

Extended Abstract

SMARTEST GAS LEAKAGE SENSOR (SGLS)

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Abstract

Natural gas is one of the world's leading sources of energy and it is highly flammable. Gas leakage and its related accidents cause enormous loss of property and valuable lives. It also causes environmental hazards which are harmful to mankind for a long period. Consumption of natural gas for domestic and industrial usage takes more than 50% around the globe. Domestic fires and industrial gas explosions have been increasing in recent years. A systematic state-of-the-art device with artificial intelligence would be good to alert or detect a gas leakage on time to save many lives and unwanted accidents. To achieve the above-stated goals, the invention of a scientific and artificial intelligent device, the **Smartest Gas Leakage Sensor (SGLS)** is invented. It is an Arduino device which can detect flammable gas from gas lines and combustible gases. The sensor will give an audible alarm to alert when dangerous gas leakage is detected. The detection will be connected to a smart mobile phone via Bluetooth. This device is eco-friendly, economical and very much related to the artificial intelligent cluster. The **SGLS** also comes in a compact size. Alerting/alarming a dangerous accident can let us prepare ever-ready safety measures to save lives and properties. Accidents caused by gas leakage is big destruction for human and also the environment. Since gas is a non-renewable source of energy, using it safely and economically will delay the depletion of this natural resource. This is also an important prerequisite for the survival of mankind and the ecological system. This invention can be an essential device for the natural resource to run for a longer time and for the betterment of humans in general across the globe.

Keywords: Artificial intelligence, detector, hazardous, leakage, energy

Introduction

Natural gas is one of the world's leading sources of energy and it is highly inflammable. Gas leakage and related accidents cause enormous loss of property and valuable lives. It also causes environmental hazards which are harmful

to mankind for a long time. Consumption of natural gas for domestic and industrial usage takes more than 50% around the globe. Domestic fires and industrial gas explosions have been increasing in recent years.

Objective

A systematic state-of-the-art device with artificial intelligence would be good to detect and alert a gas leakage on time to

save many lives and unwanted accidents. To achieve the above-stated goals, the invention of a scientific and artificial

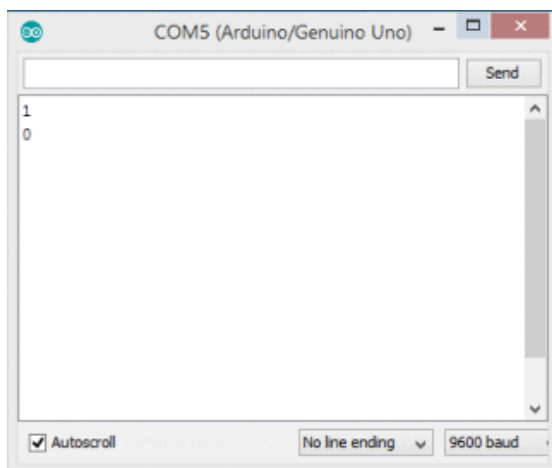
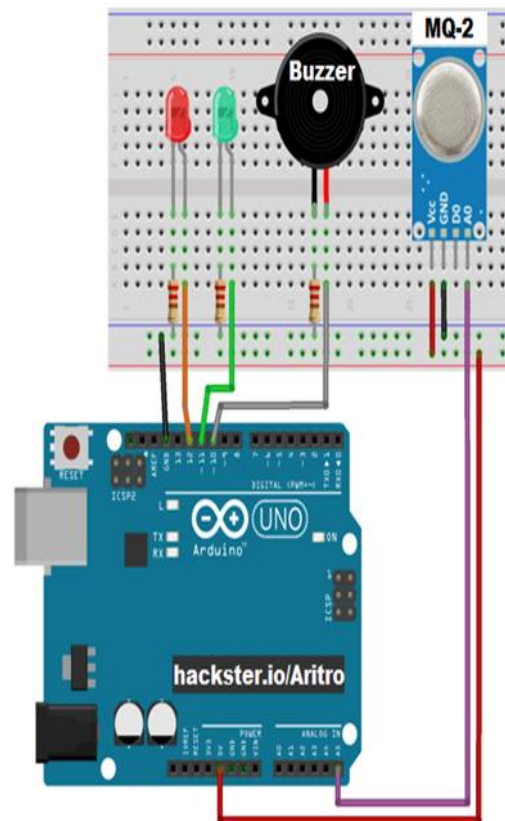
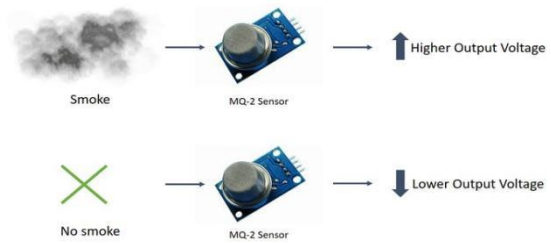
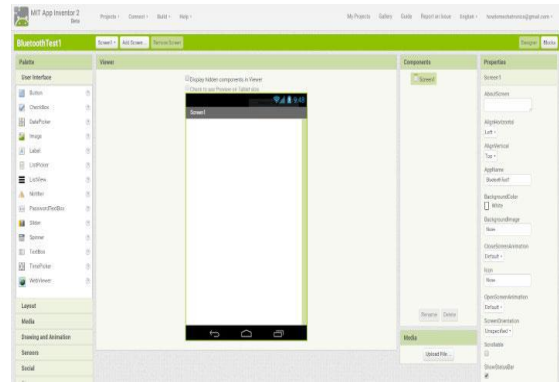
intelligent device, the **Smartest Gas Leakage Sensor (SGLS)** is invented.

