

LPG Leakage Control Using SMS through SIM800L with MQ-2 Sensor and Stepper Motor Based on Arduino UNO

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Abstract

Currently LPG (Liquid Petroleum Gas) in the form of methane / butane widely used by society. So that kerosene that used to be often used has been abandoned by society and replaced by LPG. By using this LPG many benefits can be obtained by society. For instance LPG usage is much more efficient. But there are also shortcomings that we must consider when using this LPG is in terms of security. This is because the gas is flammable so it can cause a fire / explosion. Therefore the LPG leakage controller was designed using SMS via SIM800L with MQ-2 sensor and Arduino UNO stepper motor. This tool consists of several series of sensor circuit, an arduino UNO minimum system, stepper motor driver circuit, SIM800L circuit and alarm circuit. From the research results obtained, LPG leakage controller is able to detect leakage starting from the sensor output value 32 - 553.

Keywords: MQ-2 Sensor, Arduino UNO, Stepper motor, SIM800L, Buzzer

1. Introduction

The rise of fires and accidents caused by leaks and the explosion of LPG (Liquid Petroleum Gas) tubes has recently become a frightening thing for most of the LPG users. One of the early prevention systems that have been made is a tool

using the MQ-2 sensor and buzzer [1]. The working system of the device is the buzzer will sound if the MQ-2 sensor detects LPG leakage [2]. The use of early prevention tools in this study is less effective when the house is empty. Although the buzzer is ringing, no one knows it leaks LPG so that an additional warning giver is required to inform the landlord immediately when LPG leak occurs. The author has added a warning tool in the form of SMS using SIM800L (Early Warning System) and stepper motor as a controller so it is very good in additional warning if LPG leak occurs. If this system detects LPG leakage it will automatically give a sign of alarm, SMS (Short Message Service) and automatically turn the regulator off.

2. Material and Methods

LPG leakage control using SMS through SIM800L with MQ-2 sensor and stepper motor based on arduino uno shown in Figure 2.1

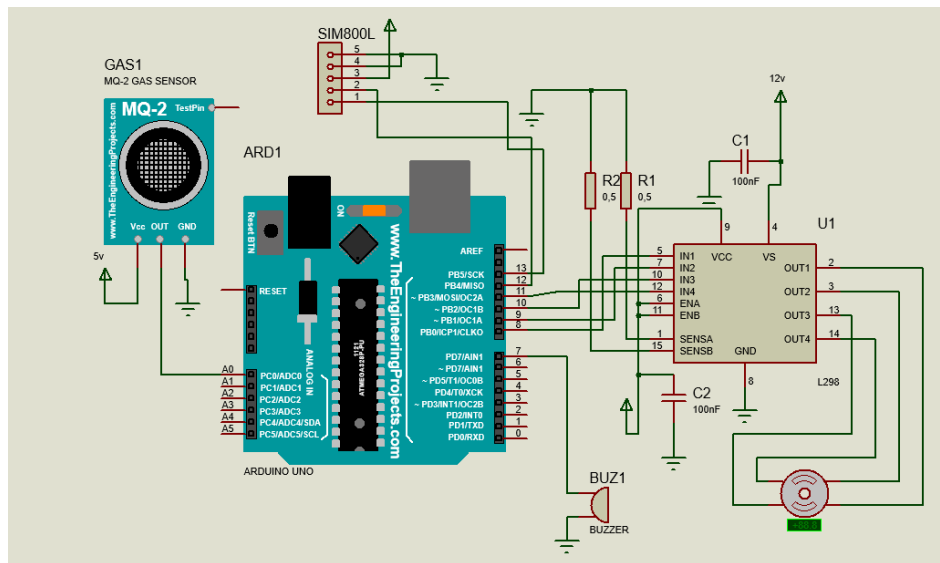


Figure 2.1. Overall series of monitoring and control of LPG leak

In this circuit the device tool uses Arduino UNO [3] port A.0 as the output receiver provided by the MQ-2 sensor. The next port uses port 12, 13 that is port 13 (RXD) and port 12 (TXD) this port is used to send SMS to destination number that is using SIM800L [4]. Port 7 as the input of the buzzer that serves as an alarm and port 8, 9, 10, 11 as a motor driver port that serves to control the stepper motor. When the MQ-2 sensor starts detecting LPG leakage then the sensor will send data in the form of analog data sent to port A.0 which will be processed into digital data by Arduino UNO. Data processed in such a way by Arduino will later be sent to Buzzer as alarm, SIM800L as sender SMS to destination number and motor driver as motor controller to close gas regulator [5].

