

GOVERNMENT COLLEGE OF ENGINEERING, ERODE



அரசினர் பொறியியல் கல்லூரி, ஈரோடு
Government College of Engineering, Erode

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)



B.E Electronics and Communication Engineering

AIR QUALITY MONITORING

Done By

TEAM LEADER: SRIVATSAN B	731121106046
TEAM MEMBER: GOKULPRASANTH M	731121106015
TEAM MEMBER: MITHUN KUMARAN G	731121106032
TEAM MEMBER: ABISHIEK T	731121106301

Under the mentor of **Dr.M.SATHYAKALA**

Department of Information Technology (IT)

Department of Electronics and Communication Engineering.

Government College of Engineering

Erode ,PO ,near Vasavi College,TamilNadu-638316,Affiliated to Anna University ,Chennai.

INTRODUCTION:

Air pollution has been a global challenge for environment protection. Effectively collecting and scientifically visualizing the air quality data can better help us monitor the environment and address related issues.

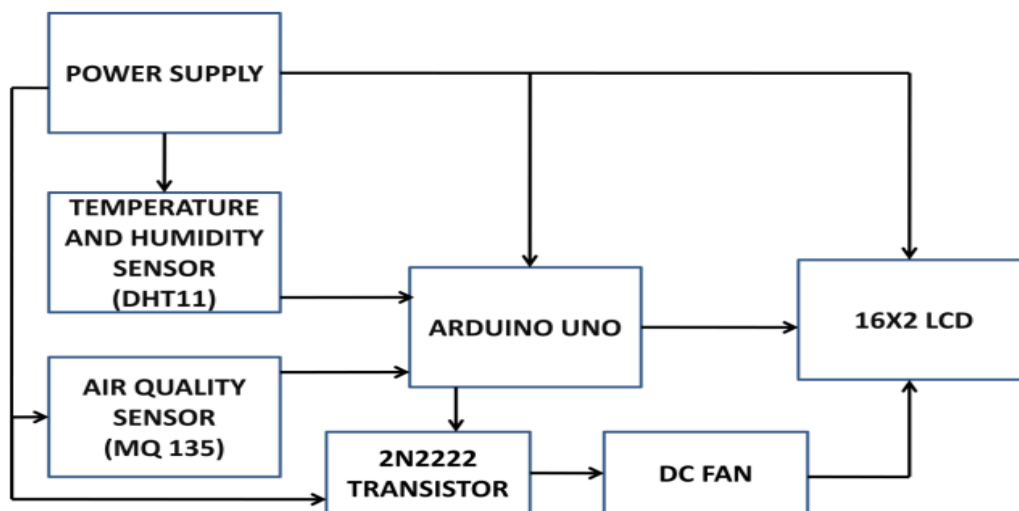
HOW THINGS STAND:

The system measures carbon dioxide, carbon monoxide and temperature in the air. It should be continuously monitored manually. The great amounts of data coming from the devices introduce some challenges related to the storage and processing capabilities of the information. It does not have automatic air purification system in it.

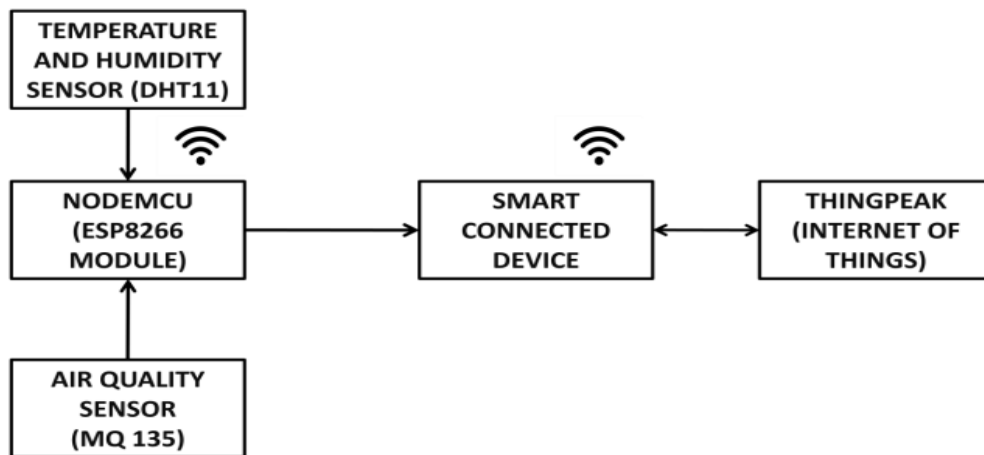
DEVICE WORKING:

- ✓ The design included various units mainly: sensing unit, processing unit, power unit, display unit and communication unit.
- ✓ The system operates over an existing WIFI wireless network utilizing the MQTT protocol.
- ✓ It is capable of monitoring the indoor air quality as well as controlling an air purifier to regulate the particulate matters concentration.
- ✓ As communication module sends the data to the central monitoring unit and then the data would be saved in the cloud. The saved data can be utilized for analysing the air quality over a period of time.

BLOCK DIAGRAM:



Block Diagram of Air Quality Monitoring and Sensing



Block Diagram of sending the data to THINGSPEAK using NodeMCU

OUR INNOVATION:

- The system integrates a single-chip microcontroller, several air pollution sensors (NO₂, SO₂, O₃, CO, PM₁, PM₁₀), LongRange (LoRa) - Modem, a solar PV-battery part and graphical user interface (GUI).
- The range tests at an outdoor area show that LoRa is able to reach to approximately 2Km. The TX power is only about 110mA which is lower compared with other used wireless technology.
- The proposed air pollution monitoring system can generate warnings when the pollution level exceeds beyond a predetermined threshold value.
- The designed system allows us to monitor air quality conditions on a desktop/laptop computer.

CONCLUSION:

Due to the implementation of LoRa technology, GUI, Solar PV- Air quality sensing and monitoring, 9 battery part the system has several progressive features such as low cost, long distance, high coverage, long device battery life, easy to operate. As it gives warnings when the pollution level exceeds beyond the predetermined threshold value it will be easy to monitor and take actions on it. As the Device has a sensor network it can provide high-quality air quality measurements over a wide range of CO, NO₂ and dust concentrations.