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TECHNICAL RIVAL FOR GAS LEAKAGE

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Abstract: *Nowadays, the accidents due to gas leakage are claiming the most number of lives. Almost, everyday, we come across incidents where the negligence of an individual living in an apartment, or any defect in the commercial gas pipelines have turned fatal to the people around. The negligence may result in fire or gas leakage accidents. The statistical growth of these types of incidents gave us an alarm that it's time to renew our existing alert systems and propose a novel one. Our proposed system consists of a number of nodes which can be placed in each flat of the apartment and the master node, located in the control center of the apartment. In case of a fire or gas leakage, the message is directly transmitted to the master node. Thereby, necessary action is taken automatically. In addition, it provides auto shut-off system for the gas leakage, thus conserving the gas and saving numerous lives.*

Keywords: MSP430 launch pad, sensors, RF booster pack, Energia software.

I. INTRODUCTION

Objective of the Project:

The primary objective of this project is to provide a novel means for safely detecting any malfunction of a pressurized gas system in order to prevent accumulation of combustible gases so that damage or explosion due such an accumulation to of gases can be prevented.
The gas leakage in industrial sectors causes loss of lives as well as huge financial loss. We may be familiar with the 'Bhopal Gas Leakage Tragedy' which occurred due the 'Methyl Iso - Cyanate' gas that claimed numerous lives. The aftermath of this tragedy is well known to all the Indians. Similar but less intense accidents are occurring even in the present world. In order to prevent such accidents there is a need to develop a novel security and alerting system with the facility of auto shut off.

II. THE PROPOSED SYSTEM

The system consists of several sub nodes and one Master node connected to the entire sub nodes. The sub node comprises of two sensors namely, a temperature sensor *LM 35*and a gas sensor *MQ 5*. This is connected to the processor *MSP EXP430G2*. The MSP-EXP430G2 Launch Pad is an easy-to-use flash programmer and debugging tool for the MSP430G2xx Value Line microcontrollers. This device is connected to a buzzer, an *Auto Shut down System*, and an *encoder HT12E* which in turn is connected to the *RF 430 BOOST CC11DC* which is used in the transmission of information. The Master node is made up of an *RF 430* which is connected to the *Decoder HT12D*. This is connected to *MSP EXP430G2* which is connected to several alerting devices like the *buzzers, LEDs* and *LCD Displays.*

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Software Description:

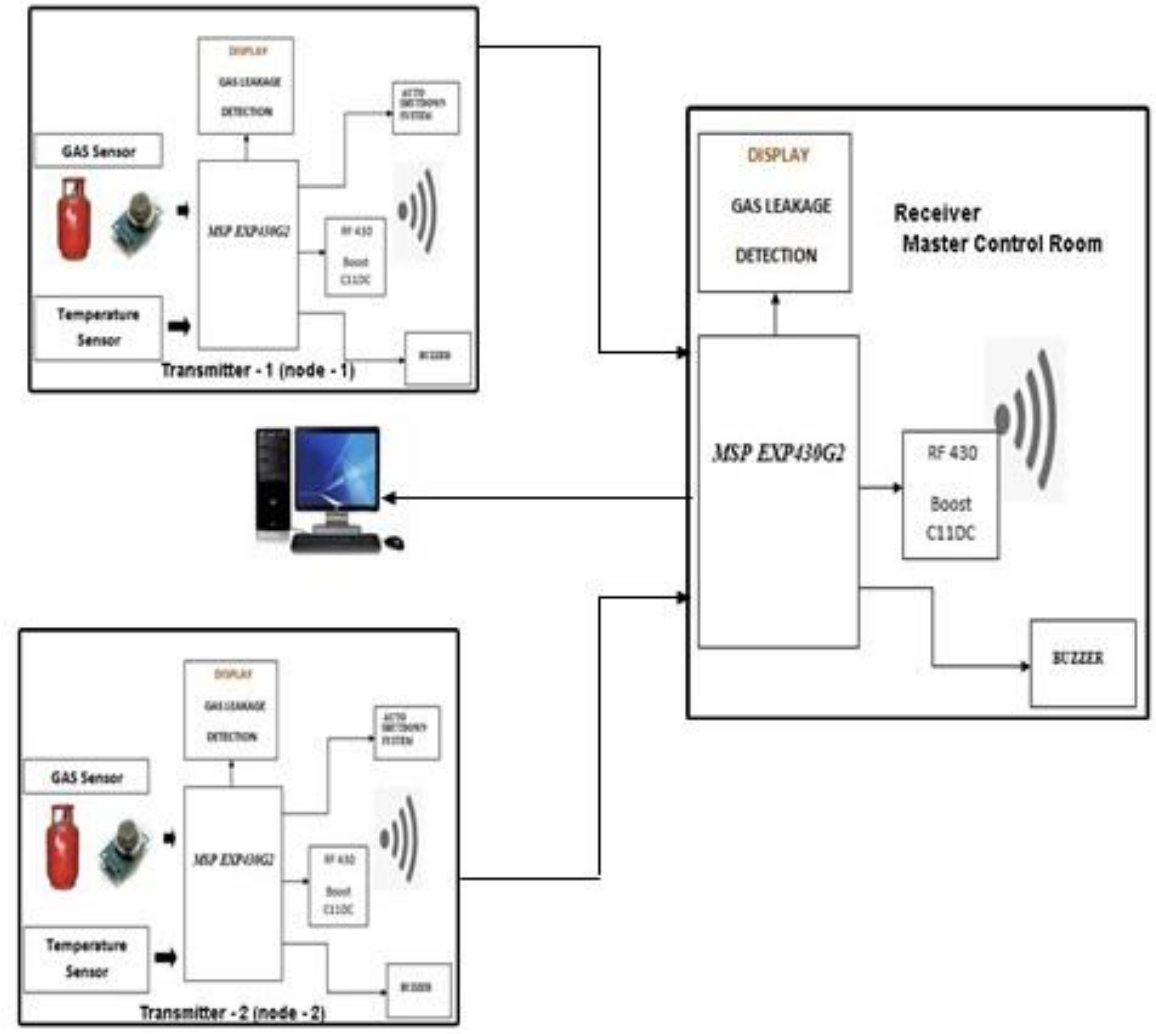
Energia is an open source software. The Energia IDE is cross platform and is supported on Mac OS, Windows and Linux. Energia uses the MSPGCC compiler. Energia includes an Integrated Development Environment (IDE) that is based on processing.Energia started out to bring the Wiring and Arduino framework to the Texas Instruments MSP430 Launch Pad.

