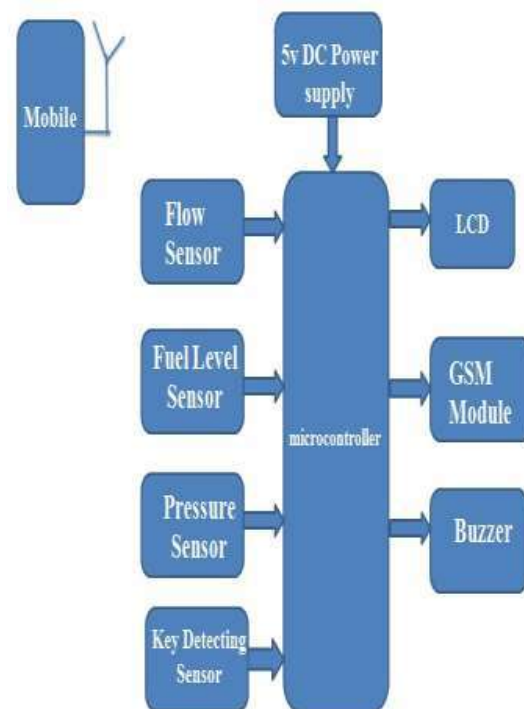
*Today's world want digital techniques for activity of any amount typical fuel meter area unit Analog so we have a tendency to attempting to create it digitized to indicate the fuel price digitally. In our project we have a tendency to show the quantity of fuel gift in fuel tank digitally i.e. 1lits, 1.5lits, 2lits etc. additionally fuel stealing is live drawback all told over world. In our project if fuel gets stealing then text message can send to owner of motorbike additionally buzzer makes noise so owner of motorbike get aware. In ancient vehicle system such quite system not enforced like show fuel convenience digitally & fuel stealing of motorbike are often avoided.*

**Keywords:** Analog, vehicle system, digitally, theft

### INTRODUCTION

Construction of an overseas fuel-level detector followed by remote observation of the backlog. Observation is finished by causation messages from a compatible movable. Messages square measure sent to the owner at regular interval of your time. An extra identifying feature of this analysis is that the protection of auto victimisation remote watchword. Siren also can be enabled throughout intrusion. This fuel-level observation system can guarantee economical use of fuel, minimize expense, and facilitate understand most profit. This method is user friendly, simply to put in and low value [1–4].

### SYSTEM ARCHITECTURE



**Fig.1:** System Architecture.

### Flow Sensor

Measure liquid/water flow for your star, conservation systems, storage tanks, water use home applications, irrigation systems and far additional. The sensors are solidly made and supply a digital pulse every time an quantity of water.

### GSM Module

This is a GSM/GPRS-compatible Quad-band cellular phone that works a frequency of 850/900/1800/1900MHz and which may be used not solely to access the web, however conjointly for spoken language (provided that it's connected to a mike and a little loud speaker) and for SMSs. Externally, it's sort of a massive package (0.94 inches x 0.94 inches x 0.12 inches) with formed contacts on four aspects in order that they will be soldered each on the side and at the lowest. Internally, the module is managed by an AMR926EJ-S processor, that controls phone Communication, digital communication (through an integrated TCP/IP stack), associate degree (through an UART and a TTL serial interface) the communication with the circuit interfaced with the cellular phone itself. The processor is additionally responsible of a SIM card (3 or 1, 8 V) that has to be connected to the outer wall of the module. The module is furnished continuous energy (between 3.4 and 4.5 V) and absorbs a most of 0.8 A throughout 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 [5–9]. 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 8bit Timer/Counters with Separate Presales and Compare Modes
- □ One 16bit Timer/Counter with Separate Presale, Compare,
- □ Four PWM Channels
- □ 8channel, 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
- □ Operat

