

## 4 Stroke Engine Quality Manager

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**Abstract**— In this project we are conduct to analyses engine parameters for engine quality analysis. We are using temperature sensor, vibration sensor, smoke detector and oil level sensor for detecting these parameters. By following these analyses. we can improve life of our engine and decrease air pollution causing by dangers gases released by vehicle In this project we can't require the any other human hazardous to checking Engine Quality. We are normally use human eye and hear for checking the quality but in this system we are use sensors for getting accurate reading. Human only watch that reading and find out the problem which in four stroke Engine. And this system gives the protection of human body.

**Key words:** 4 Stroke Engine, Temperature Sensor

### I. INTRODUCTION

A four-stroke engine (also known as four cycles) is an internal combustion engine in which the piston completes four separate strokes when turning a crankshaft. A stroke refers to the full travel of the piston along the cylinder, in either way. The four separate strokes are termed presently.

By using this project module we can analyzed the qualities of engine parameter, CO<sub>2</sub> level in smoke, vibrations in engine etc.

We can check the quality of engine by having the noise of engine manually, Any other automated system for assuming engine Performance is not available, To purchase old vehicles, one must check for the quality of engine, In this system we are making any four stroke engine quality checking automatically, which based on embedded system, We are using ARM controller for getting data from engine and send to PC.

### II. HISTORY

#### A. Microcontroller:

As our project is on data transfer, so we require a controller which have high frequency, high rate of data transmission and most importantly it should possible to interface more than one USB port.

So, we have selected the ARM7 microcontroller which is best option for our project.

#### 1) Features:

- 16/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
- 8 to 40 kB of on-chip static RAM and 32 to 512 kB of on-chip flash program memory. 128 bit wide interface enables high speed 60 MHz operation.
- In-System/In-Application Programming (ISP/IAP) through on-chip boot-loader software. Single flash sector or full chip erase in 400 ms and programming of 256 bytes in 1 ms.

#### 2) Types of Sensors:

##### a) Vibration Sensor:

Vibration sensor is used originally as vibration switch because of its high sensitivity. it is sensitive to environment vibration. Generally used to detect the ambient vibration strength. When module unable to reach the threshold in shock or vibration strength, DO port output go on high level and when external vibration strength exceeds the threshold, DO port output gets low level.

##### b) Temperature Sensor:

The LM35 series are Nicety integrated circuit temperature sensors, whose output voltage is linearly proportional to the Celsius temperature. The output voltage varies by 10mV in response to every 0°C rise/fall in ambient temperature that is linear +10.0 mV/ 0C scale factor. The LM35 is rated to operate over a -55 ° to +150 °C temperature range. It has operates from 4 to 20 volts

##### c) Oil Level Sensor:

Level measurement can be performed via ultrasonic or sonic technology. Ultrasonic class measurement devices basically echo sound waves for detection of liquid level. They are usually work over the frequency range between 20 kHz to 200 kHz.

##### d) Oil Quality Sensor:

A color sensor is actually a good useful device. Now in the age where autonomous vehicles are being developed that can run on their own, driverless cars, there has to be a way to be capable to detect colors at places such as red stop signs and of course traffic lights, green to betake and red to stop.

### III. SYSTEM DESIGN

#### A. Block Diagram

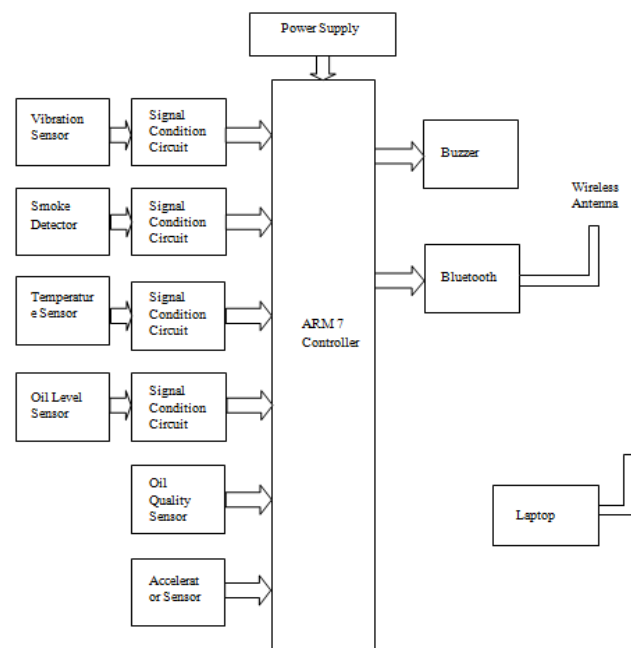


Fig. 1: System Design

### B. Methodology:

- In this the parameters like vibration, CO and temperature are sensed with the help of respective sensors .These sensed signals are sent to Microcontroller.
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- All parameters are sending to PC and stored in a memory location. The parameters are graphically displayed on the PC with the help of Mat Lab software.

### IV. COMPONENTS USED

#### A. Hardware Requirement:

- ARM7 processor
- Power supply
- WSN module
- Driver unit
- Smoke sensor
- LM35 Temp. Sensors
- Vibration sensor

#### B. Software Requirement:

- Kiel C cross compiler IDE
- Flash magic programmer tool
- Eagle hardware design tool
- Mat lab(representing pot)
- Languages:
  - Embedded C

### V. ADVANTAGES

- System is very easy to use and most preferable.
- Bluetooth used to send information in within second time.
- Accuracy is Maintain.
- System analysis is shown in graphical form so it more easy to user.

### VI. LIMITATIONS

#### A. Problems Faced:

- Customers complain about engine Temperature.
- Any other automated system for assuming engine performance is not available.

#### B. Reasons:

- Vehicle running on overload / continuous running conditions are the basic reasons for engine temperature.
- Improper and un-timely maintenance are the main reasons for bad performance of vehicle.

### VII. APPLICATIONS

- Engine Manufacturing Company.
- Motor Garage system.
- Engine Test bench.
- Serves Centre.

### VIII. CONCLUSION

By using this project module we analyze the various changes in engine parameter. by detecting change in temperature using temperature sensor, Also the defect produce due to bad quality of oil is prevent by oil quality sensor. Using smoke detector we analyze the change in CO2 level in smoke. All above analysis we get quality of four stroke engine. With the help of this analysis we can improve quality and life of engine with the help of mechanic.

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