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SCHOOL OF ELECTRONICS ENGINEERING

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DATA ACQUIZATION TECHNIQUES PROJECT REPORT

(ECE3042)

Topic

INDUSTRIAL POLLUTION MONITORING USING LABVIEW AND ARDUINO

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Declaration

This is to declare that this report has been written by us. No part of the report is plagiarized from other sources. All information included from other sources have been duly acknowledged. We aver that if any part of the report is found to be plagiarized ,we are shall take full responsibility for it.

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ABSTRACT

With the increase in the number of industries in the world today, it is important to keep the environment healthy for living and non-toxic.

This project concentrates on the design a pollution monitoring system that would be detecting the toxic gases concentration in the atmosphere in industries like chemical, paper , etc. The design continuously monitors levels of gases such as LPG, CO, etc. and warns for increasing level of toxic level of gases.

The project uses Gas sensors and Arduino for detecting and transmitting the detection to LabVIEW software for further results.

INTRODUCTION

In the modern era of globalisation and industrialisation, where industries are must for maximum production, it is necessary for industries like chemical, paper , etc industries to keep pollution levels and toxic and flammable gases in check to avoid any disasters and to keep the environment healthy for living.

Many types of gases—such as chlorine, phosgene, sulphur dioxide, hydrogen sulphide, nitrogen dioxide, and ammonia—may suddenly be released during industrial accidents and may severely irritate the lungs. Gases have also been used as chemical warfare agents. Gases such as chlorine and ammonia easily dissolve and immediately irritate the mouth, nose, and throat. The more peripheral parts of the lungs are affected only when the gas is inhaled deeply. A common household exposure occurs when a person mixes household ammonia with cleansers containing bleach. The irritant gas chloramine is released.

Some gases—for instance, nitrogen dioxide—do not dissolve easily. Therefore, they do not produce early warning signs of exposure, such as irritation of the nose and eyes, and they are more likely to be inhaled deeply into the lungs. Such gases can cause inflammation of the small airways (bronchiolitis) or lead to fluid accumulation in the lungs (pulmonary enema).

This project detects gases using gas sensors MQ-2 and MQ-9 interface with microcontroller Arduino which is connected to LABVIEW through LINX interface.

LabVIEW offers a graphical programming approach that helps you visualize every aspect of your application, including hardware configuration, measurement data, and debugging. This visualization makes it simple to integrate measurement hardware from any vendor, represent complex logic on the diagram, develop data analysis algorithms, and design custom engineering user interfaces.

LIFA software is used to connect hardware sensors and Arduino with LabVIEW software

LINX is the successor to LIFA but is a completely new toolkit built from the ground up. LINX is designed to be a more generic hardware abstraction layer for embedded devices such as chipKIT, Arduino, myRIO, etc, rather than designed for one specific microcontroller platform. This means that LINX provides the infrastructure to add support for virtually any device.

