

## Cloud connected smart home gas cylinder platform based wifi control

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### ABSTRACT

The aim of this work is to protect our home asserts from any kind of hazards. The proposed work is used to detect the leakage of gas through a gas sensor and measures the weight of cylinder through load cells. The real time data and informations are stored in cloud for further retrival of information in future. Based on weight of the cylinder the amount of gas availibale and due date to change new cylinder may also be known. The survey was made to examine the existing work in security system and its applications.

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## 1. INTRODUCTION

The cylinder usage has increased gradually by all the peoples nowadays. While using first of all the safety is very important. In order to ensure the reliability and safety aspects the proposed work was discussed in this paper. This work will give more important on safety of human beings. Babuprasanth in [1] discussed in detail about the smart gas leakage detection concept in detail. Ruqsar et al [2] suggested elaborately the protection system using advanced technology internet of things. Shopan et al [3] proposed the concept regarding home automation. Through IoT the equipments available in the home can be easily controlled without any physical contacts. Patil et al [4] discussed about the advancement in the kitchen using internet of things. Pooja et al [5] developed a new system related to home safety using recent technologies like IoT, Wifi and cloud. Santhosh Krishna et al [6] introduced new type of robot that works on the concept of cloud which has wide applications on industry. Ayyar et al [7] suggested the method of protection of cylinder with the help of cloud technology. Anandhakrishnan et al [8] proposed a new gas monitoring system based on IoT. Sharmain [9] developed a multipath system for wireless system. Nag and Sarvagya [10] discussed about 5G wireless systems. Marokar and Zade [11] discussed about the signal transmission systems.

## 2. SOFTWARE USED

Energia Platform and SWD Debugger are preferred for this work.

```
#define BLYNK_PRINT Serial // Comment this out to disable prints and save space #include <SPI.h>
#include <WiFi.h> #include <BlynkSimpleTI_CC3200_LaunchXL.h> #include <Wire.h> #include
<SimpleTimer.h> #include "Adafruit_TMP006.h" #include <Servo.h> /*-----
-----*/ // #define LOADCELL_CHECK char ssid[] = "hazardsense"; char
pass[] = "hazardsense"; char auth[] = "8092655e0a0b4f2b8abf8f2790cb6144"; // student char email_id[] =
"mashwini1995@gmail.com"; // user id char vendor_id[] = "mashwini1995@gmail.com"; // vendor id.
```

### 3. HARDWARE DESCRIPTION

The precautionary measures are (i) Closes the gas valve (ii) Opens the air ventilation (iii) Shuts-off the home electricity (iv) to prevent electrical sparks (v) Provides a loud local alarm to alert neighbours (vi) Sends a smart phone alert to the owner (vii) Waits for the gas concentration to return to normal. CC3200, ARM cortex-M4 WIFI Microcontroller. The parts of the hardware are External Flash Memory, LPG gas level sensor, Load cell, 24-bit ADC, Infrared temperature sensor, Fire sensor, AC Relay circuitry, Servomotor, DC fan mechanism, Fire sprinkler DC motor, 6v Battery, Notification LEDs and Loudspeaker.

