Abstract

The functions of odometer are to determine the distance of vehicle and usually for time of periodic inspections of engine lubricants replacement in a vehicle [13]. For owner who has many vehicles, oil inspection vehicle replacement should be noted. Because it can makes fatal damage to the vehicle so that endanger passengers. Therefore an integrated system is made to give early warning of lubricants replacement using microcontroller.

The system is divided into two parts; the system at the vehicle which consist of odometer prototype, microcontroller and infrared transceiver, and the second system at garage which consist of limit switch button, infrared transceiver, microcontroller, TTL to serial converter, and computer. These two systems are tested using several combinations of observation parameters. The observed parameters are consisting of data size in byte, angle, distance between the system and obstacle. The sent data sizes are 1 byte and 2 byte, these size represent value of odometer between $0 - 65535$ KM. The angles set when takes the data between the systems are $0°$, $5°$, $10°$, $15°$, $30°$, $45°$, $60°$ and $90°$. The combination of the distances which tested between system are 10 cm, 50 cm, 100 cm, 300 cm, 500 cm, and 700 cm. For the obstacle used in the experiments are glass with 0.5 cm of width which is divided into 3 parts (without window film, with window film of 60% of darkness degree, with window film of 80% of darkness degree), the width and the darkness of glass, assumed if the systems inside a car and when it send data, the systems stunted by car windshield

The test result showed that the angles smaller than $30°$ gave correct time response and data validity sent by 2 systems is match. Meanwhile, angle larger than $30°$ gave error on the data or the data is not received by the system in garage. 2 byte data transmission need longer time of 1 millisecond than 1 byte data transmission. On the distance and obstacle parameters, time response and data validity are relatively not affected but for distance more than 700 cm, the data is not received by system in garage.

Key word: *odometer, microcontroller, infrared*