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MONITORING AND VALIDATING THE EXPIRY OF NON-FC VEHICLES USING GSM TECHNOLOGY

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ABSTRACT

Aim of this paper is to design and develop automatic FC monitoring system for automobile. The paper is mainly focused on reducing the number of accidents on today's roads. The system makes use of GSM (Global System for Mobile Communication) technology. The system consists of transmission unit at the RTO (Regional Transport Office) and reception unit available at the vehicle. The vehicle details are fed into a system (for identification purpose) which is available at the transmission unit in the RTO. The database which contains the vehicle identification details are maintained and controlled by LabVIEW. On sensing the expiration of FC validity, the GSM module in the transmission unit, sends the instructions to the GSM module available at the receiver unit (vehicle) which in turn makes it possible to lock and unlock the vehicle. The vehicle is then stopped by locking the fuel valve of the engine, which is controlled by the transmission unit in the RTO.

Keywords — GSM, PIC Microcontroller, FC Validation, RS 232

I. INTRODUCTION

The NON-FC vehicles causes pollution and tends to many accidents on today's road, so in order to reduce these number of problems it is necessary to design, monitor and control NON-FC vehicles using GSM technology. In this technology, generally all motor vehicles details such as vehicles register number, model of vehicle, vehicle validity period, time stamp registration of individual vehicle and some other information about the vehicles are registered in the RTO office. The registration periods of vehicles are valid for certain period of time, after these certain period of time (expiry period of vehicle) renewal of vehicle registration has to be done.

The system has transmitter unit which is placed at the RTO office and this unit consists of microcontroller, GSM unit and system (CPU) and receiver unit which is placed at the vehicles and this unit consists of LCD display, driver circuit, buzzer, GSM module and PIC (microcontroller) 16F877A. Using vehicles on road without renewal of vehicle registration is punishable, but peoples are tending to use the vehicles with ecbatic registration and it is difficult to identify all such vehicles without the system. After the registration of vehicles the details of registered vehicles are stored (fed) into the system. Those details are used for identifying all NON-FC vehicles. GSM are used for data transfer between the transmitter unit and receiver unit, like sending the intimation message to the receiver unit (NON-FC VECHICLES). Microcontroller sends SMS to off (stop) fuel supply, when the receiver doesn't respond to that intimation message send from the RTO office it is not only punishable but also tends to

pollution. So, the main aim is to avoid pollution by designing and development of automatic FC monitoring systems for automobiles.

II. TRANSMITTER AND RECEIVER UNIT

2.1. Transmitter Unit*A transmitter unit is developed which consists of GSM, microcontroller and system to identify and stop the non FC vehicles.*

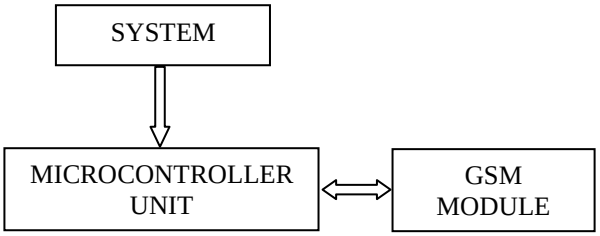

Fig.1. Block diagram of Transmitter unit.

Intimation messages are send to the vehicle ahead a week from the date of expiry. Transmitter unit consists of system in which the details of vehicles such as vehicle model, expiry period, registration number, license number and other more details are stored in these systems for an identification of expired registration of all the vehicles (non-FC vehicles). Microcontroller unit is interfaced with the GSM module, GSM is used to communicate between the transceivers units [1, 2], [5], [7]. The microcontroller sends the SMS to the receiver through GSM to stop the fuel supply after the vehicle registration period has been expired.

2.2. Microcontroller at Transmitter Unit

Microcontroller is a small computer which contains core processor, memory, input and output peripherals are embedded on a single chip. It is also called as a mini computer. It is built for the purpose of doing specific task (relation of input and output is mentioned). The transmitter pin of this microcontroller is connected with the receiver pin of GSM and the receiver pin of the microcontroller is connected with the transmitter pin of GSM. Microcontroller operates at +5volt supply. If the vehicles expiry date is ahead a week, the warning messages are send to the GSM in receiver unit periodically. When the expiry date is met overdue message is send to both the receiver unit and owner mobile. After the overdue message is displayed in the LCD display the fuel supply of the vehicle is cut down using DC solenoid valve.

2.3. GSM MODULE

GSM are specially used for digital cellular communication. It is interfaced with the microcontroller to communicate between the transmitter and receiver unit. Its operating frequency is about 900MHZ. The GSM Modem transmits a message through SIM card or else we may use mobile phone as a GSM module at both the receiver and transmitter side. GSM is a mobile phone without a display. Its advantages are world-wide connectivity, high transmission capacity and high quality [2-4], [7].

