

Fuel level Indicator in Cargo Tank

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ABSTRACT: In this digitized world, if the fuel indicator in the automobiles is also made digital and using GSM technology will help to know the exact amount of fuel filled in the cargo fuel tank which is to be transported. From this project we found out a proper solution for indicating the exact availability of fuel in the tank. Here we are indicating amount of fuel in the tank in percentage. This value percentage will be in numerical digits. This project mainly concentrates about the indication of fuel level in cargo vehicle tanks which transport fuel. In our project the main blocks are micro controller unit, sensor and GSM.

KEYWORDS: Fuel, cargo, GSM.

I. INTRODUCTION

Today's world is digitized so in this digitized world we are including a new way of monitoring fuel level in cargo tanks. It is called the "FUEL LEVEL INDICATOR IN CARGO TANKS". Today in this digitized world, if the fuel indicator in the automobiles is also made digital and using GSM technology will help to know the exact amount of fuel filled in the cargo fuel tank.

Now a day's fuel such as petrol, diesel, etc. plays a very important role in human life. The main motivating fact about this project is indicating of fuel in vehicles through GSM. Usually only the driver of the vehicle is sent with the tank to get the fuel in huge amount. Some people are not trust worthy than so the driver can fill the tank as much as he wants and gets the receipts of tank full. To reduce this risk and overcome this problems the paper provides information in details.

The aim of our project is to monitor the level of the fuel in the cargo fuel tank and to automatically indicate the level information through GSM to the owner of the vehicle.

Applications-

Some applications of video summary are:

1. This project can be implemented in cargo vehicles.
2. Low cost.
3. Easy to identify fuel.
4. Easy to get information about fuel in cargo fuel tank.

Literature Survey

A literature survey represents a study of previously existing material on the topic of the report. So there are some similar topics compared to our project. [1] Digital fuel level indicator. [2] Wireless Propane Tank Monitoring.

Digital fuel level indicator:

The aim of this project is to monitor the level of the fuel in the vehicle fuel tank and to automatically indicate the level information through LCD display

In our project the main blocks are micro controller unit, fuel level sensor and LCD display unit. The fuel level detection circuit is used to detect the level of the fuel in the tank; here sensors are placed at certain places to find out the fuel

level and the signals are sent to the micro controller unit for further operations. Here sensors are placed at various places to sense the fuel level and the signals from these sensors are sent to the micro controller unit to decide the exact level information. When the fuel level reaches the top level sensor which means that the tank is full and this will be indicated to the user by means of beep noise and the level information is indicated through LCD. Here the level information is displayed in terms of percentage and this information is preprogrammed according to the sensor position.

Wireless Propane Tank Monitoring:
Many companies often overlook monitoring their propane fuel levels. This means, at any given moment, you're vulnerable to running out of fuel and quickly into a power outage. With your uptime directly depending on your generators as a power source, it's simply too risky to leave such a high-value piece of equipment unmonitored. In this application, the propane levels are checked once per day to ensure proper levels. However, if the power fails (and therefore the generator turns on), the propane levels are configured to be checked at a more frequent rate. This creates thorough visibility over fuel levels while conserving the battery-powered Wireless Extender. This wireless sensor application means that there's no need to run conduit to the fuel tank. This ultimately saves money and provides isolation so the conduit doesn't act as a lightning rod directly to your tank.

II. METHODOLOGY

In methodology we present the method for Fuel level indicator in cargo tank. The process is done with the help of GSM technology. The GSM technology is used for reading and sending SMS to the concerned person. Global system for mobile communication (GSM) is globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982. It is estimated that many countries outside of Europe will join the GSM partnership.

Algorithm:

- Step 1: Inputs are taken from Fuel filled in a tank.
- Step 2: The sensor works on the true or false logic and sends signals accordingly.
- Step 3: The outputs from the sensors are connected to the ARM-controllers.
- Step 4: The microcontroller sends signals from port 3 to the GSM modem.
- Step 5: The GSM modem sends message to the pre-fed numbers.
- Step 6: the controller receives message on his cell phone.