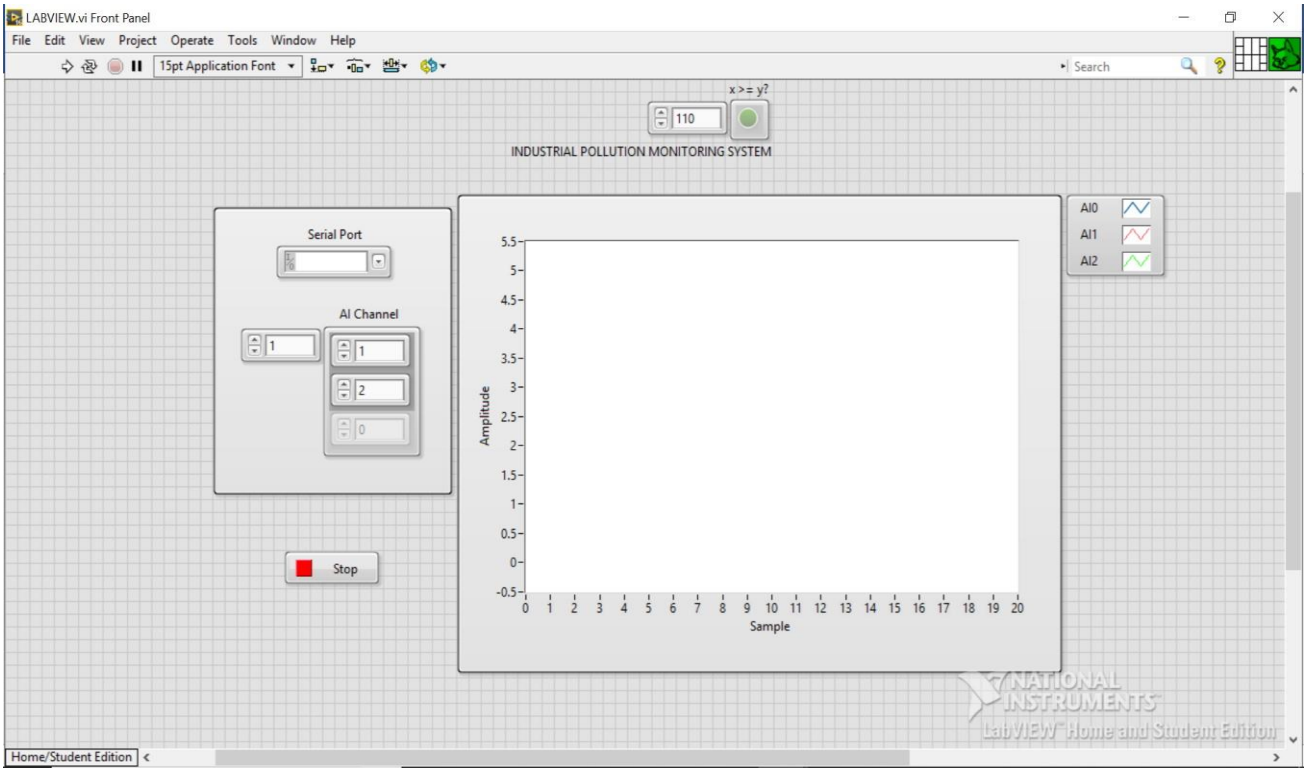
In addition LINX provides many improvements over LIFA such as better error handling, more sensor support, Ethernet and Wifi support. LINX also removes the need for the user to build the firmware from source by providing a wizard interface with pre-compiled firmware.

LIFA will not receive any updates going forward, but LINX will get regular bug fixes, new features as time permits and I'll do my best to help out with community feature requests.