### LIQUID CRYSTAL DISPLAY

A liquid crystal show (LCD) could be a skinny, flat show device created from any variety of color or monochrome pixels clothed before of a light-weight supply or

reflector. every component consists of a column of liquid molecules suspended between 2 clear electrodes, and 2 polarizing filters, the axes of polarity of that area unit perpendicular to every different. While not the liquid crystals between them, lightweight passing through one would be blocked by the opposite. The liquid twists the polarization of sunshine coming into one filter to permit it to labor under the opposite. Several microcontroller devices use 'smart LCD' displays to output visual info. LCD displays designed around Hitachi's LCD HD44780 module, area unit cheap, simple to use, and it's even potential to supply a readout exploitation the 8x80 pixels of the show. They need a regular computer code set of characters and mathematical symbols. For associate 8-bit knowledge bus, the show needs a +5V provide and eleven I/O lines. For a 4-bit knowledge bus it solely needs the provision lines and seven further lines. Once the LCD display isn't enabled, knowledge lines area unit tri-state and that they don't interfere with the operation of the microcontroller. Knowledge is placed at any location on the lcd2 LCD, the address locations area unit: for 16\*4, the address locations are.

**First line** 80 81 82 83 84 85 86 through 8F

**Second line** C0 C1 C2 C3 C4 C5 C6 through CF

### SIGNALS TO THE LCD

The LCD also requires 3 control lines from the microcontroller:

#### Enable (E)

This line permits access to the show through R/W and RS lines. Once this line

is low, the liquid crystal display is disabled and ignores signals from R/W and RS. Once (E) line is high, the liquid crystal display checks the state of the 2 management lines and responds consequently..

#### Read/Write (R/W)

This line determines the direction of knowledge between the liquid crystal display and microcontroller. Once it's low, information is written to the liquid crystal display. Once it's high, information is scan from the liquid crystal display.

#### Register Selects (RS)

With the assistance of this line, the liquid crystal display interprets the kind of information on data lines. Once it's low, an instruction is being written to the liquid crystal display. Once it's high, a personality is being written to the liquid crystal display.

#### Logic Status on Control Lines:

- E - 0 Access to LCD disabled- 1 Access to LCD enabled
- R/W - 0 Writing data to LCD- 1 Reading data from LCD

- RS - 0 Instructions- 1 Character

**Writing and reading the data from the LCD**

1. Writing data to the LCD is done in several steps:

- 1) Set R/W bit to low
- 2) Set RS bit to logic 0 or 1 (instruction or character)
- 3) Set data to data lines (if it is writing)
- 4) Set E line to high
- 5) Set E line to low

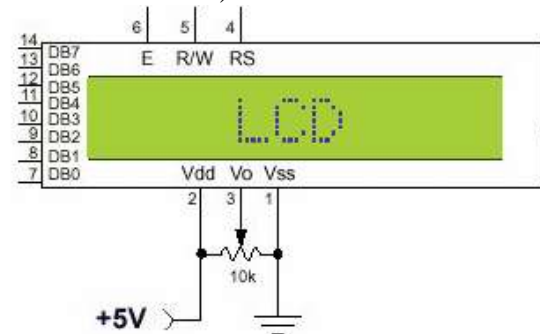
2. Read data from data lines (if it is reading):

- 1) Set R/W bit to high
- 2) Set RS bit to logic 0 or 1 (instruction or character)
- 3) Set data to data lines (if it is writing)
- 4) Set E line to high
- 5) Set E line to low

**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. 2:** Pin diagram of 2x16 line LCD.

**Table 1:** Pin description of the 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)

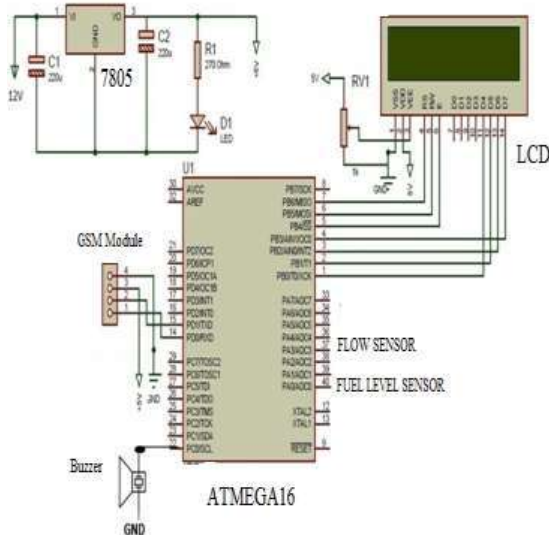
**Fuel Level Sensor**

Ultrasonic transducers area unit acoustic structural transducers that electrical signals in several frequencies convert to sound waves and unfold the signals in air. The inaudible reserve sensing element is employed to work out the amount of fuel in fuel tank. The inaudible electrical device is hooked up to the lowest of the fuel tank. This permits the inaudible waves cause vibration. The electricity ones area unit typically used for the determined frequencies, the electrical phenomenon ones have a good vary frequency space.



