



# JDEBM

Journal of Digital Engineering and Business Management

## Journal of Digital Engineering and Business Management



**Volume-1, Issue-1, July 2025**  
**Inaugural Edition**  
**Published by: D3 PUBLISHERS**

# SECURING INDUSTRIAL ENVIRONMENTS WITH ARDUINO-POWERED IOT SOLUTIONS

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**ABSTRACT:** The Internet of Things (IoT) has enabled a number of improvements in infrastructure systems, such as smart homes, smart grids, water networks, and transportation, among many others. By facilitating seamless information transfer and communication across multiple devices, the Internet of Things (IoT) makes smart administration and monitoring possible through the use of embedded, networked gadgets. By fusing a WIFI module with Internet of Things applications driven by sensors, our industrial tracking solution goes beyond this promise. This makes it possible to quickly check temperature, humidity, and gas concentration in manufacturing and commercial situations. This real-time monitoring system is an example of how the Internet of Things has the potential to completely transform industrial operations.

**Key Words:** IoT, Message Alert system, WIFI- Module, ETC...

## 1. INTRODUCTION

Humans are still the preferred method in the industrial monitoring industry because there aren't many automation options for important plant parameters like temperature, humidity, and gas levels. This poses significant challenges, especially in industrialized areas where dangers could result from inadequate monitoring. Employees frequently exacerbate these issues, which has a detrimental impact on efficiency and safety. The combination of IoT technology with industrial robotics has become a ground-breaking solution to this problem by automating procedures and reducing the possibility of human error. Wireless Sensor Networks (WSN) are a key component of many high-tech Internet of Things applications, such as surveillance, habitat analysis, and environmental monitoring, because they collect data on a wide range of physical events in real time. These advances

revolutionize industrial processes while simultaneously increasing precision and reliability, enabling the adoption of safer and more intelligent practices.

## 2. EXISTINGSYSTEM

Installing a ZigBee and GSM-powered home security system with tracking and remote control capabilities. A ZigBee and GSM-based home security monitoring and control system was developed by Arbab Waheed Ahmad, Naeem Jan, Saeed Iqbal, and Chankil Lee. Humans have always required to do actions that provide them a sense of security and control over their own lives.

To make the current technology more reliable, real-time, remotely usable, and capable of worldwide coverage, it must be improved.

**INDUSTRY-BASED SECURITY SYSTEM USING GSM AND ARDUINO**

This article was written with assistance from Pratiksha Patil, Shubenham Raut, Avinash Gaikwad, and Mudaliyar Raghurajan. Use the comprehensive instructions in this article to quickly and easily create a tracking and surveillance system that is based on GSM technology.

### 3. PROPOSED SYSTEM

An Arduino-connected Internet of Things (IOT) industrial security system can help businesses reduce the possibility of monetary losses due to accidents. Explosions and other property damage could happen when gas leaks in areas like fireplaces where fire detection is crucial. Businesses may sustain catastrophic losses due to flames. In addition to making working conditions less safe, poor visibility also raises the risk of accidents. This feature is integrated directly into the system using Arduino. The system is designed to make factories safer and reduce accidents and losses by monitoring for things like fires, gas leaks, temperature fluctuations, and inadequate illumination. This is accomplished by the system's design. The set consists of temperature, gas, and light sensors in that order. The abbreviation LCD stands for liquid crystal display. You also receive an Arduino board.

#### HARDWARE REQUIREMENTS

- ARDUINOUNO
- LCDDISPLAY
- WIFIMODULE
- LDRSENSOR
- GASSENSOR
- TEMPERATURESENSOR
- RELAY
- POWERSUPPLY

#### SOFTWARE REQUIREMENTS

- ARDUINOIDE
- EMBEDDED C

#### MODULE DESCRIPTION

- The module is divided into three parts
- Power supply
- Hardware connections
- Software interfacing

#### POWER SUPPLY

The power supply mainly consists of our parts

- Electrical Transformer
- Rectifier Diode
- Electrolytic Capacitor
- LM7805 Voltage Regulator

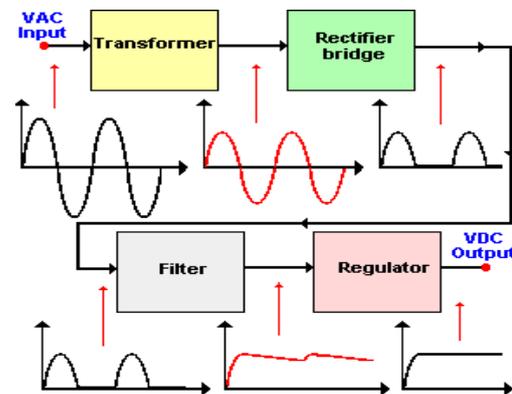


Fig-1: Obtaining a source of energy

#### ELECTRICAL TRANSFORMER

Two methods are used to transfer electricity through a transformer: alternating current is applied to the primary winding, and a lower voltage is applied to the secondary winding.

