PUC MEASUREMENT WITH INFORMATION PORTAL USING GSM & SMART CARD

1JAMBHALE TAI, 2KAYGUE MONIKA, 3KHOMANE TEJASWI

SVPM College of Engineering
Malegaon (Bk.), Baramati, Pune; 413115

Abstract: PUC Measurement system is used to check Concentration of Carbon mono-oxide in vehicle. It is implemented using two units 1) Handheld unit 2) server unit. Handheld unit is for traffic police to check concentration of CO percentage. First we swap RFID card infront of RFID reader to get information of user. RTC is used to check the validity of smart card. CO sensor indicate concentration of the CO in percentage & display it on LCD. Handheld unit send message to server unit through GSM. Server unit is for RTO office. It checks the percentage of CO. if CO% is above limit then fine is deduced from user account and this is displayed on LCD.
PUC measurement system is implemented using ARM7 (LPC 2148) micro-controller using GSM & RFID.

Keywords: MQ 9 Sensor, GSM Module, RFID Techniques, RTC, LCD, Keypad, buzzer, ARM7.

Introduction
Tremendous innovations have been made in the technology and manufacturing of cars as well as in the pollution control department but still nothing significant achieved of it. This idea employs an MQ9 Sensor which is economical and capable of detecting Carbon Monoxide gas emitted from the vehicle. The sensed percentage or proportion is send to RTO office. Then RTO office check whether CO proportion is more than limit or within a limit. If it is greater than the limit or within a limit then it will check. If it is greater than limit then fine can be deduced from user account. And it is displayed on LCD.

This is done with the help of GSM at traffic police. The ARM7(2148) Micro controller is used to transfer the information to the GSM system from the MQ9 sensor. There are two GSM modems involved one at traffic police and one at RTO office for communication. An RFID is used to collect the information of vehicle and owner with a particular serial number. This information will be displayed on an information portal which nothing but a 16x2 LCD. The aim of this system is to make PUC measurement process easy with various functions like information portal, RFID techniques & communication through GSM and to make this process transparent.

1. NEED OF SYSTEM
Pollution and especially air pollution has always been a serious threat to the environment. One of the very important factors responsible for air pollution is the emission of gases from the vehicles such as CO which degrades the environment. A really important need here is to curtail the amount of harmful gases which are emitted from the vehicles. This can be done with the help of regular PUC checks of the vehicles but this method has proved to be a failure when undertaken by government authorities. Nowadays we see that the regular PUC checking system is not that accurate. Except at the petrol pumps, PUC checks at all other places are done at random basis. Sometimes PUC are issued merely on the basis of the number of the vehicle without actual diagnostics of the vehicle. Besides this nowadays the tendency of keeping the vehicles maintained by regular services has disappeared. Everything cannot be left for government. Every vehicle needs to diagnose its pollutants on its own and that is where the idea of this paper resides. This paper will help to achieve this aim as the whole PUC system will be assembled in the car itself.

2. PROBLEM DEFINATION
Pollution and especially air pollution has always been a serious threat to the environment. One of the very important factors responsible for air pollution is the emission of gases from the vehicles such as CO which degrades the environment. A really important need here is to curtail the amount of harmful gases which are emitted from the vehicles. This can be done with the help of regular PUC checks of the vehicles but this method has proved to be a failure when undertaken by government authorities. Nowadays we see that the regular PUC checking system is not that accurate. Except at the petrol pumps, PUC checks at all other places are done at random basis. Sometimes PUC are issued merely on the basis of the number of the vehicle without actual diagnostics of the vehicle. Besides this nowadays the tendency of keeping the vehicles maintained by regular services has disappeared. With the help of this system the random PUC checking, less awareness about PUC can be avoided and process could be made transparent means no one can interfere with the process in any way.
3. LITERATURE SURWAY:
1. PAST SYSTEM: The past system of PUC measurement there is no use of the keypad and RTC hence system is not secure and validity of smart card is not checked.

2. PRESENT SYSTEM:
ADVANTAGES: In our present system we are using keypad to enter the password. RTC is used to check the validity of smart card.

DISADVANTAGES: In present system regular PUC checking system is not accurate. Sometimes PUC are based on the number of vehicle & not of the actual diagnostics of the vehicle. Vehicles are not maintained the regular service.

3. FUTURE SYSTEM: In this system all the limitations are overcome. The system is accurate. Hence this system is more advantageous.

4. BLOCK DIAGRAM:

1. Handheld unit:

```
<table>
<thead>
<tr>
<th>LCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTC</td>
</tr>
<tr>
<td>CO SENSOR</td>
</tr>
<tr>
<td>Power supply</td>
</tr>
</tbody>
</table>

Microcontroller → Buzzer

Keypad → Smart card interface

MAX 232 → GSM
```

2. Server unit:

```
<table>
<thead>
<tr>
<th>LCD</th>
</tr>
</thead>
</table>

Microcontroller → MAX 232

MAX 232 → GSM
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5. BLOCK DIAGRAM DESCRIPTION

Two ARM7 (LPC 2148) is microcontroller used in this system. A 3.3v regulated power supply is given to this microcontroller, along with this the components needed for the system such as,

- Keypad
- RFID Reader
- RTC
- CO sensor
- 16x2 LCD
- Buzzer
- MAX 232
- GSM Modem

1. SIM 900_RS232 is a GSM Modem interfaced to a microcontroller.
2. Carbon mono-oxide sensor is MQ9 sensor is interfaced to a microcontroller to sense CO coming out from a vehicle.
3. 16x2 LCD is interfaced to a microcontroller which is going to be used as an Information Portal which will display the information of a vehicle, information of an owner and some other if needed also % of CO.
4. EM18 Reader module is used in this system for getting information about user.
5. MAX 232 is a voltage level controller IC connected to a microcontroller and also used for serial communication.

6. WORKING

In this system we are going to sense Carbon Mono-oxide which comes out of vehicle. MQ9 is the CO sensor which will be used by us to detect concentration of CO in vehicle. First owner will swap his RFID card which will let his display on 16x2 LCD. ARM7 (LPC 2148) is a microcontroller which are going to use to control all the parts of the system. Using MQ9 sensor concentration of CO is recorded and a report will be sent to centre office or RTO using GSM.

7. ADVANTAGES

- PUC measurement system could be easy and transparent.
- As we are using RFID reader, display the information of user and vehicle with one swipe.
- Use of GSM makes effective communication.
- Helps to protect an environment.

8. APPLICATIONS

- Measurement of concentration of CO in vehicle.
- In industries where wireless air pollution control system is required.
- Also helpful in some chemistry labs where proportion of gases in lab atmosphere is strictly noticeable.

9. FUTURE SCOPE:

- Corruption can be reduced.
- Wireless system for pollution can be developed with various features.
- System can be developed for detecting proportion of various gases.

10. CONCLUSION

- From PUC measurement system we conclude that this system is useful for measurement of CO% and also useful for pollution detection.

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