NOISE POLLUTION MONITORING

DEFINITION:

Noise monitoring involves the long-term tracking of sound levels without constant human intervention. There are two primary categories of noise monitoring: workplace noise monitoring and environmental noise monitoring. The distinction between them is based on the location and purpose of the sound source. Among these, environmental noise monitoring is a prevalent form of environmental surveillance, and it is typically conducted using specialized monitoring systems.

WHEN IT IS ESSENTIAL?

Noise monitoring is essential whenever there's a risk of exceeding established noise level limits. This practice stems from comprehensive studies on the connection between noise and health, leading governments in various countries to

set national limit values and regulations for environmental noise

OBJECTIVES:

To provide data regarding the level of noise in a location so that it may be compared to the established noise limits.

To regulate and control noise producing and generating sources.

NOISE POLLUTION:

Noise pollution can cause health problems for people and wildlife, both on land and in the sea. From traffic noise to rock concerts, loud or inescapable sounds can cause hearing loss, stress, and high blood pressure. Noise from ships and human activities in the ocean is harmful to

whales and dolphins that depend on echolocation to survive.

There are Two Main Types of Noise Monitoring:

The two types are instantaneous monitoring (handheld) and continuous monitoring (unattended):

Instantaneous Monitoring: uses a handheld SLM to take readings for short periods of time. This may be useful to get an idea of what the typical sound level from a source may be, or to check what noise is produced during worst case conditions (i.e. all machinery operating at the same time).

Continuous Monitoring: uses a SLM positioned at a fixed location to measure sound levels. This type of monitoring is used to alert a site when noise levels are above a compliance limit.

COMPONENTS USED:

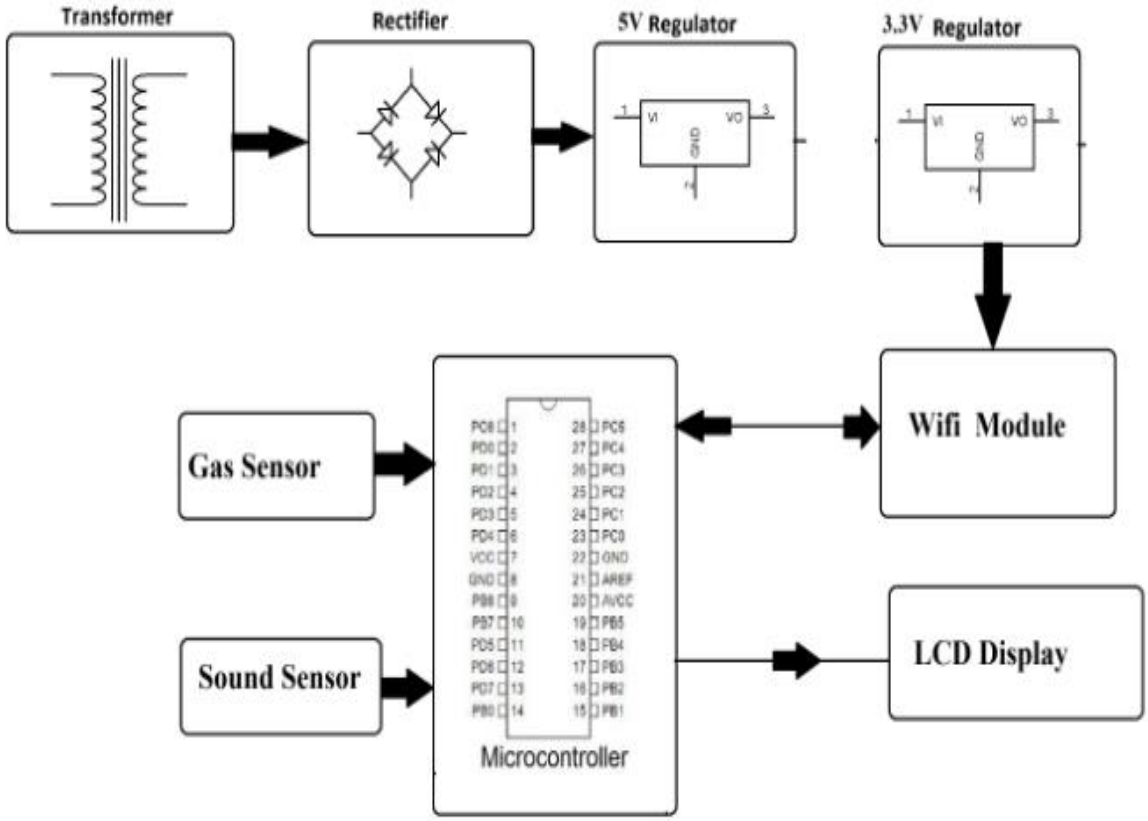
1. Pre-amplifier
2. Frequency weighting
3. Processor
4. Display System
5. Communication System
6. Power Supply