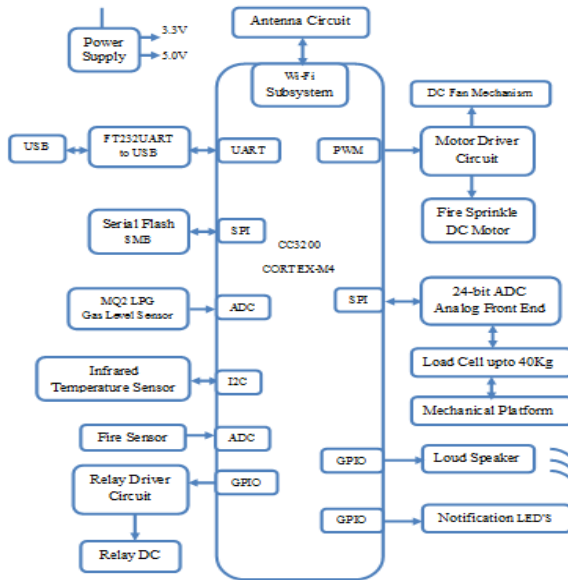


Figure 1. Block diagram

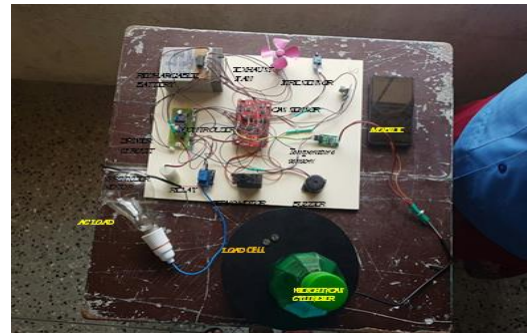


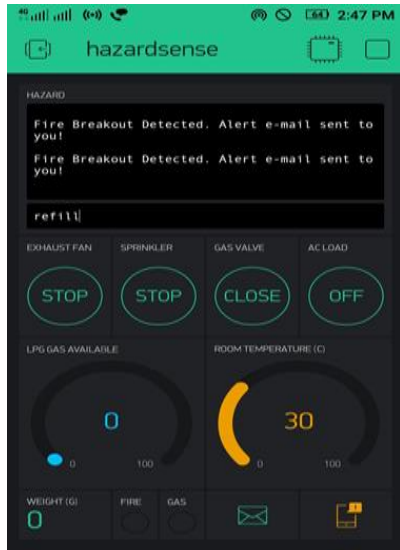
Figure 2. Hardware kit



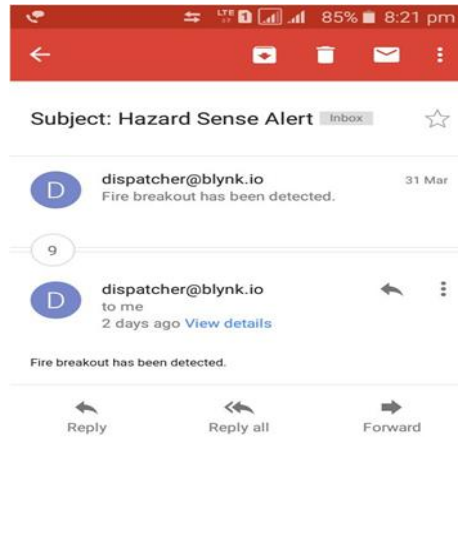
Figure 3. Initial condition



Figure 4. Firing sensing alert



(a)



(b)

Figure 5. (a) Firng sensing alert, (b) Shows that the fire breakout has been detected by fire Sensor and intimated to owner through email

