JOURNAL OF MULTIDIMENSIONAL RESEARCH & REVIEW

Website: http://www.jmrr.org Vol.3, Iss.4 Pages:14-19

MICROCONTROLLER BASED AUTOMATIC FC DATE MONITORING AND CONTROLLING SYSTEM

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Article Received: December 2022 Published: January 2023

Abstract

In order to lessen the number of problems caused by NON-FC vehicles, which contribute to many accidents and pollution on today's roads, NON-FC vehicles must be designed, monitored, and controlled utilising GPS technology. According to this technology, the RTO office is where all motor vehicle information is registered. This information includes the vehicle's register number, model, validity term, time stamp, and other facts. The registration periods for vehicles are valid for a specific amount of time; after this specific amount of time (the vehicle's expiration period), a renewal of the registration for the vehicle is required. The purpose of this research is to construct an automatic FC monitoring system for vehicles. The renewal brings the IoT's dates up to current. The vehicle automatically indicates the alarm's renewal date and displays that information on the LCD screen. If we forget to renew a vehicle, the RTO Offices receive its GPS location immediately.

Keywords: NON-FC Vehicles, GPS, IOT, LCD Screen, RTO Office

INTRODUCTION

The vehicle population is rapidly growing each day. A vehicle's engine produces various gases through incomplete combustion, which adds to pollution and has a negative impact on the environment. The detection and management of these gases is a crucial area of work. Although this emission from vehicles cannot entirely be avoided, it may be managed. Accidents are a common cause of death nowadays. These are important factors to keep under control, thus we have developed an idea to reduce pollution and locate accidents using GPS. We want to create an automated vehicle detecting system to address the issues mentioned above (Mahantesh B Dalawai, 2018).

The introduction of transportation has greatly impacted our everyday lives and made many of our jobs simpler. But it has the potential to ruin our lives and possibly result in our deaths due to accidents. The issue that the society is currently suffering serves as the foundation for this paper's content (SRM. ArthiShri, Special Issue- March 2018). Our environment continues to be severely impacted by pollution. Many factors might affect the environment as a result of vehicle pollution. This paper serves the goal of describing the validity of vehicle registration periods. After this specified duration (the vehicle's expiration period), a vehicle registration renewal must be done. Our system focuses mostly on the FC Date renewal that occurs automatically. We are utilising the Arduino UNO, GPS, Buzzer, LCD, and Internet of Things. The vehicle's renewal date automatically signals the alarm using a buzzer. The GPS information is then automatically updated to the IoT through the cloud, and the data can be presented in the LCD display. But, if the owner vehicle FC date is renewed, the IoT can be used to update the renewal in the Cayenne app. Referring to a reference item, please use the reference number as in (Arushi Singh)

In this paper, the entire system is controlled by an Arduino UNO microcontroller. When an emergency situation is identified, the user is notified through LCD and the Buzzer, and the vehicle owner is also made aware. Using IoT, GPS is used to send the location to the Cayenne app. In order to decrease the amount of difficulties caused by NON-FC vehicles, which are used to track and control NON-FC vehicles using GPS technology (A. Sumithra, 2019).

Under this system, normally 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. If the driver of the vehicle does not touch the IoT button, the proposed system assumes that the owner's vehicle's FC date will not be renewed within the specified time (MohannadIbrahim). If the owner presses the button, it signifies that the FC date will be renewed at that certain time. If the renewal FC date has expired, notify the owner of the vehicle via the buzzer and update the IoT with the vehicle's current position. The location of the vehicle is tracked via GPS. We are using the IoT module ESP 8266 (12E module) (Giovanni B. Fioccola).

METHODOLOGY

Fig 1 shows the block diagram of GPS control. The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable location and time

information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites This sensor is used to collect information on location of the vehicle and sends the signals to the Arduino board and the same is displayed on LCD. The development board equips the ESP-12E module containing an ESP8266 chip having Tensilica xtensa 32-bit LX106 RISC microprocessor which operates at 80 to 160 MHz adjustable clock frequency and supports RTOS. This makes the ESP8266 Node MCU even more versatile.