3. Results and Discussion

The design LPG leakage control using SMS through SIM800L With MQ-2 sensor and stepper motor based on Arduino UNO is done by finding the result of measurement in the form of change of output value detected by MQ-2 sensor. Data obtained from this test when the sensor is active but the gas has not been detected is shown in Figure 3.1.

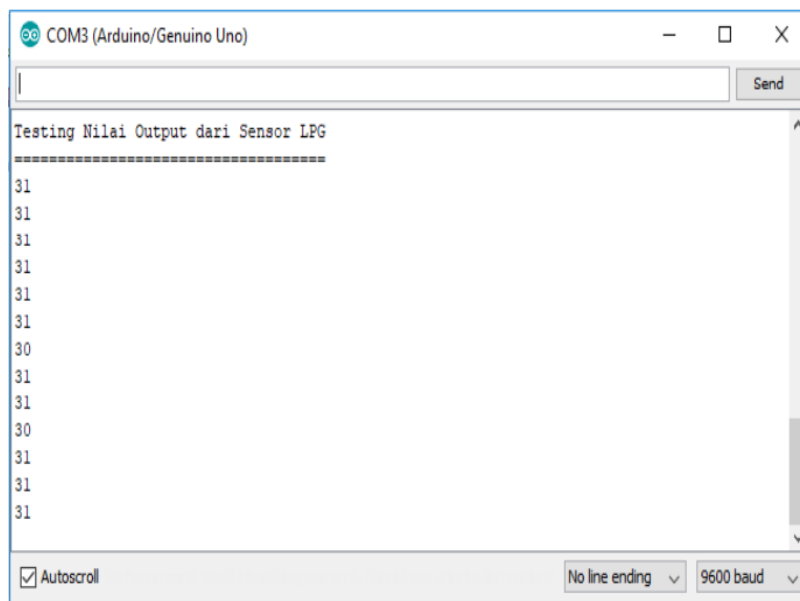


Figure 3.1 Results data at the time of the sensor has not detected LPG.

Furthermore, when the MQ-2 sensor detects an LPG leak, the data in Figure 3.1 changes as shown in Figure 3.2.

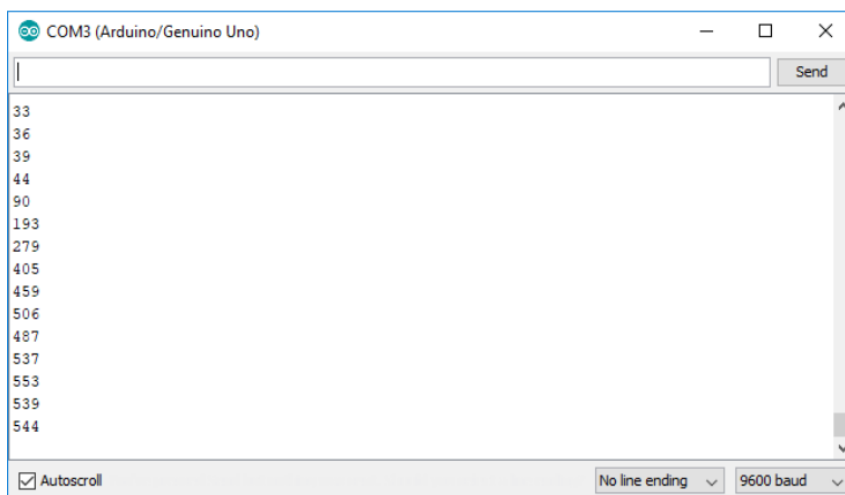


Figure 3.2 Data on the result when the sensor detects LPG.

4. Conclusion

From the research result of LPG leakage control using SMS through SIM800L with MQ-2 sensor and stepper motor based on Arduino UNO. This gas leak detector detects starting from the sensor output value of 32 - 553.

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