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PUC MEASUREMENT SYSTEM WITH INFORMATION PORTAL USING GSM AND RFID

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Abstract

PUC Measurement system is used to check Concentration of Carbon mono-oxide in vehicle. When person visit PUC center to gen PUC certificate, he has to check concentration of CO in vehicle. First he swap RFID card in front of RFID reader, this 12 digit unique code along with concentration of CO in % is sent to RTO office using GSM modem. GSM modem connected to central PC station receives this SMS. Vehicle information is saved in access database against unique RFID card. If concentration exceed above limit auto SMS will be send to PUC center that servicing required for vehicle. Do not allow to PUC certificate. In this line of thought, the proposed PUC measurement system is implemented using PIC16F877A micro-controller using GSM & RFID.

Key Words: MQ 7 Sensor, GSM Module, RFID Techniques

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 MQ7 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 who will check whether CO proportion is more than limit or within a limit. If it is less than the limit or within a limit then it will send a message to PUC office as well as to owner of vehicle which includes whether certificate is granted or not. This is done with the help of GSM at PUC office. The PIC16F877A Micro controller is used to transfer the information to the GSM system from the MQ7 sensor. There are two GSM modems involved one at PUC office 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 that 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 PUCs are issued merely on the basis of 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

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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. [1]

2. PROBLEM DEFINATION

Pollution and especially air pollution has always been 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 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 transparent means no one can interfere with the process in any way.

3. LITERATURE SURWAY

Discussions about air pollution often begin with the composition of the atmosphere. In particular, the discussion often focuses on how a particular part of the troposphere or stratosphere deviates in quality from a norm. Popular perceptions of air pollution are driven largely by fear. Inspection and maintenance measures to control emissions from in-use vehicles are an essential complement to standard for new vehicles. Although difficult to implement an effective inspection and maintenance program can significantly reduce emissions from uncontrolled vehicles I/M programs are also needed to ensure that the benefits of new vehicle controlled technologies are not lost through poor maintenance and tampering with emission controls. I/M programs for Gasoline Vehicles, commonly include measurement of hydrocarbon and carbon monoxide concentrations in the exhaust.[1] Previously a mobile PUC system in which a PUC measurement device was connected to a vehicle itself which was giving an alert to a driver about CO proportion in the vehicle. But driver may ignore those warnings which will again cause a reason for pollution. In our system were trying to avoid all such things to make this process transparent.

4. BLOCK DIAGRAM:

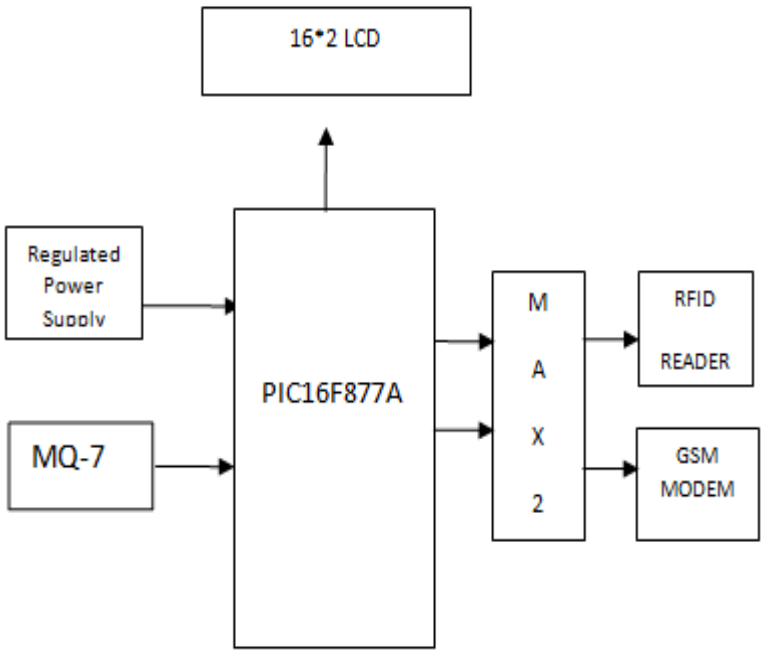

Figure 1: Block Diagram

5. BLOCK DIAGRAM DESCRIPTION

PIC16F877A is micro controller used in this system.
A 5v regulated power supply is given to this micro controller, along with this the components needed for the system such as,

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

1. SIM 900_RS232 is a GSM Modem interfaced to a micro controller.
2. Carbon mono-oxide sensor is MQ7 senso is interfaced to a micro controller to sense CO coming out from a vehicle.
3. 16x2 LCD is interfaced to a micro controller which going to be used as an Information Portal ,which will display the information of a vehicle, information of a owner and some other if needed.
4. EM18 Reader module is going to be used in this system for reading a number from RFID card.

