VEHICLE MONITORING SYSTEM WITH TFT DISPLAY

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Abstract – Recently TFT-LCD became a predominant front of panel display technology.Most of the conventional panels are being replaced by the TFT-LCD panel display and as a consequence of the TFT-LCD market growing rapidly.we present a paper using the TFT display about the monitoring of the vehicles.On this paper we described the features of the vehicles such as Speed,distance calculation of the vehicle nearing to the vehicle ,Camera interface for the parking facility,fuel injection,action of the indicators and the tyre pressure monitoring.Instead of using other dispalys for the displaying purpose TFT display will be more efficient than others.This will be fitted to any four wheeler vehicles there by it will be more efficient for the parking, detecting the vehicle that are nearing to the object (vehicle),analysing the features of speed,fuel level and fuel injection action of the indicators and more effectively by detecting the pressure of the tyre accidents can be avoided using the Tyre pressure sensors.The python language is used for the software setup.

Keywords:- TFT-LCD,TPM,python

1.INTRODUCTION

The main aim of this paper is to monitor the basic functions of the vehicles. By using some sensors and interfaces such as camera. For that we are using Raspberry pi 3 as a hardware tool and python language for software handling and the output wil be displayed with Thin Flim Transistor(TFT).The TFT display will be used for providing better color reproduction and wider more accurate viewing angle and it is attached to the each pixel. It also provides less energy consumption, visibility sharper in other words has super quality, physical design, response time and less eye strain etc.. In this paper outputs such as pressure monitoring of the tyre, distance measuring of the vehicle appear nearing to the object(vehicle 1),the amount of fuel to be injected. In addition to that speed of the vehicle will be detected and the action of the indicators will be displayed on the screen. with this the camera interface also included for viewing the back view of the car for the parking facility and for other purpose for turning and reverse actions to be performed. The temperature sensor also added to verify the temperature to avoid the battery to be overheated.

2. EXISTING SYSTEM

The screens used for the displaying purpose in the vehicle. For example in cars the screens used for the displaying purposes will be of with some quality can be upgraded and that will be used for only viewing purpose. The touch availability also available for the screens but with some poor quality and that can be featured with only credentials available. The screens used for this vehicles can also be connected with smartphones so that various features of GPRS availability and location tracking can be done. But with low quality, this can be overcome by using TFT LCD for betterment

3. PROPOSED SYSTEM

The advantages of TFT LCD are as follows: less energy consumption, visibility is sharper in other words has superb quality, physical design, response time, and less eye strain etc…with every great product there are few disadvantages associated, such as, cost and viewing angles. Ips LCD, which is a variant of (active matrix) TFT LCDs, further improves display technology by providing better color reproduction and a wider, more accurate viewing angle. IPS TFT LCD technology is widely used for high performance computers, laptops, tablets and smartphones. LCD stands for liquid crystal display. TFT is a type of LCD with a thin film transistor attached to each pixel. All computer LCD screens are TFT since early 2000s, older ones had slower response times and poorer colour. Cost is now very good, power consumption is fairly good but dominated by the backlight. A thin film transistor liquid crystal display (TFT LCD) is variant of a liquid crystal display (LCD) that uses thin film transistor(TFT) technology to improve image qualities such as addressability and contrast.