2.4. RS-232 (MAX-232)

RS-232 standard is used for serial communication and information in the RS-232 is converted into compatible TTL logic through MAX232. The serial communication standard RS232 is commonly used in computer serial ports and it has been used for industrial devices. However, today RS-232 standard connect with microcontroller are internally or externally connected and it is widely used for a communication purpose. It means communication between office which used automatic technology and PC peripheral devices or home appliances [2-4], [7]. It is used for serial communication between the system where the vehicle data are fed into the system for identification and microcontroller, then the microcontroller will act based on the information from the system through RS-232 and its operating voltage is about +12volt.

2.5. Receiver Unit

The microcontroller used at the receiver side is connected with display, driver circuit, buzzer, GSM module and its act as a heart of the circuit. It is a 40 pin IC and it has 14 bit word of flash memory, it has 5 inputs / output ports, its operating voltage range is from 4.0 to 5.5 volts. It has a memory of 5,368 bytes of data RAM, 256 bytes of data EEPROM, high performance of RISC, 8 channel analog to digital converter and its operating frequency is about 20MHZ. It will receives the intimation message sent by the transmitter through the GSM [1, 2],[4],[7]. Microcontroller at the receiver side works based on the SMS sends by the transmitter unit. After the expiry period of the vehicles registration, microcontroller at the transmitter send the message to the receiver unit to stop the fuel supply and also, the microcontroller at the receiver display the message through LCD which in turn sends the message to the driver circuit to cut the fuel supply with the help of DC solenoid.

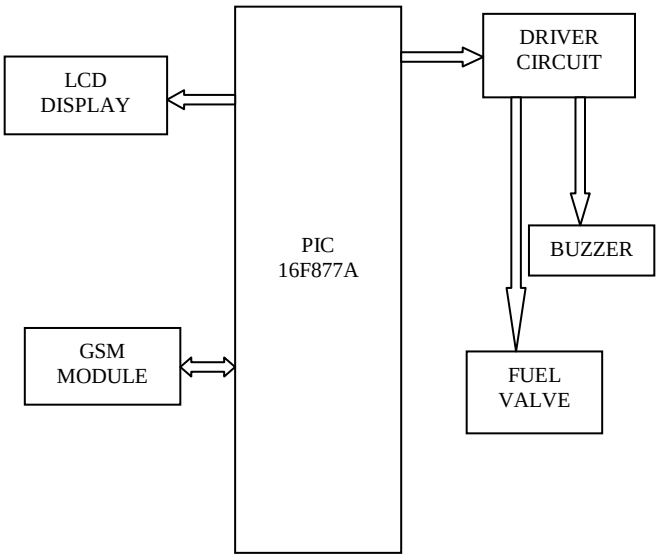

Fig.2. Block diagram of Receiver unit.

LCD has materials which combine both the properties of liquids and crystals. It operates at +5volt and it easily fit with the microcontroller. LCDs are very easily programmable, economical and it is widely used in many applications including television, computers and aircraft and so on. It has 8-bit of data pins and it consumes very low power. The buzzer which is connected with the driver circuit is nothing but an audio signalling device, it also have alarm and timer devices. Once the expiry date is met, the transmitter in the RTO office send the intimation message to the receiver to cut the fuel supply, that intimation message also contain the information in which the

fuel supply will be cut after 30 minutes, so within this 30 minutes user should park their vehicle safer otherwise the vehicle is stopped promptly in that current running location. Driver circuit is connected with fuel value and buzzer.

III. RESULTS

In this system, the details of vehicles such as vehicle sold date, FC notification date and FC over due date other more details are stored in these system for an identification of expired registration of all the vehicles. It has been implemented using LabVIEW, which is a highly productive development environment for creating custom applications that interact with real- world data or signals in fields such as Engineering and automation.

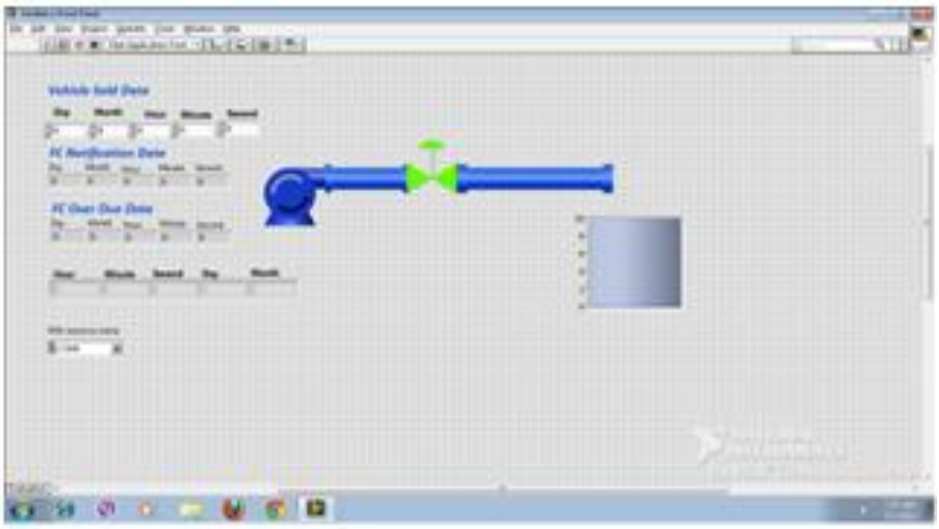

Fig. 3.LabVIEW implementation of validating the expiry of Non-FC Vehicles

Fig. 3, shows the LabVIEW implementation of validating the expiry of Non-FC Vehicles in turn graphical representation is done and verified.