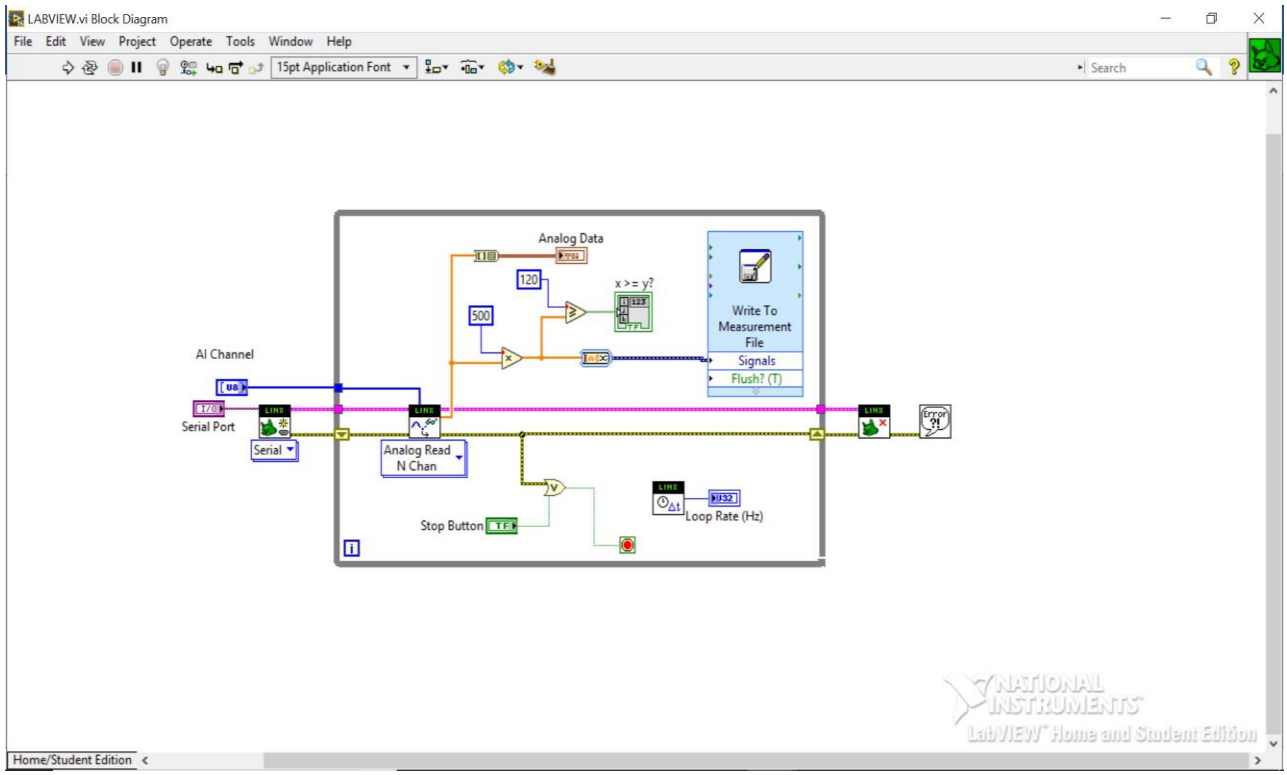
EXPERIMENTATION AND METHODOLOGY

- The gas sensors used are MQ2 and MQ9 gas sensors.
- MQ-2 gas sensor has high sensitivity to LPG, Propane and Hydrogen, also could be used to Methane and other combustible steam, it is with low cost and suitable for different application.
- MQ-9 gas sensor has high sensitivity to Carbon Monoxide, Methane and LPG.
- The sensor could be used to detect different gases contains CO and combustible gases, it is with low cost and suitable for different application.
- The gas sensors are connected to the the Arduino and to get the necessary output and the complete analysis of the concentration level of the gases we use lab view for which Arduino UNO is interfaced with LabVIEW using the LINX software.
- The output of the Arduino is communicated to the lab view with the help of LINX software.

The front panel of VI is shown below:

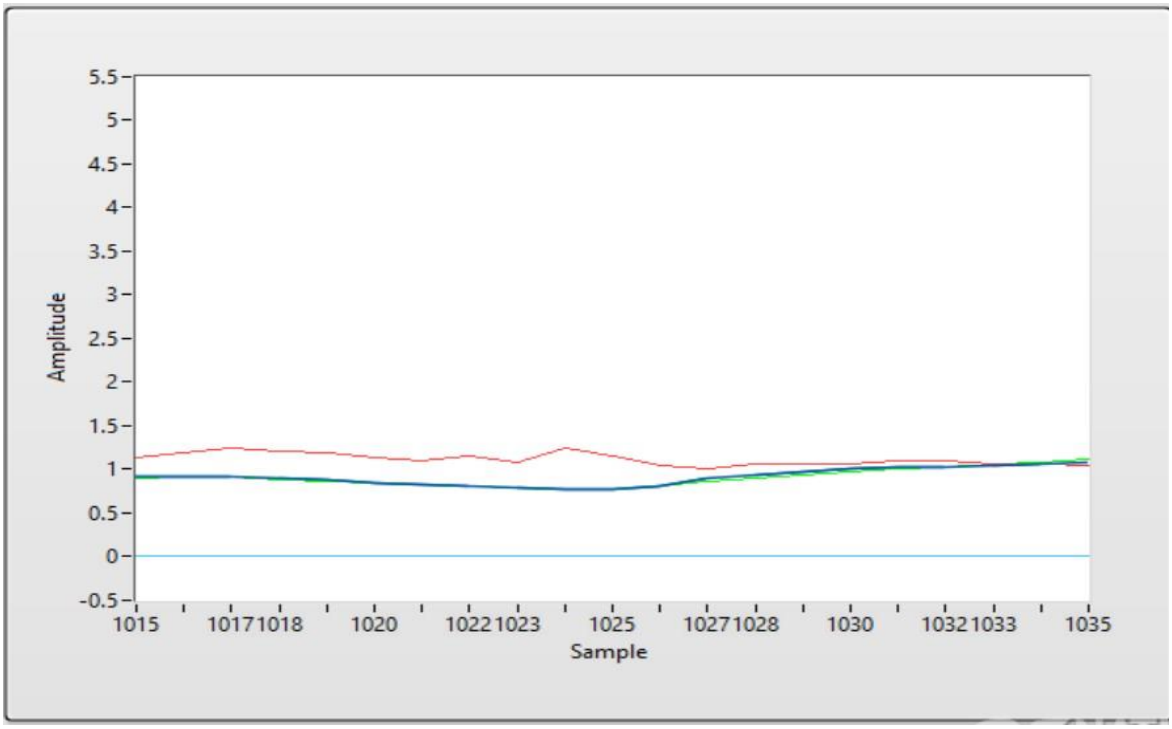


This is the required block diagram of VI:

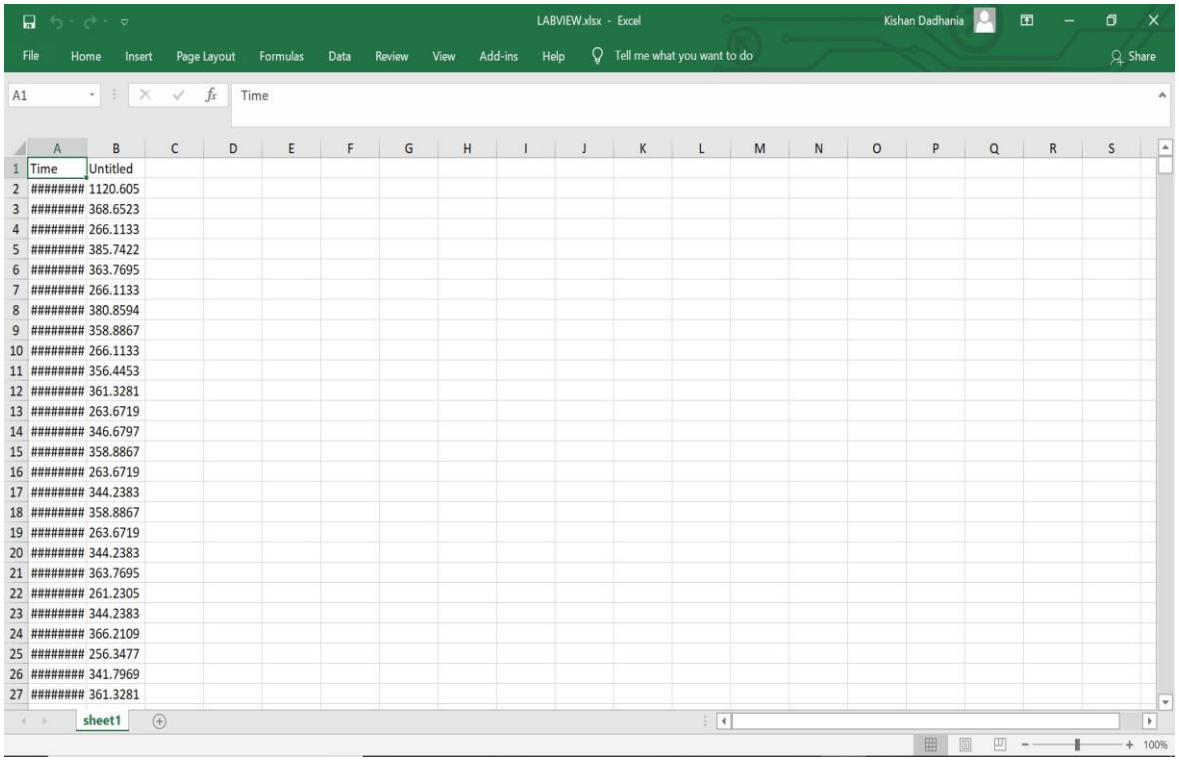


RESULTS AND DISCUSSION

The graph of the output of both the sensors (MQ2 and MQ9) are displayed in the output on the front panel



The values of the concentration in ppm are displayed in excel sheet



CONCLUSION AND RECOMMENDATION

- The gas sensor was appropriately connected to Arduino which was successfully interfaced with ARDUINO and required graph and values were obtained .
- The project could have been better and more organized if used a led light to indicate that the gas concentration has went above the threshold.
- We could have also used a buzzer as an alarm for the indication.
- Instead of breadboard we should have used a PCB which is more convenient to use and errors will decrease

REFRENCES

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END OF THE REPORT