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Industry Protection Using IOT

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ABSTRACT –

An Industry Protection System using IoT is a smart system designed to keep factories and industrial areas safe. It uses sensors and devices connected to the internet to monitor things like fire, gas leaks, temperature, and motion. If something goes wrong, the system quickly sends alerts to the authorities or workers through mobile apps or alarms. This helps prevent accidents, protect equipment, and ensure the safety of people in the workplace. The system runs automatically and can be checked and controlled from anywhere, making it a reliable and modern safety solution.

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

1. INTRODUCTION

The Industry Protection System using IoT is a smart solution designed to improve safety in factories and industrial areas. It uses internet-connected sensors and devices to constantly check for dangers like fire, gas leaks, high temperatures, or unauthorized access. When a problem is detected, the system quickly sends alerts to workers or authorities, helping to prevent accidents and damage. This system can be monitored and controlled remotely, making it easy to manage safety in real-time. Overall, it helps protect people, equipment, and the environment in a more efficient and modern way.

1.1 EXISTING SYSTEM

An existing Industry Protection System using IoT with NodeMCU ESP32 is a smart safety setup used in factories. It includes the ESP32 board, which connects to the internet and controls sensors like gas detectors, fire sensors, temperature sensors, and motion detectors. These sensors keep checking the environment for any danger. If a problem is found, the ESP32 sends alerts through Wi-Fi to a mobile app and also triggers alarms like buzzers. This system helps monitor the factory in real-time, keeps workers safe, and can even shut down machines during emergencies.

1.2 PROPOSED SYSTEM

The proposed Industry Protection System using IoT is designed to make factories safer and smarter. It will use the NodeMCU ESP32 to connect various sensors like gas, fire, temperature, and motion sensors. These sensors will keep watching for any danger in real-time. If something goes wrong, the system will immediately send alerts to a mobile app and sound an alarm. It can also control machines by turning them off in emergencies. The system can be monitored from anywhere using the internet, helping to prevent accidents, protect workers, and reduce damage.

2. HARDWARE REQUIREMENTS

- NODE MCU ESP 32
- MOTION SENSOR
- MQ3 SENSOR
- BUCK CONVERTER
- GAS SENSOR
- DHT11 SENSOR
- RELAY

- POWER SUPPLY

3. SOFTWARE REQUIREMENTS

- BLYNK CONSOLE
- 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 four parts

- Electrical Transformer
- Rectifier Diode
- Electrolytic Capacitor
- LM8705 Voltage Regulator

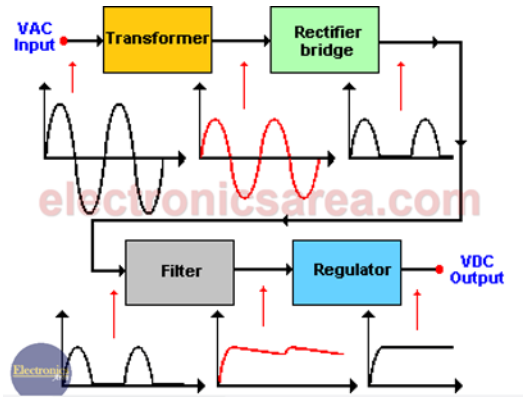


Fig -1: power supply

ELECRTRICAL TRANSFORMER

The electrical transformer receives on the primary winding an AC voltage and delivers on the secondary winding a different AC voltage (a lower one). This AC output voltage must be according to the DC voltage we want to obtain at the end.

RECTIFIER DIODE

The rectifier bridge transforms the secondary winding AC voltage into a pulsating DC voltage. (look at the diagram). In our case, we use a ½ wave rectifier, then we eliminate the negative part of the wave

ELECTROLYTIC CAPACITOR

Filter are one or more electrolytic capacitors in parallel that flattens or smooths theprevious wave eliminating the alternating current (AC) component delivered by the rectifier. These capacitors are charged to the maximum voltage value that the rectifier can deliver, and they are discharged when the pulsating signal disappears

LM8705 VOLTAGE REGULATOR

The voltage regulator receives the signal from the filter and delivers a constant voltage (let's say 12 DC volts) regardless of the variations on the load or the voltage supply. Voltage regulator can be implemented in several ways. It can be a transistorized voltage regulator or a monolithic voltage regulator. The image below shows the LM7805 voltage regulator (5VDC output). You can also find the LM7812 voltage regulator (12VDC output).

HARDWARE CONNECTONS

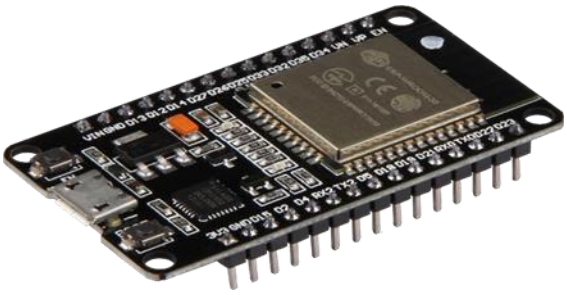
In this section, The system contains several sensors for measurement of parameters. The sensors used in this project is PIR sensor,MQ3 sensor,DHT11 sensor, Flame sensor,

THE MAJOR HARDWARE COMPONENTS ARE

- NODE MCU ESP32
- MQ3 SENSOR
- PIR SENSOR
- FIRE SENSOR
- DHT11 SESSOR

NODE MCU ESP32

In the Industry Protection System using IoT, the **NodeMCU ESP32** works as the main controller. It connects to different sensors like gas, fire, temperature, and motion sensors. These sensors send data to the ESP32, which checks if there is any danger. If it finds a problem, the ESP32 sends alerts through Wi-Fi to a mobile app or website and also turns on alarms like buzzers or lights. It can even control machines by turning them off during emergencies. Because the ESP32 has built-in Wi-Fi, it allows the system to be monitored and controlled from anywhere in real-time.



