

AIR QUALITY MONITORING SYSTEM

GROUP MEMBERS:

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CONTENTS

- Brief Introduction
- Equipment's/Components
- Block Diagram
- Flow Chart
- Working
- Simulation
- Deliverables
- Challenges
- Task Management
- Conclusion

PROBLEM STATEMENT

- Air pollution is one of environmental issues that cannot be ignored.
- Inhaling pollutants for a long time causes damages in human health.
- Traditional air quality monitoring methods, such as building air quality monitoring stations, are typically expensive.
- This project is suitable for air quality monitoring in real-time.

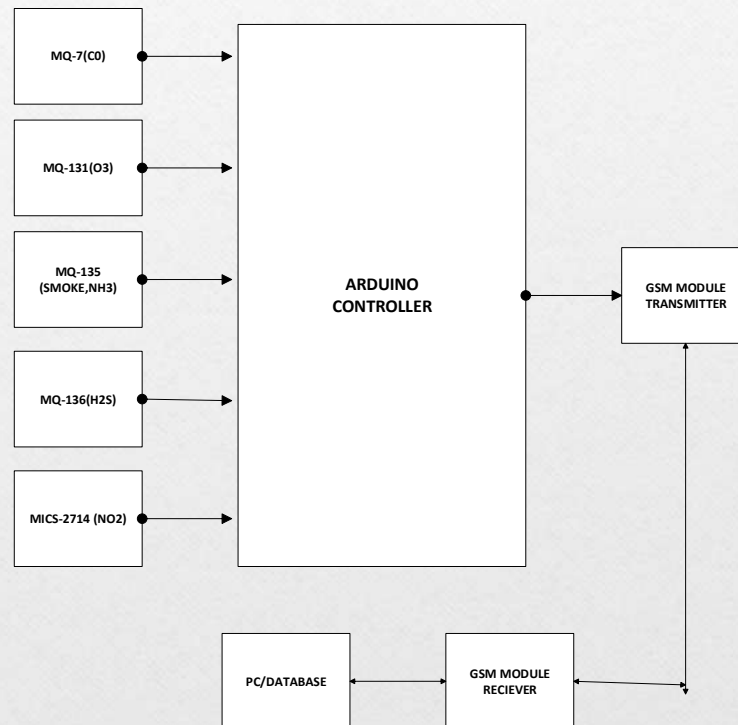
INTRODUCTION

- The purpose of our device is to monitor the quality of air using different sensors.
- Sensors data is then collected in controller and transmitted through GSM module to PC where it is calibrated and displayed to user.
- The data is stored in database in order to extract information for future use.