4. BLOCK DIAGRAM
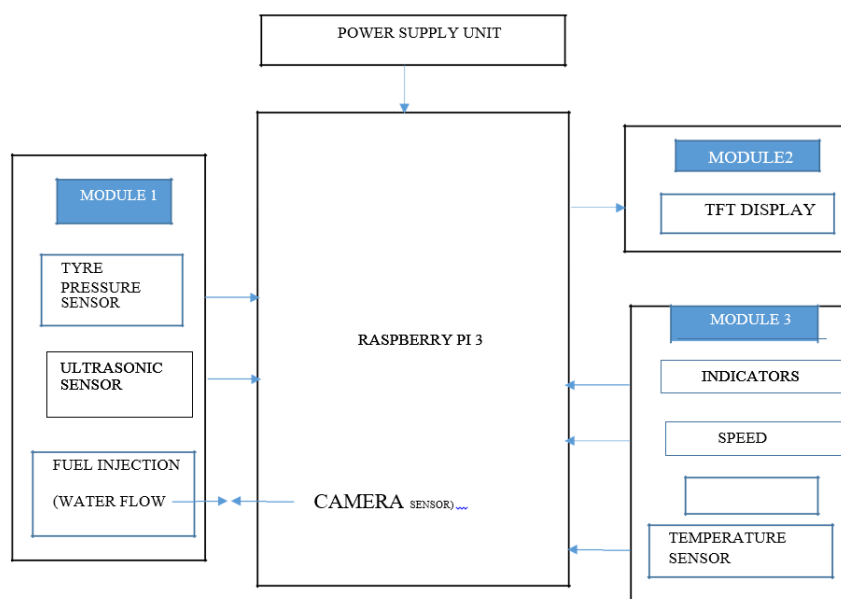
5. BLOCK DIAGRAM EXPLANATION

In this paper we designed vehicle monitoring in order to improvise the facilities in the vehicle by adding the features of distance calculation of the vehicle appearing near to the object and in order to avoid the accidents due to lowering the pressure of the tyre and with some ordinary features already available. The paper will be based on the vehicle monitoring with display of Thin Film Resistors (TFT).The hardware Raspberry pi 3 used for this paper and with some working module sensors. The sensor used in this paper are ultrasonic sensor for measuring the distance of the vehicle appear nearing to the object(vehicle 1),pressure sensor for monitoring the pressure, speed will be displayed and measured by measuring the rpm, injection of the fuel will be measured by using the water flow sensor for injection of the fuel, for the parking facility the back view of the vehicle will be captured as several frames, the action of the indicators will be displayed.

5.1 TYRE PRESSURE SENSOR

A tire pressure monitoring system is an electronic system designed to monitor the air pressure inside the pneumatic tires on various types of vehicles. TPMS report real time tire pressure information to the driver of the vehicle, either via a gauge, a pictogram display, or a simple low pressure warning light. This can be done by two methods Direct method and Indirect method. Direct TPMS uses pressure monitoring sensors within each tire that monitor specific pressure levels not just wheel revolution data from the anti-clock brake system. A direct tire pressure monitor usually sends all of this data wirelessly. Indirect TPMS works with your car's antilock braking system's ABS wheel speed sensors. If a tire's pressure is low, it will roll at a different wheel speed than the other tires. This information is detected by your car's computer system, which triggers the dashboard indicator light.

5.2. ULTRASONIC SENSOR

As the name indicates,ultrasonic sensors measure distance by using ultrasonic waves.The sensor head emits an ultrasonic wave and receives the wave reflected back from the target.ultrasonic sensors measure the distance to the target by measuring

the time between the emission and reception.ultrasonic sensors,these compact sensors provide enhanced flexibility for areas with limited space and are excellent for standard packaging and assembly applications.for example ,use a type of sonar.Using echo times from sound waves that bounce off nearby objects,the sensors can identify how far away the vehicle is from said object,and alert the driver the closer the vehicle gets.The output of HCSR04 ultrasonic sensor is digital.It has four pins,two of them is forsupplying power to it,one is for sending an echo signature to it and one is for getting output from it.


5.3. FUEL INJECTION (WATER FLOW SENSOR)

In this paper for the fuel injection we used water flow sensor.It is used to determine the flow rate of fuel entering the fuel injection internal combustion engine.with sensor's inputs an engine's ECU determine the flow rate of intake fuel. Flow sensors are more appropriate than volumetric flow sensors for determining the quantity of intake fuel in tank.Water flow sensor consists of a plastic valve body,a water rotor,and a hall-effect sensor.When fuel flows through the rotor,rotor rolls.Its speed changes with different rate of flow.the hall-effect sensor outputs the corresponding pulse signals .We can measure the flow by the following, Flow is the volume of fluid that passes in a unit of time.In water resources, flow is often measured in units of cubic feetpersecond(cfs),cublic meters per second(cms)gallons per minute(gpm) or other various units.