MQ3 SENSOR

In the Industry Protection System using IoT, the **MQ3 sensor** is used to detect alcohol or gas leaks in the air. It senses the presence of gases like alcohol, ethanol, and LPG. When the gas level goes above a safe limit, the sensor sends a signal to the NodeMCU ESP32. The ESP32 then sends an alert to a mobile app and can also turn on a buzzer or warning light. This helps in quickly detecting dangerous gas leaks and keeping the factory environment safe.

PIR SENSOR

In the Industry Protection System using IoT, the **PIR (Passive Infrared) sensor** is used to detect human movement. It senses infrared (heat) signals from the human body. When someone moves in front of the sensor, it sends a signal to the NodeMCU ESP32. The system then triggers an alert, such as a buzzer or a message on the mobile app. This helps detect unauthorized access or movement in restricted areas, making the factory more secure.

FIRE SENSOR

This tiny Flame sensor infrared receiver module ignition source detection module is Arduino compatible can use to detect flame or wavelength of the light source within 760nm~1100nm also useful for Lighter flame detect at the distance 80cm Greater the flame, farther the test distance. It has the Detect angle of 60 and very sensitive to flame spectrum

DHT11 SENSOR

In the Industry Protection System using IoT, the **DHT11 sensor** measures temperature and humidity in the factory. It sends this data to the NodeMCU ESP32, which checks if the temperature is too high or humidity is unsafe. If it detects a problem, the system sends an alert to warn workers and can trigger alarms. This helps prevent overheating and keeps the industrial environment safe.

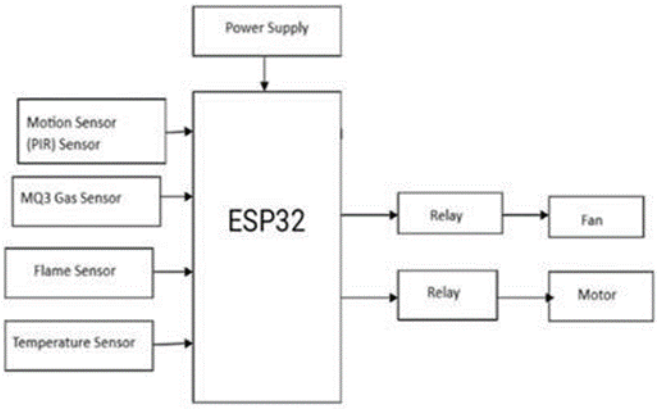
SOFTWARE REQUIREMENTS

- BLYNK CONSOLE

BLYNK CONSOLE

Blynk Console software connects the Industry Protection System to the internet, allowing real-time monitoring of sensor data on smartphones or computers. It sends instant alerts when hazards like fire or gas leaks are detected and lets users remotely control alarms and machines, helping keep the factory safe from anywhere.

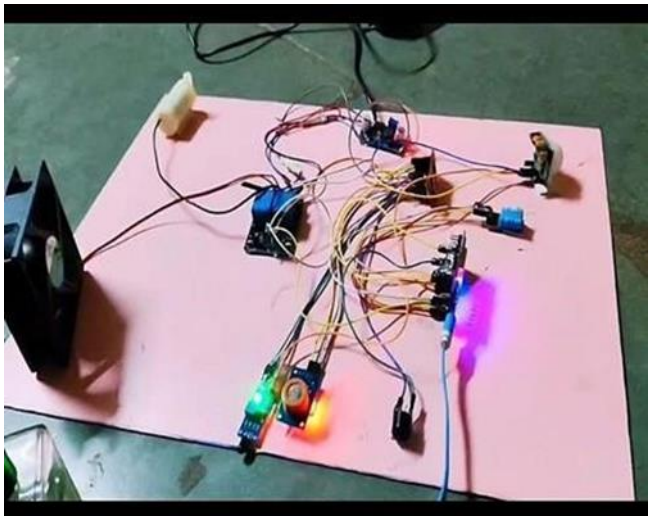
BLOCK DIAGRAM



CONCLISION

The Industry Protection System using IoT offers an efficient and reliable way to enhance safety in industrial environments. By integrating sensors with the NodeMCU ESP32, the system continuously monitors critical factors such as gas leaks, fire, temperature changes, and unauthorized movements. When a potential hazard is detected, it instantly alerts the concerned personnel through mobile notifications and activates alarms to prevent accidents. This real-time monitoring and remote control capability help protect workers, reduce damage to equipment, and improve overall safety management. With its smart and automated approach, the system represents a significant advancement in industrial safety technology.

RESULT



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