COMPONENTS

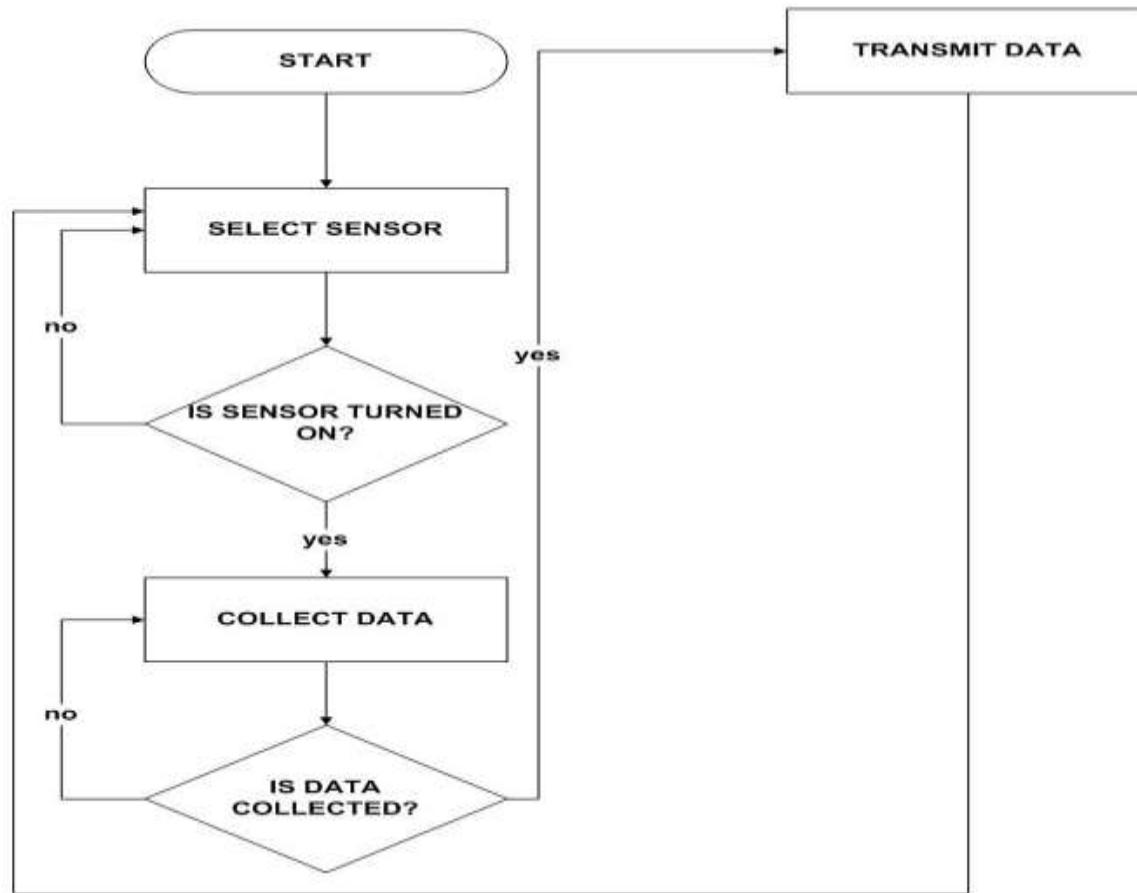
- Sensors
 - MQ-7(Carbon mono-oxide sensor)
 - MQ-131(Ozone sensor)
 - MQ-135(Smoke sensor/air pollution)
 - MQ-136(Hydrogen sulphide sensor)
 - MICS-2714(Nitrogen dioxide sensor)
- Controller
 - Arduino UNO-R3
- GSM module(transmitter/receiver)