Texas Instruments offers a MSP430, TM4C, C2000andCC3200 Launch Pad. The Launch Pad is a low-cost microcontroller board Together with Energia, Launch Pad can be used to develop interactive objects, taking inputs from a variety of switches or sensors, and controlling a variety of lights, motors, and other physical outputs [13]. Launch Pad projects can be stand-alone (only run on the Target Board, i.e. Launch Pad), or they can communicate with software running on your computer (Host PC).

Working Principle:

The sub nodes are placed in flats and master node is placed in control centre. The sub nodes detect for the presence of any gas leakage, abnormal rise in temperature.If any abnormalities are found, information from the sub node is transmitted to the master node with the help of RF booster pack (CC110L AIR INTERFACE). To alert about the problem, the buzzer rings at the corresponding region where leakage is found. At the master node the buzzer and LED are activated to intimate about the abnormality detected in the particular flat.

System Architecture Design:



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FLOW CHART:

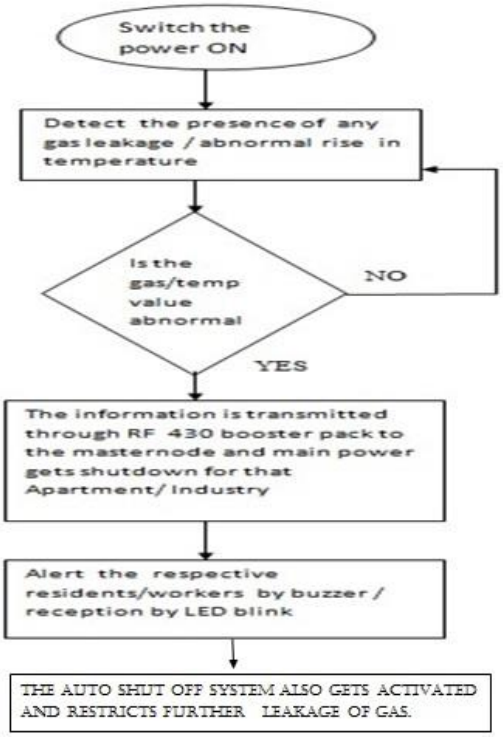
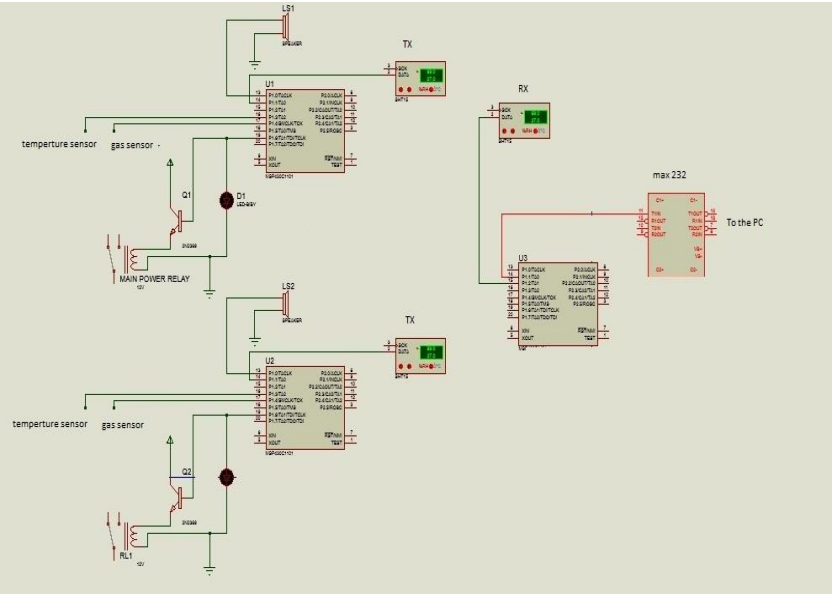


Figure 6.1 flow char

Circuit diagram:



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III. CONCLUSION AND FUTURE ENHANCEMENTS

The occurrence of gas leakage can be sensed and immediate action can be taken. This prevents mass loss of lives, especially in areas where several gas terminals are activated within a small area. Implementation of this system may prevent replicas of past accidents. In future enhancement, we can modify the above system using RTOS (Real Time Operating System). If RTOS is used then any malfunctioning of the sensors or other elements can be easily detected and corrective actions can be taken accordingly and so the system can be made very efficient.

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