5.4 RASPBERRY PI

The raspberry pi is a series of small single-board computers developed in the united kingdom by the Raspberry Pi Foundation to promote teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated ,selling outside its target market for uses such as robotics.It does not include peripherals and cases.However,some accessories have been included in several official and unofficial bundles.The raspberry pi board comprises a program memory(RAM),processor and graphic chip ,CPU,GPU,Ehernet port,GPIO pins,Xbee socket,UART,power source connector.And various interfaces for other external devices.It mainly include SD card and containing Linux OS,Us keyboard,monitor power supply and video cable. The Raspberry Pi comes with two models ,they aremodel A and model B. The raspberry pi model A board is designed with 256 MB of SDRAM and model B is designed with 51 MB. Raspberry pi is a small size pc compare with other PCs. The normal PCs RAM memory is available in gigabytes.But in raspberry pi board, the RAM memory is available more thn 256 MB or 512 MB.The Central processing unit is the brain of the raspberry pi and it is responsible for carrying the instructions of the computers through logical and mathematical operations.The Ethernet port of the raspberry pi is the main gateway for communicating with additional devices.UART (Universal Asynchronous Receiver/Transmitter is a serial input &output port.That can be used to transfer the serial data in the form of text and it is useful for converting the debugging code.
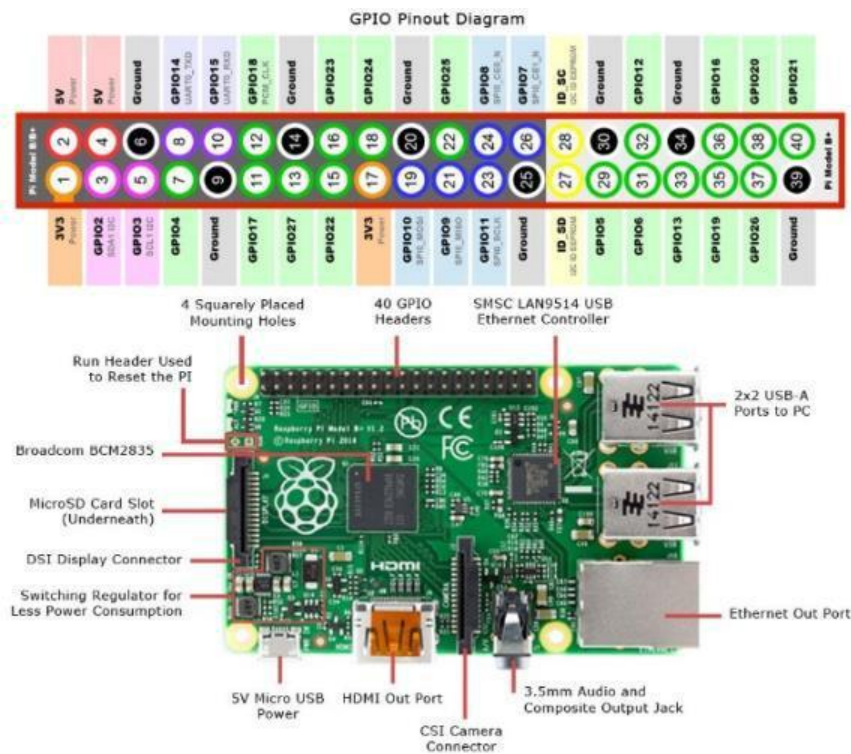
5.5 INDICATORS