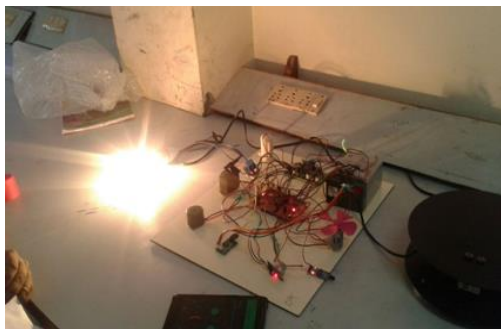


Figure 6. Before gas sense detection

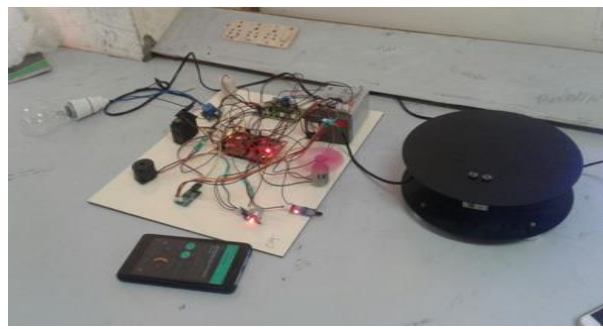


Figure 7. After gas sense detection

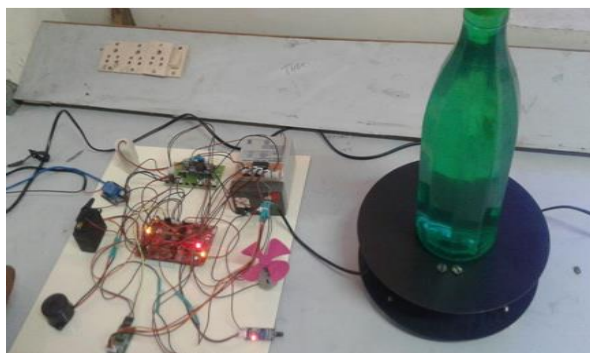


Figure 8. Weight sensing through load cell



Figure 9. Notification of load in percentage from BLYNK application

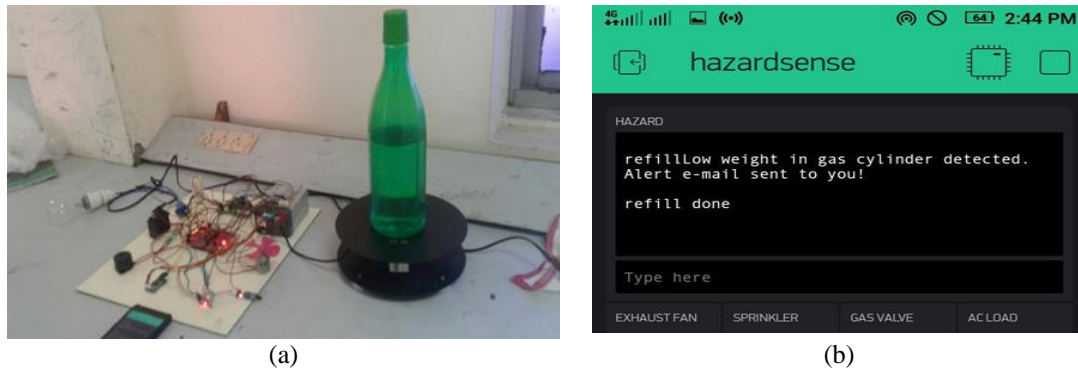


Figure 10. (a) and (b). Refilling of cylinder

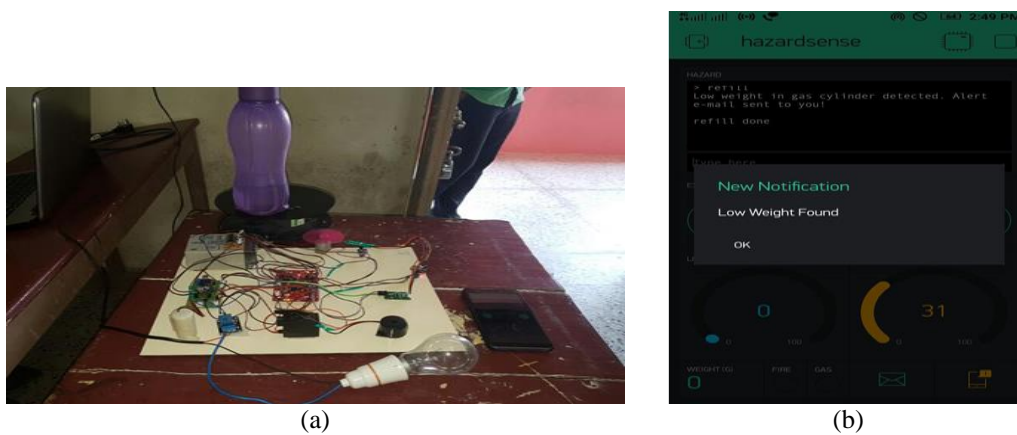


Figure 11. (a) and (b) Low weight alert

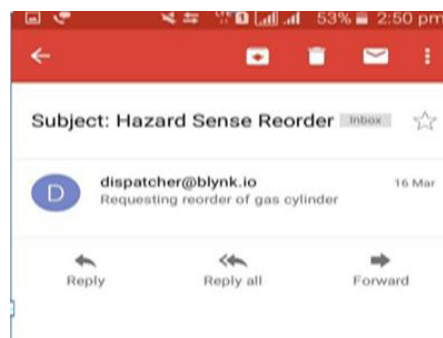


Figure 12. Reordering mail

The Figure1 represents the block diagram of the proposed work. Figure 2 shows the entire hardware kit of the work it consists of the various parts that resemble the block diagram. The hardware kit is connected through wifi. The cell phone displays the acts as front end. Through the cell phone the status of the proposed work can be observed. Figure 3 gives the initial condition of the proposed work. Figure 4 discuss the fire alert. The fire is sensed through the fire sensor and the information is passes through the wifi and it is identified through the cell phone. The alert is given as message to the cell phone Figure 5 (a) and (b). Figure 6 (a) and (b) display the gas before and after gas sensing. Figure 8 gives the load cell operation.

The load cell detects the weight of cylinder. Figure 9 display the weight of cylinder through BYLNK application. Figure 10 (a) and (b) shows the processes of refilling the cylinder. Figure 11 (a) and (b) gives the idea and information about low weight detection and its corresponding alert. Then the Figure 12 represents the reordering mail when the cylinder is empty.

#### 4. CONCLUSION

The proposed work was developed through hardware setup. The stepup was working effectively. It identifies the gas leakage and usage of gas information dead line to change the cylinder. The above details are controlled through online through mobile phone. The real time data and informations are stored in cloud for further retrival of information in future. Based on weight of the cylinder the amount of gas availibale and due date to change new cylinder may also be known. The informations are obtained through SMS from cloud storage.

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