The Invention

The invention is an Arduino device which can detect flammable gas from gas lines and combustible gases. It is a small compactable device which will be placed or located within a metre of the LPG (Liquified Petroleum Gas). The sensor will give an audible alarm to alert when dangerous gas leakage is detected.

Methodology

The detection will be connected to a smart mobile phone via Bluetooth. How does it work? The MQ-2 smoke analogue output voltage causes smoke. When the smoke reaches a certain level, the buzzer will make a sound and a red LED will turn on. If the output voltage is below the threshold level, a green LED will be on. The MQ-2 smoke sensor is sensitive to flammable gases such as LPG, Butane, Propane, Methane, Alcohol and Hydrogen. The output can be an analogue signal (AO) that can be read with an analogue input of the Arduino or a digital output (DO) that can be read with a digital input of the Arduino. The MQ-2 sensor has 4 pins – Wiring to Arduino Uno, Analog Pins, Digital Pins, GND and VCC (5V). The sensor will give an audible alarm to alert when dangerous gas leakage is detected. The detection will be connected to a smart mobile phone via Bluetooth.



The collaboration of artificial intelligence comes when the usage of Smartphones is involved.

Tools and Parts needed in order to complete the SGAS are:

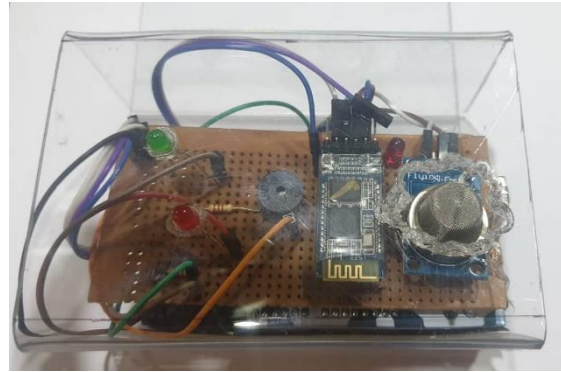
- a) Bluetooth Module HC 05
- b) Arduino
- c) LED
- d) 220Ω Resistor
- e) Android device
- f) Arduino IDE
- g) MIT Inventor

There are three main parts to this SGAS. An Android smartphone, a Bluetooth transceiver, and an Arduino. HC 05 works on serial communication. The Android app is designed to send serial data to the Arduino Bluetooth module when a button is pressed on the app. The Arduino Bluetooth module at the other end receives the data and sends it to the Arduino through the TX pin of the Bluetooth module (connected to the RX pin of the Arduino). The code uploaded to the Arduino checks the received data and compares it. If the received data is 1, the gas leakage detected turns ON. On the other hand, the signal turns OFF when the received data is 0.

Benefits and Recommendation

Since gas is a non-renewable source of energy, using it safely will delay the depletion of this natural resource. Alerting/alarming a dangerous accident can let us prepare for precautions to save lives and properties. This is also an important prerequisite for the survival of mankind and the ecological system. This invention too can be an essential device for the natural resource to run for a longer time and for a benefit of humans.

This device is highly recommended for domestic usage and industrial sectors. This smart device is eco-friendly and economical. It can be safely and easily installed. The SGLS also comes in a compatible size and is easy to handle.



Cost of the Device

Capital - RM150 per device

Selling price – RM200 per device

Laboratory Testing

Our team has sent the device to SIRIM Berhad for testing and is currently awaiting their approval. SIRIM is a premier industrial research and technology organisation in Malaysia, wholly owned by the Minister of Finance Incorporated. SIRIM is mandated as the machinery for research and technology development, and the national champion of quality.

Conclusion

Accidents caused by gas leakage is big destruction for human and the environment. This invention is timely since the number of gas leakages increases day by day. It's an invaluable invention for the betterment of mankind across the globe in a long run.

Acknowledment

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