BLOCK DIAGRAM



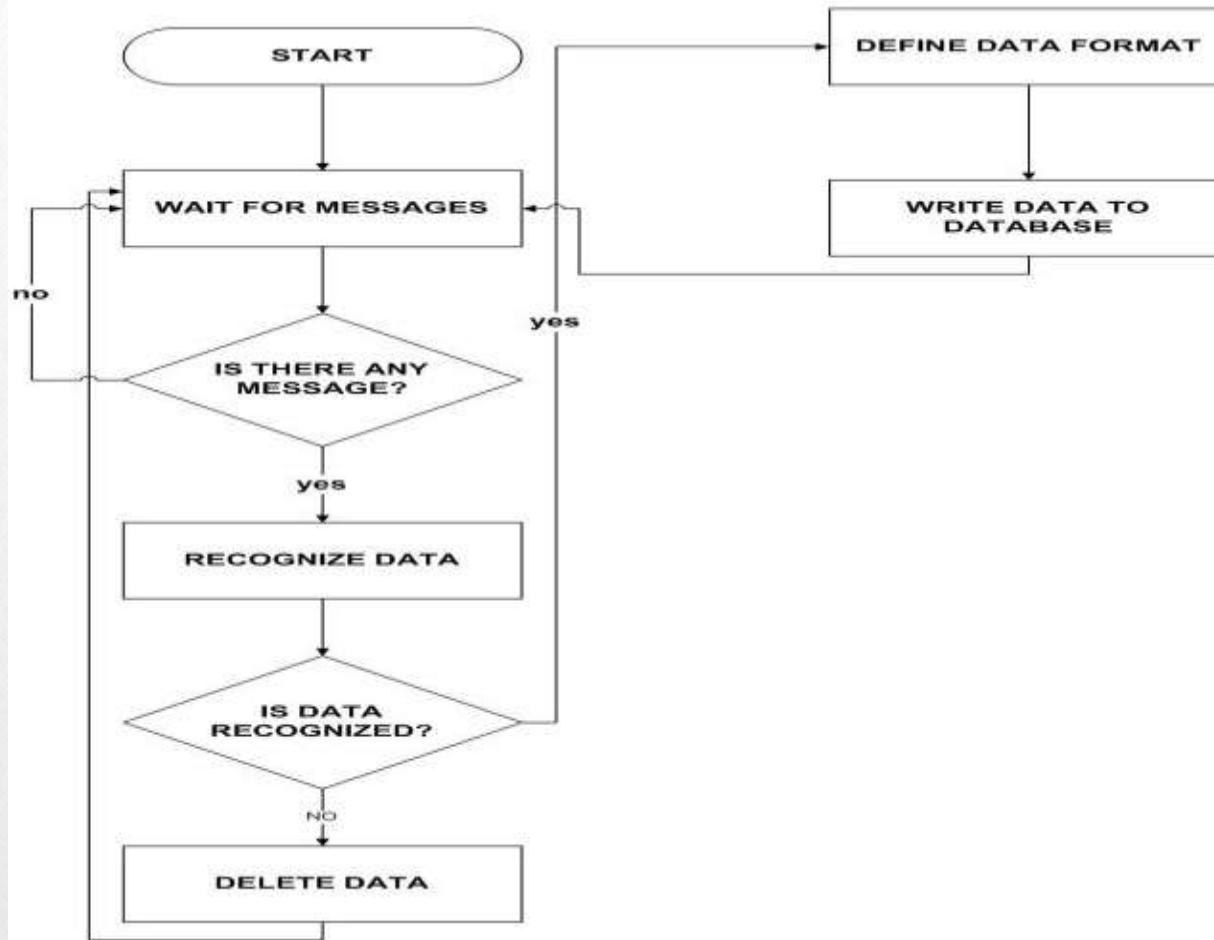
FLOW CHART

Transmission



FLOW CHART

Reception



Working

- MQ-7 is a 6-pin device that is used to detect concentration of CO in air.
- $VCC=5V$
- Can detect CO-gas concentrations anywhere from 20 to 2000ppm.
- High sensitivity and fast response time

CONTD..

- MQ-131 gas sensor is used to detect O₃ concentration in air.
- It's also 6 pin device, 4 of them are used to fetch signals, and other 2 are used for providing heating current.
- VCC=5V
- Can detect O₃ concentration form 10ppb-2ppm
- Fast response and high sensitivity.

CONTD..

- MQ-135 is used for detecting a wide range of gases, including NH_3 , NO_x , alcohol, benzene, smoke and CO_2 .
- 6 pin device.
- $\text{VCC}=5\text{V}$
- Detecting concentration scope 10ppm-300ppm NH_3
- 10ppm-1000ppm Benzene
- 10ppm-300ppm Alcohol

CONTD..

- MQ-136 sensor used to detect the concentration of hydrogen sulphide present in air.
- 6 pin device but since we are using module MQ-131 thus it has 4 pins
 - 1. VCC=5v
 - 2.DOUT(Digital output)
 - 3.AOUT(Analogue output)
 - 4.GND
- Detecting concentration scope:
1-100ppm H₂S