Block Diagram:

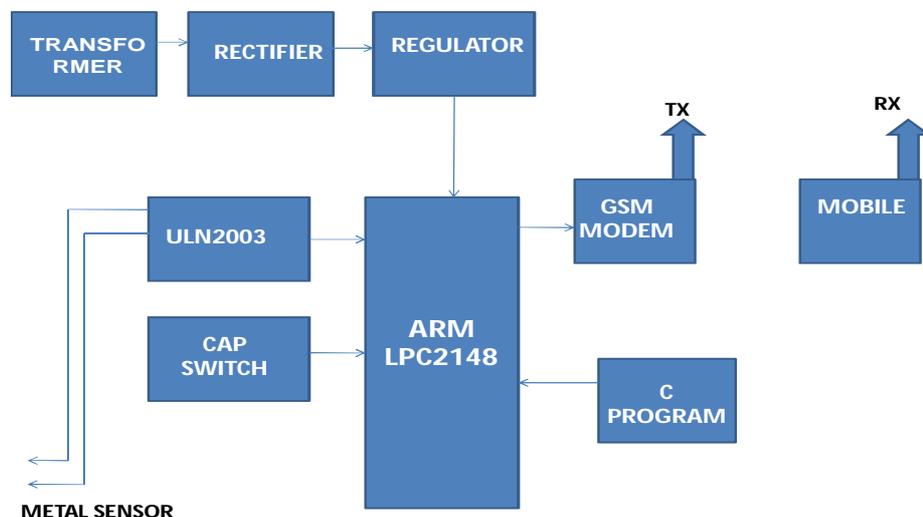


Fig.1. Block Diagram Representation.

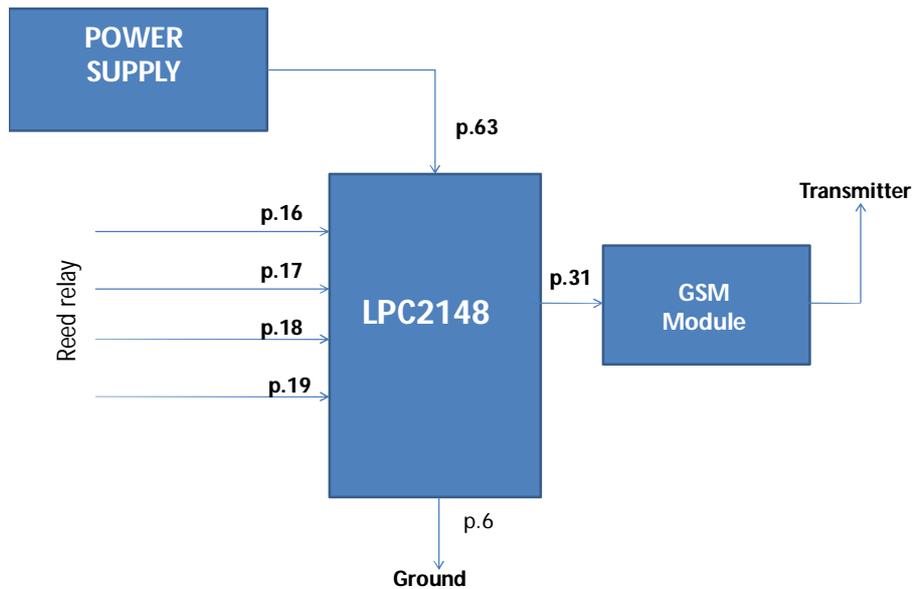


Fig.2.Pin Connections of LPC2148.

Preliminary Design and Detailed Design:

Block diagram comprises of ARM-controller, read-relay sensor, regulated power supply, GSM module. The read-relay sensor is interfaced to ARM-controller via port pins. The amount of fuel rate produced is fed to ARM-controller. Most digital logic circuits and processors need a 5 volt power supply, to use these parts we need to use regulated 5 volt source, usually you start with an unregulated power to make a 5 volt power supply. we use voltage regulator. The GSM modem is used for sending messages from an ARM-controller to a owner. The ARM-controller will automatically send signal to GSM modem. Through the GSM modem the message will give to a concerned person or owners. For the circuitry operation it requires the +5V DC power supply.