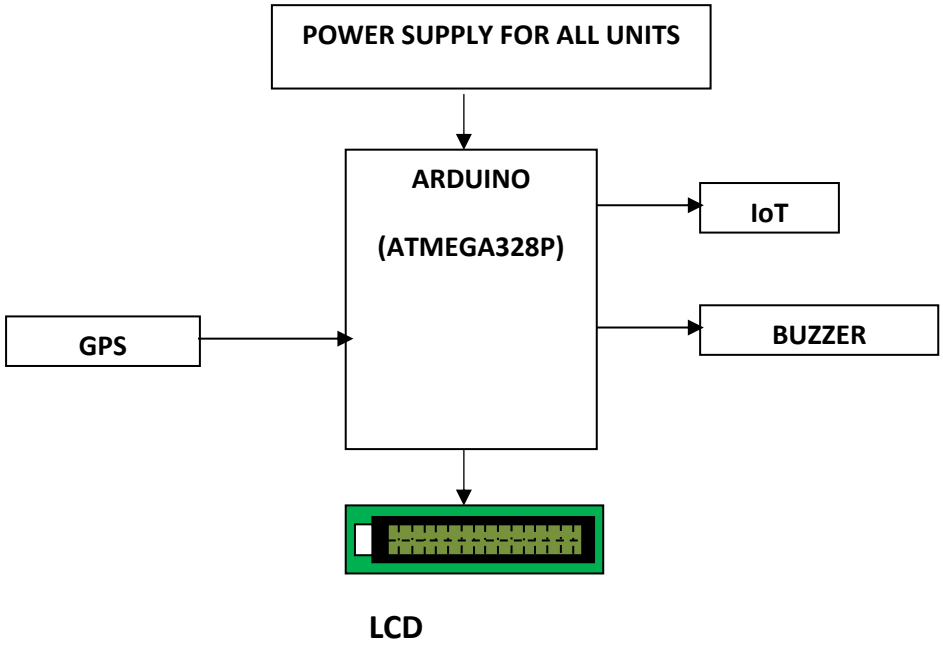

Fig 1 Block Diagram

Components and Experiments

The GPS-based vehicle tracking system described in this paper comprises several components, including a GPS sensor, an Arduino board, an ESP8266 NodeMCU development board, and an LCD display. The GPS sensor is responsible for collecting information on the vehicle's location and sending this data to the Arduino board. The Arduino board processes the data and sends it to the ESP8266 NodeMCU development board. This board is equipped with an ESP-12E module containing an ESP8266 chip, which features a 32-bit LX106 RISC microprocessor operating at a clock frequency of 80 to 160 MHz, making it highly versatile. The ESP8266 NodeMCU development board supports real-time operating systems (RTOS) and provides Wi-Fi connectivity. The LCD display is used to display the location information in real-time. By combining these components, the system is able to accurately track the vehicle's location and display it on the LCD display. Overall, this GPS-based vehicle tracking system is an effective solution for fleet management, logistics, and transportation industries (Seung Ho Kim, 2019)

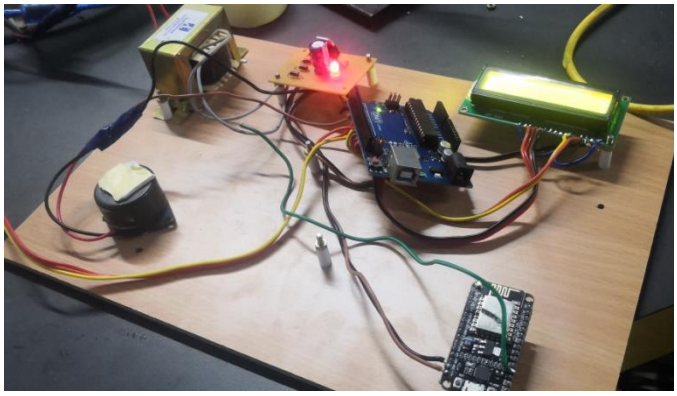

Fig 2 Components used in hardware

RESULTS AND DISCUSSIONS

This paper's design incorporates a microcontroller, IOT, GPS, an LCD display, and a buzzer. Since FC is the only person who can assess the vehicle's condition, it must be refreshed on a regular basis. Now, we refresh owner vehicle FC once each year. The FC isn't renewed by everyone, though. Using our paper in real time will let us easily resolve this issue.

