

Automatic Industrial-Based Air Pollution Avoidance System Using Iot

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Abstract - Many changes in air characteristics can be caused by air pollution. Indoor air pollution can cause harmful results. Welding for example may generate harmful pollutants like a fume. Direct exposure to pollutant gases may increase health risks also these harmful gases may threaten the environment. For these reasons, air pollution is an important issue and attention must be taken to reduce its risks to the environment and health. An air pollution avoidance system using a gas sensor is introduced in this paper to avoid indoor air pollution. A prototype of the proposed system contains ESP8266(NODEMCU) with a gas sensor that sense CO, LPG, NO₂, NH₃, CH₄, SO₂, butane, propane, and ethanol., all kind of gas which are organized in the sensor infrastructure. The gas sensor is controlled by a microcontroller to support real-time monitoring strategies. When the gas level or pollution indoors will be high the exhaust fan will automatically on and pullout the pollution outside to protect the indoor environment.

Keywords: CO Sensor, LM35/ Temperature Sensor, Arduino IDE, GPS

I. INTRODUCTION

An integrated assessment has not been done at a regional scale for solar. This research program, therefore, has as its goal the development of an integrated scientific understanding of the prevailing air quality processes, drivers, and environmental impacts in the solar region to support effective regional air pollution control and management. The rapid pace of urban and industrial development in the solar region has meant that a comprehensive and integrated scientific understanding on which to build a regional regulatory monitoring program and integrated regulatory framework bubble license has not been possible to date. With the anticipated growth of the adjacent free zone and the industrial area and the need to also consider urban air pollution problems as the city of solar grows, it will become increasingly important to be able to predict regional air quality impacts and to plan accordingly at present a matrix of data sets is being acquired by industry and the SEU concerning three categories of air pollution: odor, toxicants, and dust.

Odor is a major concern to the nearby communities inland of the port, arising from the petrochemical industries operating in the sip. Similarly, the nature and fate of toxicants released from industrial and mining operations in the region have not been well quantified in the past, except for specific studies.

If this process is seen to be evident in Oman, then it may turn out that the use of air quality standards from other regions is not directly applicable and should be adjusted accordingly. For many cities around the world, particularly those that have experienced rapid growth, urban air pollution is seen as a critical issue. In recognition of the need to focus on urban air quality issues as the city of Solar grows, a reference air quality and the meteorological station will be established at the solar university campus. This will be part of an ongoing, long-term commitment to providing baseline data for the region. It is anticipated that this site will be critical to the longer-term need to establish air quality targets for solar as an urban and suburban environment, as the regional population grows. Note that the unit to be installed at solar university is the same as those being installed by MECA in the port area.

II. EXISTING SYSTEM

Existing devices used for pollution monitoring needed manual collection and processing of knowledge continuously from time to time which successively needs a group of staff to continuously monitor and log the info. A model has been created and it screens the changeability of boundaries like Air, Noise, Temperature, Humidity, and lightweight.

III. PROPOSED SYSTEM

In this section, a description of the proposed system is provided. This system will monitor the Air Quality over an application using the internet and will trigger a notification when the air quality goes down beyond a certain level, which means when there are a sufficient amount of harmful gases present in the air like CO₂ (carbon dioxide), smoke, alcohol, benzene and NH₃ (ammonia), LPG (liquefied petroleum gas). The Block Diagram of Proposed System is shown in 1. It will show the air quality in parts per million (PPM) on the LCD and as well as on a mobile application that can be monitored very easily.

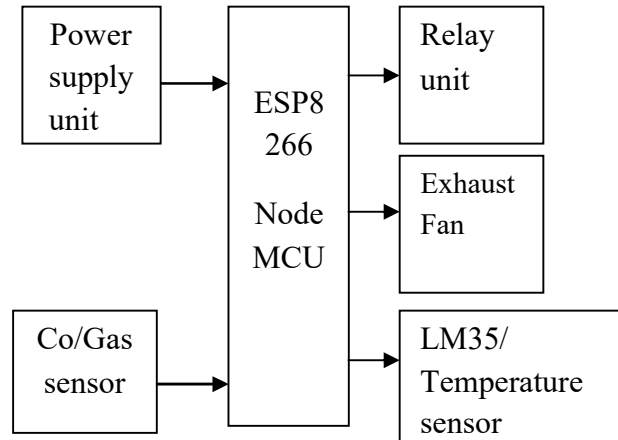


Fig 1: Block Diagram of Proposed System

The Air pollution avoidance system is very important to detect the contamination in the air just as CO, NO₂, SO₂, and PM which may degrade the health of the human. Normally Part per Million (ppm) unit is used to measure the concentration of air pollutants. It symbolizes the mass units of gas per one million units of the overall mass. A prototype of the proposed system contains a gas sensor that senses CO, LPG, NO₂, NH₃, CH₄, SO₂, butane, propane, and ethanol, all kinds of gas that are organized in the sensor infrastructure. The gas sensors are controlled by a microcontroller to support real-time monitoring strategies. When the gas level or pollution indoors will be high the relay unit will switch the exhaust fan will automatically on and pull out the pollution outside to protect the indoor environment. LM35 Temperature sensor will sense the environmental temperature and the output will be displayed in the LCD Unit output and also send to the thing speak website via node mcu.

IV. SIMULATION

MODE 1 [SIMULATION OF PROPOSED SYSTEM]

Now run the Proteus Simulation, and if everything goes fine, press the run button and the Proteus software running. The Simulation of Proposed System is shown in

2. We have to run the Arduino by using Digital (PWM) and next we have to click the virtual terminal.

An automatic industrial-based air pollution avoidance system using IoT involves the use of interconnected devices and sensors to monitor air quality in and around industrial facilities. The system is designed to detect air pollution levels and take necessary actions to prevent or reduce further pollution.

Sensors: The system includes various sensors that can detect different types of pollutants such as particulate matter, carbon monoxide, sulfur dioxide, and nitrogen oxides. The CO Sensor is shown in Fig 5. The sensors are placed at strategic locations around the industrial facility to monitor the air quality.

Cloud Platform: The cloud platform receives the data from the IoT gateway and processes it in real time. The platform analyses the data and provides actionable insights that can be used to improve air quality. The platform can also send alerts and notifications to the appropriate personnel when pollution levels exceed acceptable limits.

Actuators: The system includes various actuators that can take necessary actions to prevent or reduce air pollution. For example, if the system detects high levels of particulate matter, it can activate air filters to clean the air. Similarly, if the system detects high levels of carbon monoxide, it can shut down certain processes or reduce emissions from specific sources. The benefits of an automatic industrial-based air pollution avoidance system using IoT include improved air quality, reduced health risks for workers and nearby communities, and compliance with environmental regulations. The Hardware Output is shown in Fig 6. The system can also help industries save money by reducing energy costs and avoiding fines for non-compliance.

V. CONCLUSION

The paper is proposed the implementation of IOT based Automatic industrial based air pollution avoidance system using Gas/CO sensor. The implemented system is easy to use and not so expensive. It also include to detect and avoid indoor air pollution by turning fans on and alert will be on by buzzer. The gas sensor scan automatically in the indoor gas and The data will be automatically uploaded towards the Thing speak server and switch on the fan to pulled out the pollution gas in the indoor environment to avoid air pollution in the industry. The future scope of project will be installed in the real time industrial support with reducing the pollution avoidance in industry and it also helps to reduce the accidental damages in factory.

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