A vehicle has several has several signalling devices such as indicators,brake,light,hazard warning light, headlights ,reversing light and the vehicle horn.These signalling devices are used by a driver to communicate to other road users what they intend to do.They help drivers "read the road".Signal lights have an important safety function. They demonstrate declaration and a change in direction of the vehicle and make the vehicle more visible to other road users when it is dark or during poor visibility.The indicator is connected to the steering wheel of the four wheeler or the handle of two wheeler.It sense the vehicle movement thnrough this. It consist of 4 IR sensors.That transmiters attached to the handle or steering wheels send the signals to these IR sensors which senses the current position of them.Sensors send the signal to the operational amplifiers are connected to them.The signal gets converted to the dihgital signal and automatically led lights ON or OFF accordingly.

5.6 SPEED

In this paper we used groove coupler for the speed detection.Groove coupler is the sensor used for the measuring of speed.Imported Groove optical coupling sensor has a width of 5mm.Good signal and waveform with a strong driving ability for more than 15 mA. Equipped with a fixed bolt hole, easy install.Use the LM393 wide voltage comparer.

5.7 CAMERA
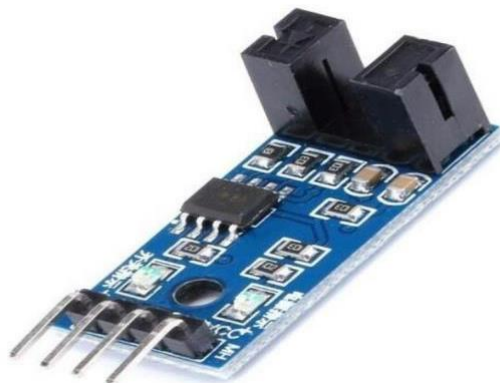
Here we use the web camera for the purpose of viewing the back view of the vehicle and we can use that for parking facility and also for the reverse driving facility.The term webcam is a combination of "web" and video "camera".The purpose of webcam is not surprisingly, to broadcast video on the web.webcams are typically small cameras that either attached to a user's monitor or sit on a desk.The most webcam connect to the computer via USB,though some use a firewire connection.webcams

typically come with software that allows the user to record or stream the video on the web.If user has a website that support streaming video, other users can watch the video stream from their web browsers.

5.8 TEMPERATURE SENSOR

Temperature sensor is a device to measure the temperature through an electrical signal it require a thermocouple or RTD(Resistance Temperature Detectors).The working base of the sensors is the voltage that read across the diode .The LM35 series are precision integrated circuit temperature devices with an output voltage linearly proportional to the centigrade temperature. These sensors are effectively two identically diodes with temperature-sensitive voltage vs current characteristics that can be used to monitor changes in temperature.The output of this sensor changes describes the linearity comparative to the Celsius temperature.The operating voltage range of this LM35ranges from 55 degree Celsius to +150 degree Celsius and it has low self-heating.

CONCLUSION

The vehicle monitoring system using Raspberry Pi platform with TFT display will be performed with python language.we brought up our paper to a product level with the features of speed detecting,distance calculation of the vehicle appear nearing to the vehicle,fuel injection,Tyre pressure monitoring,action of indicators,camera for parking facility and temperature measuring for the safety of the battery.

REFERENCES

1. Aher S.S, Prof. Kotaker.D."Monitoring Fuel And Vehicle Tracking", (Ijeit) Journal, Volume 1, Issue 3.
2. Yen-Yen Chen, Chai-Hung Chein."Fuel Consumption System", Journal of Computer and Communication.
3. Berkovic M.,Mustafic I.,Strucni Bilten-Ipi"Tyrepressure Monitoringsystem" No. 11,2010.
4. Wu, Liji,Xiangmin Zhang, Xiao Yu,Xuyang Ding, Aand Chaojun Chi."A Battery-Less Tire pressure Monitoring system."In Connected vehicles And Expo9iccve), 2012 International Conference.Ieee, 2012