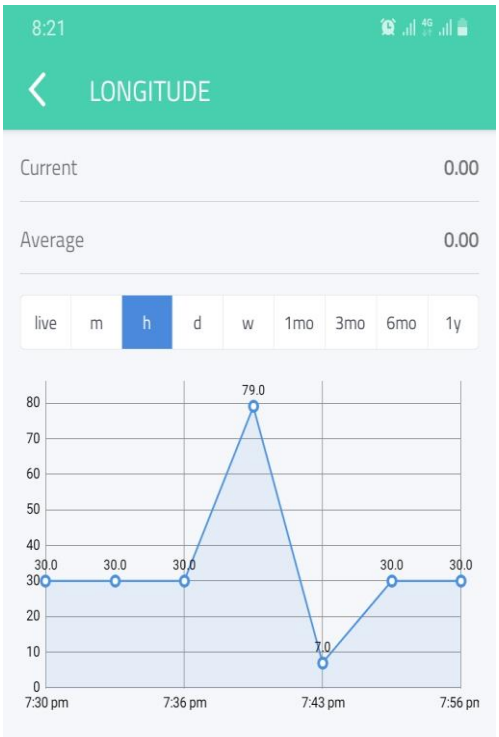

Fig 3 GPS longitude location

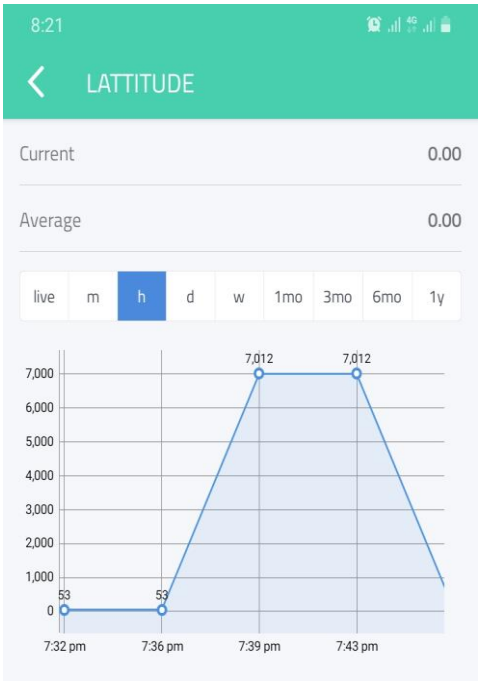

Fig 4 Latitude location

GPS sensor gathers data about vehicles location, captures the longitude and lattitude measures, and displays the results on the Cayenne app. This paper might serve as a reminder to the owner to renew his FC. The vehicle will be shut off if the owner doesn't renew his FC. With the message that is received from the IoT module, the RTO can then quickly locate the polluted vehicle

CONCLUSION

The idea of identifying the FC renewal and alerting the driver to it is put into practise. Over the past two decades, pollution has increased, which has resulted in a number of environmental issues. There will be a sizable population that do not take vehicular pollution seriously, which has already led to a number of environmental issues like the thinning of the ozone layer and other issues. So, this system will be very helpful in reducing this issue. Owing of our busy lives, pollution management requires the use of an automated system.

FUTURE SCOPE

This study is expanded by integrating GPS with an IOT module and notifying the user of the location of the closest service station.It is possible to keep track of the system's pollution level using a server and database, and if the pollution level alarm is disregarded, control measures against the owner may be implemented.

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Cite this article:

N Kannammal, S Dharshini, Microcontroller Based Automatic FC Date Monitoring and Controlling System, Journal of Multidimensional Research and Review (JMRR), Vol.3, Iss.4, pp.14-19, 2023