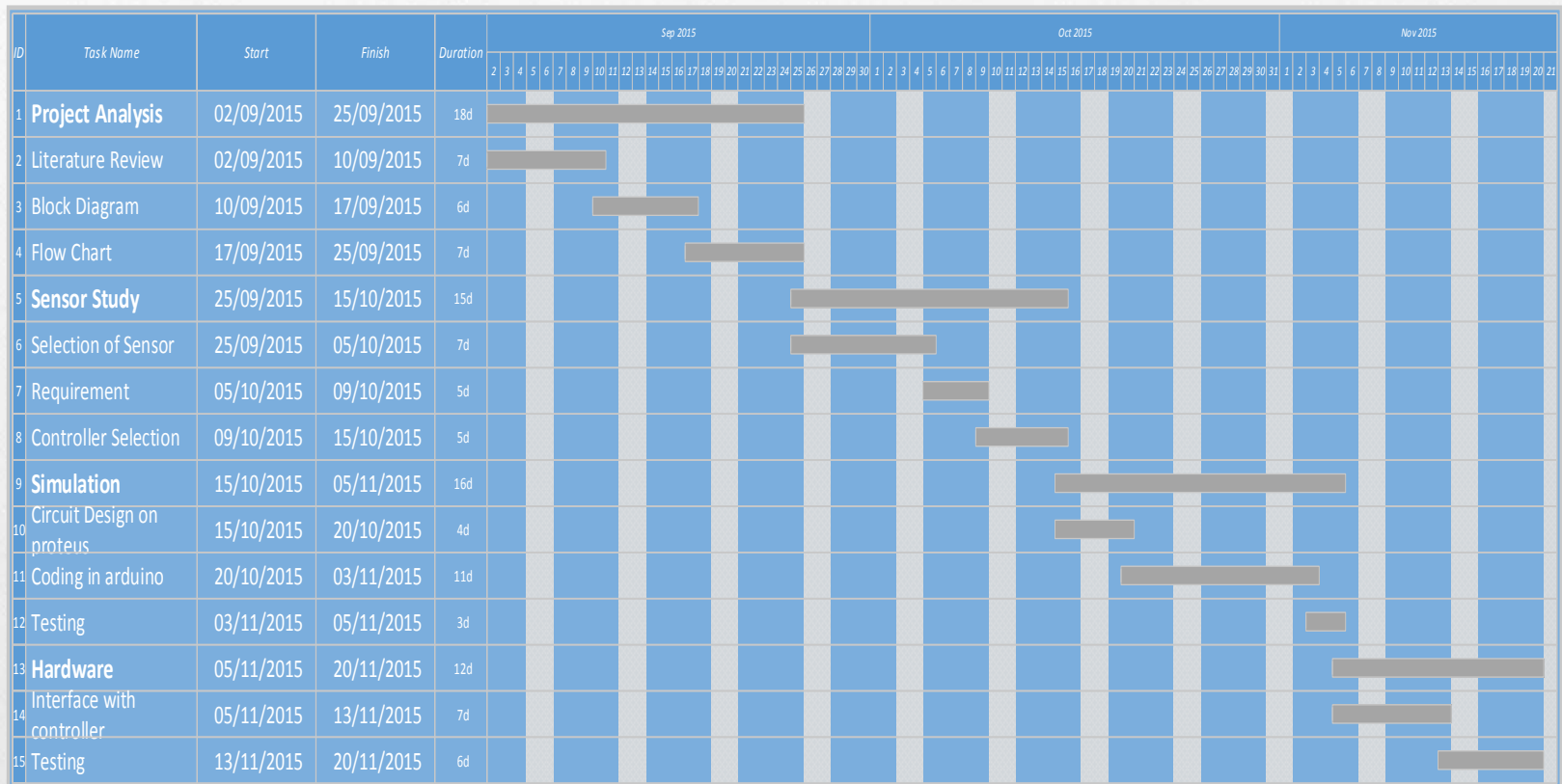
CONTD..

- MICS-2714 is a robust MEMS sensor for nitrogen dioxide and leakage detection.
- **Detectable gases**
 - Nitrogen dioxide NO₂ 0.05 – 10ppm
 - Hydrogen H₂ 1 – 1000ppm

SIMULATION

- ALGORITHM

DELIVERABLES



TASK MANAGEMENT

ARHAM SHAH	M.ALATAF KHATTAK	ANEES WAQAR
1.) Literature Review 2.) Sensor and controller study and their selection 3.) Block Diagram 4.) Documented Work	1.) Coding 2.) Simulation 3.) Algorithm 4.) Documented Work	1.) Hardware part 2.) Gantt chart 3.) Documented Work 4.) Visited EPA for data collection and sensors info

CHALLENGES

- Collection of data/calibration.
 - Visited EPA thrice.
 - They just imported devices from japan and they only know how to operate. They don't know the how that device works.
- Sensor ordered but not received yet thus we just stimulate how sensors will work.

CONCLUSION

- Till mid of December our sensors will arrive (sir Kashif Islam)
- Interface with controller will then be completed
- In FYP-2 prototype of device and its GUI on PC will be completed.
- Data will be then verified by EPA.