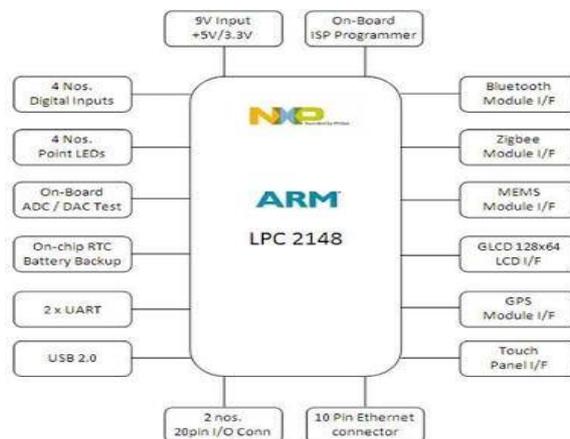


Fig.3. ARM LPC2148 Microcontroller

ARM-CONTROLLER (LPC2148):

The LPC2148 ARM-controller are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine ARM-controller with embedded high speed ash memory ranging from 32 KB to 512 KB. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 Due to their tiny size and low power consumption, LPC2148 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale.

Key Features of ARM-controller

1. 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip ash memory. 128-bit wide interface/accelerator enables high-speed 60 MHz operation.
2. In-System Programming/In-Application Programming (ISP/IAP) via on-chip boot loader software. Single ash sector or full chip erase in 400 ms and programming of 256 bytes in 1 ms.
3. Embedded ICE RT and Embedded Trace interfaces offer real-time de-bugging with the on-chip Real Monitor software and high-speed tracing of instruction execution.
4. USB 2.0 Full-speed compliant device controller with 2 kB of endpoint RAM. In addition, the LPC2146/48 provides 8 kB of on-chip RAM accessible to USB by DMA.
5. Single 10-bit DAC provides variable analog output (LPC2142/44/46/48 only).
6. Two 32-bit timers/external event counters (with four capture and four compare channels each), PWM unit (six outputs) and watchdog.
7. Low power Real-Time Clock (RTC) with independent power and 32 kHz clock input.

GSM MODEM:

GSM (Global System for Mobile Communications) is world's most famous Mobile platform. Mobile phones with SIM cards use GSM technology to help you communicate with your family, friends and business associates. Interfacing of GSM unit is done through a serial communication link with microcontroller LPC 2148. Whatever data is to be sent to GSM unit is done through this RS 232 link. The Level translator Translates TTL voltage level to RS-232 compatible level. It is realized with MAX 232.

GSM systems have following advantages over basic land line telephony systems:

- 1) Mobility
- 2) Easy availability
- 3) High uptime

It describes the hardware interface of the SIMCON SIM900 module that connects to specification. c application and the air interface. As SIM900 can be integrated with a wide range of applications, all functional components of SIM300 are described in great detail.

REED RELAY:

A reed relay is a type of relay that uses an electromagnet to control one or more reed switches. The contacts are of magnetic material and the electro-magnet acts directly on them without requiring an armature to move them. Sealed in a long, narrow glass tube, the contacts are protected from corrosion, and are usually plated with silver, which has very low resistivity but is prone to corrosion when exposed, rather than corrosion-resistant but more resistive gold as used in the exposed contacts of high quality relays. The glass envelope may contain multiple reed switches or multiple reed switches can be inserted into a single bobbin and actuate simultaneously. Reed switches have been manufactured since the 1930s.

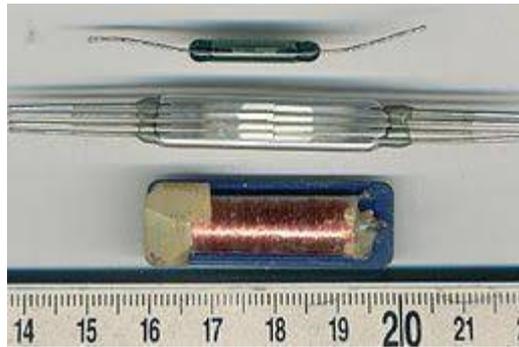


Figure.4. Reed Relay.

III. RESULTS



Fig.5. Final Implemented Model

Fig.5 shows the prototype model of the level indicator. Where the system is embedded through the GSM model and as the sensors detects the level by the presence of the liquid and gives an output to the modem.

IV. CONCLUSION AND FUTURE WORK

The GSM network is used to help the user to control the system from a distant area by sending message to phone. Reed relay sensor monitoring by using wireless are the challenges faced by liquid transports. By this method we can easily make an interact with the device and the user. By this we can add many tanks or serial tanks to a single owner list. By applying the GPS system we can track the vehicle and control the level of the fuel.

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