

Original Article

IoT Based Smart Monitoring and Controlling System for Gas Leakage in Industries

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Abstract - The main objective of the work is to design a microcontroller-based toxic gas detecting and alerting system. The ultrasonic sensor is used to determine if gas is present in the ambient or not by analyzing the acoustic waves. The MQ-135 gas sensor is used to identify the leakage of gas. The IoT part of the system deals with the connectivity of the entire system to the Blynk platform via the Wi-Fi module of the NodeMCU microcontroller.

The emergency actions are automated, and detection is predicted using two preset threshold values of gas pressure in case of gas leakage. The system enables monitoring and alerting gas leakages in industries before the accident could occur, leading to a faster response time in the event of a leakage condition. The availability of the Blynk cloud platform makes it easier to collect regular data and generate useful insights from it. The results from the accumulated data of the ultrasonic sensor let us automate security actions before the conditions go out of control.

An IoT - based smart control and monitoring system for industrial gas leakage problems is proposed with the ability to monitor the pipelines, store the pressure levels and generate insights based on recorded data. The key idea of the system is to generate notifications and alarms based on the preset threshold value to show an increase in safety. The IoT part of the system deals with the connectivity of the entire system to the Blynk platform via the Wi-Fi module of the NodeMCU microcontroller. The online platform provides a range of tasks that can be done. From data visualization to automation, Blynk provides multiple facilities to carry out our essential operations in the project. As a part of our system, the online platform helps us to read, record, and analyze the data received from the microcontroller unit. The e-mail notification is also initiated through this online mobile application.

Keywords - Automated action, Alert Notifications, Blynk Cloud platform, Gas Leakage, Smart Control System.

1. Introduction

Gases are important in most industrial processes like catalysts, fuels, or raw materials. These gases can be very lethal when mishandled. Leakage is always a serious problem when gases are used. Maintaining gas pipelines and storage devices is a crucial role in all industries. Gas leakage accidents from history tell us how severe the effects of exposure can be. The Bhopal Gas Tragedy and Vishakhapatnam Gas Leak are two major accidents that created great chaos.

The rise of connectivity methods like Bluetooth, Wi-Fi, and many such wireless sensor methods facilitated the industries by improving the control systems' time, speed and accuracy. This paper proposes an IoT- based smart control and monitoring system for industrial gas leakage problems with the ability to monitor the pipelines, store the pressure levels and generate insights based on recorded data. The key

idea of the system is to generate notifications and alarms based on the preset threshold value to show increases in safety.

The system also features automated quick e-mail notifications, an alarm, and an indicator when the leakage has occurred. Within a certain period, the doors are also closed to prevent the spread of the gas. The door is still made to be manually accessible.


2. Literature Survey

Industrial IoT has eased the problems they've been facing with the availability of smart connectivity and automation of treacherous tasks. Industrial gas leakage is one of those complex tasks that must be handled. Manual methods are already being replaced. This section mentions the recent methods introduced to meet the existing challenges.



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