DEVICES USED TO CONTROL NOISE POLLUTION:

1. Eco-barriers
2. Acoustic barriers
3. Ceiling baffles

4. Soundproof doors and windows
5. Acoustic enclosures
6. Acoustic foams
7. Acoustic canopies

BLOCK DIAGRAM:



SOUND SENSOR:

This module allows you to detect when sound has exceeded a set point you select. Sound is detected via a microphone and fed into an LM393 op amp. The sound level set point is adjusted via an on board potentiometer. When the sound level exceeds the set point, it automatically sends the message to the server through wifi connectivity

GAS SENSOR:

MQ-135 Module sensor has lower conductivity in clean air. When the target combustible gas exist, the sensors conductivity is morehigher along with the gas concentration rising. Convert change of conductivity to correspond output signal of gas concentration. MQ135 gas sensor has high sensitivity to Ammonia,

Sulphide and Benzene steam, also sensitive to smoke and other harmful gases. It is with low cost and suitable for different applications such as harmful gases/smoke detection.

ESP8266 WIFI MODULE:

It is the leading IOT devices in the world in which it is very cheap and effective to use. The hardware connections required to connect to the ESP8266 module are fairly straight-forward but there are a couple of important items to note related to power: • The ESP8266 requires 3.3V power–do not power it with 5 volts! • The ESP8266 needs to communicate via serial at 3.3V and does not have 5V tolerant inputs.so you need level conversion to communicate with a 5V microcontroller like most Arduinos use.

CLD DISPLAY:

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.

TRANSFORMER:

device that transfers electric energy from one alternating-current to one or more other circuits, either increasing (stepping up) or reducing (stepping down) the voltage. Transformers are employed for widely varying purposes; e.g., to reduce the voltage of conventional power circuits to operate low-voltage devices, such as doorbells and toy electric trains, and to raise the voltage from

electric generators so the electric power can be transmitted over long distances.

Transformers change voltage through electromagnetic induction; i.e., as the magnetic lines of force (flux lines) build up and collapse with the changes in current passing through the primary coil, current is induced in another coil, called the secondary. The secondary voltage is calculated by multiplying the primary voltage by the ratio of the number of turns in the secondary coil to the number of turns in the primary called the turns ratio.

RECTIFIER:

A rectifier is an electrical component that converts alternating current (AC) to direct current (DC). A rectifier is analogous to a one-way valve that allows an electrical current to flow in only one

direction. The process of converting AC current to DC current is known as rectification. A rectifier can take several physical forms, such as solid-state diodes, vacuum tube diodes, mercury-arc valves, silicon-controlled rectifiers, and various other silicon-based semiconductor switches.

MICROCONTROLLER:

A microcontroller (MC, UC, or µC) or microcontroller unit (MCU) is a small computer on a single integrated circuit. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in PC.

CONCLUSION:

By keeping the embedded devices in the environment for monitoring enables self protection

(i.e., smart environment) to the environment. To implement this need to deploy the sensor devices in the environment for collecting the data and analysis. By deploying sensor devices in the environment, we can bring the environment into real life i.e. it can interact with other objects through the network. Then the collected data and analysis results will be available to the end user through the Wi-Fi. The smart way to monitor environment and an efficient, low cost embedded system is presented with different models in this paper. In the proposed architecture functions of different modules were discussed. The noise and air pollution monitoring system with Internet of Things (IoT) concept experimentally tested for monitoring two parameters. It also sent the sensor parameters to the cloud (Google Spread Sheets). This data will be helpful for future analysis and it can be easily shared to other end users. This model can be further expanded to monitor the developing

cities and industrial zones for pollution monitoring. To protect the public health from pollution, this model provides an efficient and low cost solution for continuous monitoring of environment.