6. MAX 232 is a voltage level controller ic connected to a micro controlled and also used for serial communication.

7. CIRCUIT DIAGRAM

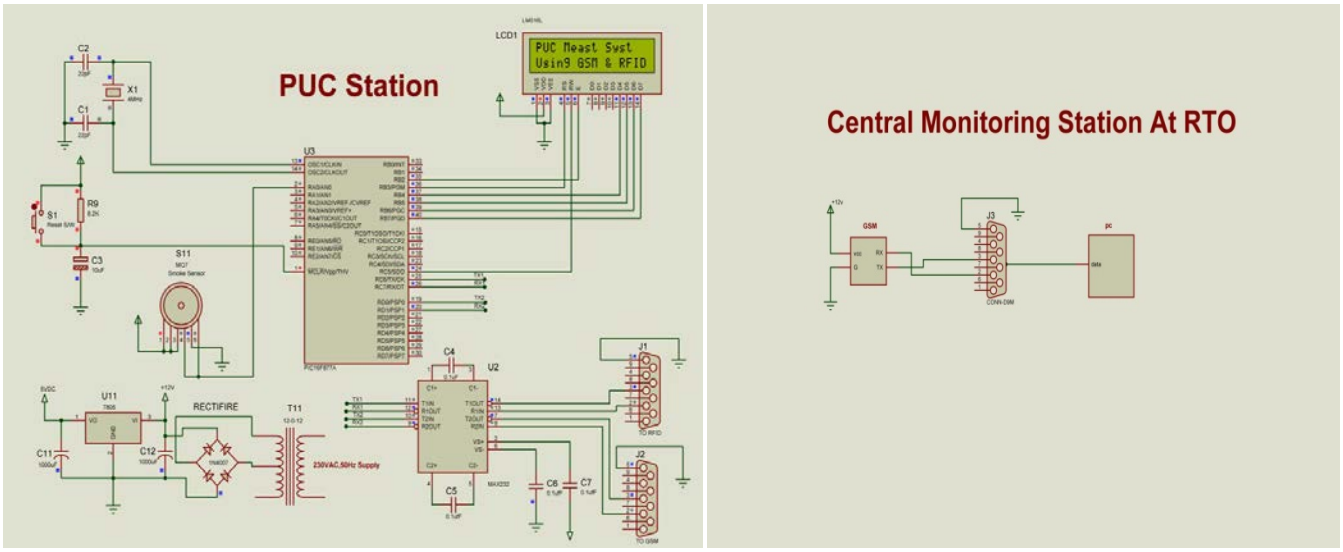

Figure 2: CIRCUIT DIAGRAM

8. WORKING

In this system we are going to sense Carbon mono-oxide which comes out of vehicle . MQ7 is the CO sensor which will be used by us to detect concentration of CO in vehicle.First owner will swipe his RFID card which will let his display on 16x2 LCD. PIC16F877A is a microcontrller which are going to use to control all the parts of the system. Using MQ7 sensor concentration of is CO is get recorded and report will be sent to centre office or RTO using GSM.Concentration of CO will be cheaked by office, if it exceeds limit then certificate of PUC will not be allocated to that vehicle else allocated.The report of allocation or disallocation of PUC certificate will be sent PUC centre through GSM.

9. 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.

10. DISADVANTAGES

As we are using GSM the PUC office or RTO office should be in well network area.

11. APPLICATIONS

- Measurement of concentration of CO in vehicle.
- In industries where wireless air pollution control system is required.

- Not only CO but also sensors for various gases can be attached to this system.
- Also helpful in some chemistry labs where proportion of gases in lab atmosphere is strictly noticeable.

12. FUTURE SCOPE:

- In the near future every vehicle will have its own PUC system which will be beneficial for both owner as well as the pollution control department.
- Wireless system for pollution can be devolped with various features.
- System can be developed for detecting proportion of various gases

13. CONCLUSION

This system is capable to measure the value of pollutant CO emitted by the vehicle continuously and sends report to RTO using GSM .RTO will check the concentration of CO and accordingly allow the PUC certificate. RFID reader is used to display owner's information on 16x2 LCD by reading serial number.

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