EE322: Embedded Systems Design - Project

GAS LEAKAGE / SMOKE DETECTOR

Project Progress Report

GROUP G26

Date of Submission : 30/07/2021
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Gas Leakage / Smoke Detector
Progress from 09/07/2021 to 30/07/2021

Overall percentage progress

0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Introduction

We were asked to do an embedded system project in EE 322 as a group using PIC Microcontroller. So, we decided make an embedded system for a day today application.

In this project we decided to make a system to detect domestic, industrial smoke or gas leakage. It can be also used to detect combustible gas leakage. To make our project a success we decided to use PIC16F877A microcontroller to fulfill our tasks. Decision was made to use PIC16F877A microcontroller, because it has quite a bit more I/O than PIC16F84A and has about more RAM & FLASH.

Mainly this project can also introduce as a fire alarm system. In here what we do is, we detect a smoke or gas leakage using sensor and simply display it on a LED screen. (Can use an additional buzzer to make a noise).

Brief of past progress (up to from date of this progress report)

After we have given the project proposal, we started to do our project by finding information regarding the project. As we were told to do the project by using assembly language, we have started to learn assembly. Since PIC16F877A is the suitable microcontroller for our project, we started to study the its datasheet and assembly language. In the other hand we have quite some issues regarding the components needed for the project. The biggest issue is with the suitable PIC kit and PIC microcontroller. And we cannot find those from our local electronic shops. Later we decided to buy them online. But PIC kit was out of stock at this moment. We have designed the circuit using Proteus simulation software. Then we started to focus on the programming part and simulation part of the project. These days we are mainly focus on the assembly coding regarding to our project.

Progress for the period from 09/07/2021 **to** 30/07/2021

As the group, we focused mainly on the assembly coding & instructions during this period. Therefore, using the relevant references group members have worked on the programming part of the project. Few more learning is still required to obtain the program because there were some issues we faced during coding. Hence, we had to spend more time to clarify those problems on assembly coding & its instructions.

Since, the PIC16F877A microcontroller was available for us, we bought some of the required components for the hardware implementation as an initial step. But, the PIC KIT-3 programmer was out of stock at the moment & we had to wait for one or two weeks to buy it via online. Group had decided to buy it rather than making an own PIC programmer because there is more reliability within a made PIC programmer.

The circuit implementation was modified with an external power supply & a crystal oscillator circuit for the purpose of testing.
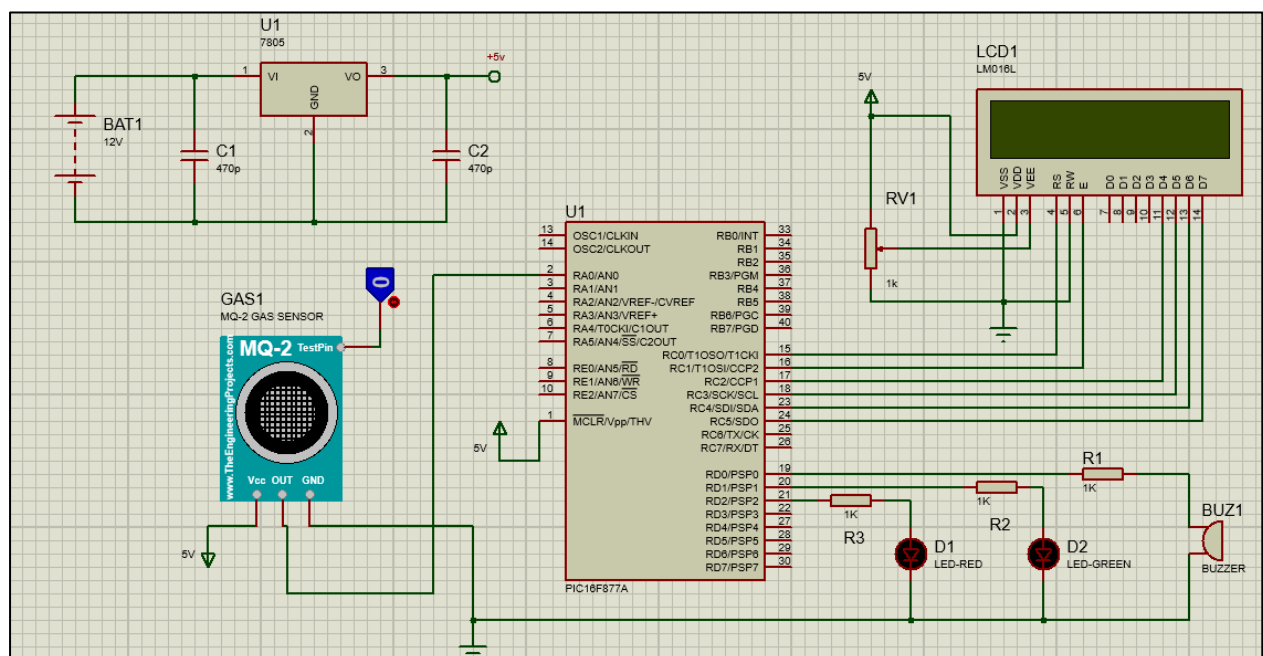

Figure 1 : Circuit implementation using Proteus

Cost Analysis

Task	Budgeted cost (Rs.)	Expenses up to 09/07/2021 (Rs.)	Expenses from 09/07/2021 to 30/07/2021 (Rs.)	comments
Buying PIC16F877A microcontroller	520.00	-	600.00	Ordered PIC was more expensive than the budgeted cost.
Buying the Gas Sensor	300.00	415.00	-	-
Buying other circuit components 1. Resistors -10.00 2. LEDs & Buzzer - 50.00 3. LCD Display -600.00 4. Breadboard – 250.00 5. Wires / Cables -160.00	1070.00	950.00	-	Less than the budgeted cost. LCD display – 480.00
Buying components for the PIC programmer & other components required for circuit	1110.00	-	130.00	PIC programmer was not available online up to this date. PotentiometeR,12V battery & 470Pf capacitors were bought.
Total cost	3000.00	1365.00	730.00	-

Table 1: Cost Analysis

Time line (Gantt chart)

	Planned execution time of the task as of the initial proposal
🟦 (blue)	Planned execution time of the task as of the initial proposal
🟥 (red)	Actual execution time of the task due to delays etc.

Task		Week										
		1	2	3	4	5	6	7	8	9	10	11
1ST Discussion among group members	Identify a problem	🟦🟥	🟦🟥									
	Find a solution & Decide a Project title		🟦🟥									
Project proposal				🟦🟥								
Buy & Order materials online			🟦	🟦	🟦🟥	🟥						
Basic project design					🟦🟥	🟦🟥						
Working on assembly programming part					🟥	🟦🟥	🟦🟥	🟦🟥				
Modify the basic schematic design according to the design						🟥	🟦🟥	🟦🟥				
Circuit Implementation & Troubleshooting									🟦			
Hardware design & testing										🟦	🟦	🟦
Finalization & report												🟦

Table 2: Gantt chart