**Fig. 3:** Ultrasonic sensor.

**CIRCUIT DIAGRAM**



**Working**

With economic process of oil, fuel thievery has become an awfully common incidence. From economic purpose of read a system is devised that may pay attention of those practices. Petrol Pump frauds were quite common during a days. Several petrol pumps specified it show the number as entered however actually the recess of fuel crammed within the shopper tank is way lesser than the displayed price. Thus to beat this downside during this project incorporates display for displaying the precise volume of fuel within the fuel tank. The signification of mensuration the stockpile has been to point out the data on

the system with a fuel meter. Specified this technique cannot prevent us from obtaining cheated at petrol pump. During this system additionally there's stockpile device makes use of sensible fuel thievery detection with GSM alert. Victimization the microcontroller, the real time vehicle fuel content is shipped to house owners mobile just in case of intrusion.

**GSM SIM 900 Module**

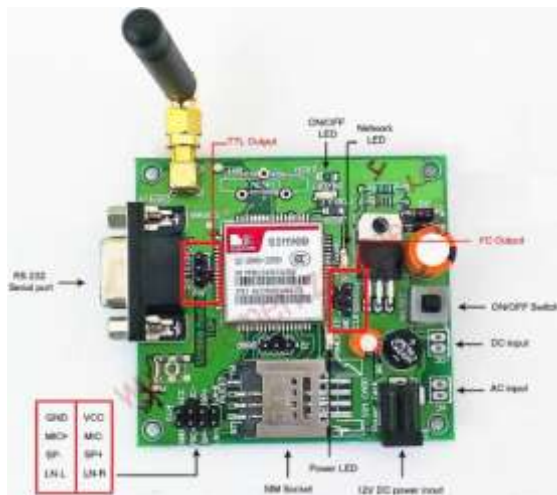
GSM (Global System for Mobile communication) is a digital mobile telephony system used to send short text messages. This is a wireless system with no limits to distance. During intrusion sms is sent to the predefined number through the GSM. In this system GSM SIM 900 module is made use of. The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900 MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. With a tiny configuration of 24mm x 24mm x 3mm, SIM900 can fit almost all the space requirements in your M2M application, especially for slim and compact demand of design. SIM900 is designed with a very powerful single-chip processor integrating AMR926EJ-S core

- Quad - band GSM/GPRS module with a size of 24mmx24mmx3mm
- SMT type suit for customer application
- An embedded Powerful TCP/IP protocol stack
- Supply voltage range: 3.2 to 4.8V
- Low power consumption: 10 mA (sleep mode & BS-PAMFRMS=9)
- Operation temperature: -40°C to +85 °C

This component digitizes and compresses the data and sends it along with two other



streams of user data, each in its own time slot. The modem needs only 3 wires (Tx, Rx, GND) except Power supply to interface with Microcontroller/Host PC. SIM900 is designed with power saving technique so that the current consumption is as low as 1.0 mA. SIM900 is integrated with TCP/IP protocol. It can send and read SMS, connect to internet via GPRS through simple AT commands [5]. Fig.3 below shows the image of SIM900 and fig.4 shows the GSM modem along with SIM900 used in the present study.



**Fig. 5:** SIM900 GSM Module



**Fig. 6:** GSM modem

## 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.

## RESULT

The how much actual amount of petrol is inserting in our bike tank is display on LCD of bike also it display the available petrol in tank in digitally. If fuel is theft by someone the buzzer will go on and message will send to the owner through GSM system. Some time we forgot our key to bike that time sensor sense the key and message will send to the owner through GSM within few minute.

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