The intended DC output voltage and the actual AC output voltage need to be exactly same.

#### RECTIFIER DIODE

The secondary winding's alternating current voltage is changed into a pushed-current direct current via the rectifier bridge. And look at the photo. In this particular instance, a 12-wave converter is utilized to eliminate the wave's negative half.



point, the sensors begin to function. A gas sensor is invaluable when monitoring changes in the concentration of hazardous gases is essential for system safety and warning individuals of any unforeseen hazards. This is due to the fact that monitoring changes in the concentration of hazardous substances is essential to ensuring the security of the system.



### FIRESENSOR

This small infrared detector module can detect light or fire sources with wavelengths ranging from 760 to 1100 NM. It works and is compatible with Arduino within an NM range. Its ability to detect a lighter flame up to 80 cm distant is another characteristic.

The distance that has to be measured decreases with increasing flame temperature. It has a sixty-degree sensor angle and is capable of accurately detecting the flame spectrum.

### SOFTWARE REQUIREMENTS

- ARDUINOIDE
- EMBEDDED C

### ARDUINOIDE

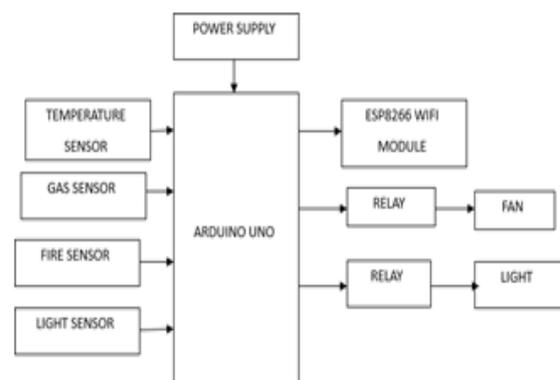
The Arduino Integrated Development Environment (IDE), sometimes known as the Arduino Software (IDE), is a tool that helps you create code. A text terminal, a message box, a toolbar with icons for frequently used operations, and more menu options are some of its features.

Connecting the Arduino to the physical hardware enables the addition of applications and their interaction.

### TOOLS

- ARCHIVESKETCH
- FIXENCODINGAUTOFORMAT&RELOAD
- SERIALMONITOR
- BOARD
- PORT
- BURNBOOTLOADER

### BLOCKDIAGRAM

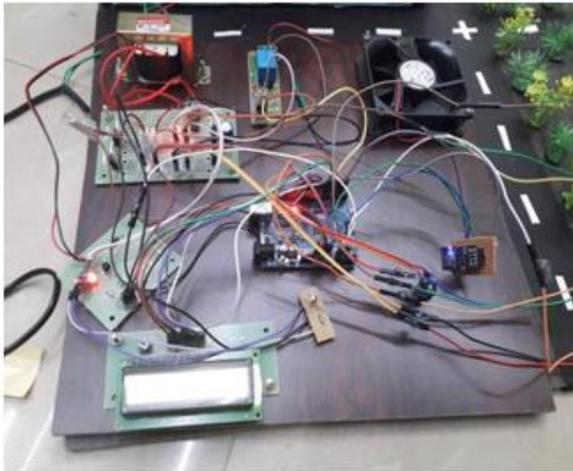


### 4. CONCLUSION

This research focuses on a smart Wireless Sensor Network (WSN) device that was constructed using the Internet of Things (IoT). Its objective is to keep an eye on crucial safety indicators in industrial environments. This technology is ideal for high-rate IoT data gathering systems because of its intelligent real-time sensor data collection and streamlined wireless connection procedures. The Arduino Uno, which has made it simple to connect a wide range of sensors that can communicate with other linked devices, has enabled the design's increased versatility and scalability. A practical illustration of the system's use inside an IoT framework is the monitoring of signals pertaining to workplace safety. The innovative potential of this state-of-the-art

smart sensor interface device to enhance industrial safety monitoring is demonstrated by both its efficacy and the opportunities it presents for further research in WSN and Internet of Things applications.

## 5. RESULT



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