Fig. 4, shows the LabVIEW implementation of transmitter unit which is placed at the RTO office. The LabVIEW implementation is done and verified. In this system, the vehicle's sold date details are continuously compared with the system running time , in means of year, month, day, hour, minutes and seconds. Once it is met, after sometime delay using timer, warning messages are send to the receiver unit through GSM periodically, if not the conditional statement remains in false state and no messages are sent to the receiver unit. Another case structure within the flat sequence is used for checking the overdue details of vehicles, once the expiry date of vehicles are met, the case structure comes to true state from false one and overdue messages are sent to the receiver unit, if not no messages are sent. Visa port is used for interconnecting the system and the hardware.

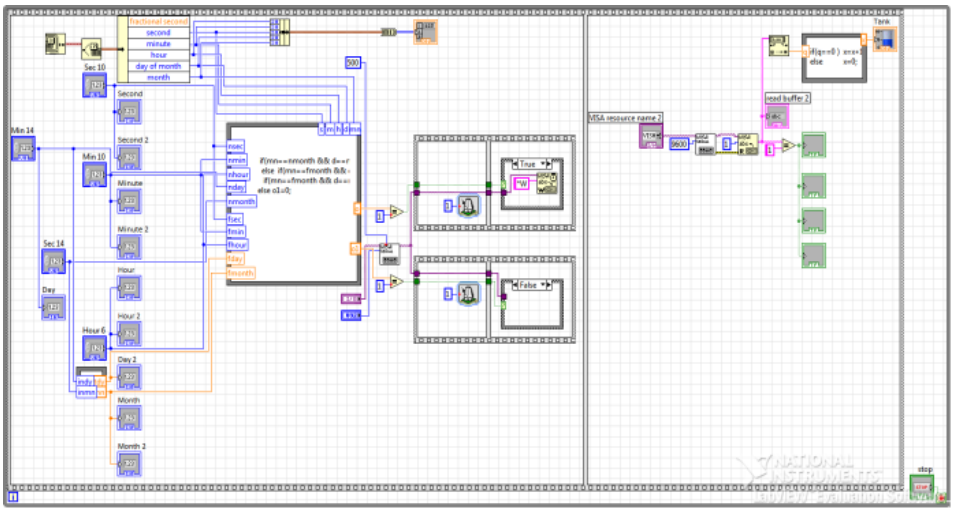

Fig. 4.LabVIEW implementation of transmitter unit

IV. CONCLUSION

Thus the design and development of automatic FC validity monitoring system for an automobile is implemented. In this system, it is designed to improve vehicle fitness which in turn reduces accident and minimizes pollution is checked and verified using LabVIEW Software. In this regard, mobile communication is introduced into embedded system. One another advantage is that it can be implemented at lower cost.

REFERENCES

[1] PrashantA.Shinde, Y.B.Mane, "Advanced vehicle Monitoring and tracking system based on Raspberry Pi," IEEE 9th International Conference, Coimbatore, pp. 1-6, January 2015.

[2] SeoKjuLee, Tewolde, G. JaerockKwon,"Design and implementation of vehicle tracking system using GPS/GSM/GPRS technology and smartphone application," Seoul, pp. 353-358, March 2014.

[3] Ai Rashed,Oumar, Singh, "A Real Time GSM/GPS Based Tracking System Based On GSM Mobile Phone," FGCT second International Conference on.London,pp.65-68,November 2013.

[4] Sehgal, V.K.Singha, M.; Mangla, "An Embedded Interface for GSM Based Car Security System," CICSyN Fourth International Conference on Phuket, pp.9-13, July 2012.

[5] Dr. Rangarajan, Dr. Sakunthala, and R. Sendhilkumar "Design and Implementation of Zigbee-RFID Based Vehicle Tracking," SEISCON International Conference on Chennai, pp.689-694, July 2011.

[6] Hu Tingling, and Li Haifeng, XuXu, Li Jian, "An Intelligent Vehicle Monitoring System Based on Internet of Things,"CIS 7th International Conference on Hainan, pp.231-233, December 2011.

[7] PengChen, and Shuang Liu "Intelligent Vehicle Monitoring System Based on GPS, GSM and GIS," ICIE, WASE International Conference on Beidaihe, vol.1, pp.38-40, August 2010.