

Project Idea Submission Form

Student Ids
1505080, 1505089
Project Name
Automated Industrial Safety Management System
Brief Project Description
<p>The industrial safety management is in most cases done manually and it's mainly damage control rather than taking quick steps to minimize the damage as much as possible. In this situation, our project presents an exclusive solution for an automated industrial safety management which can be used at industries for quick detection of a combustible gas leak, fire, smoke or toxic gas and provide safety from the effects with adequate safety procedures.</p> <p>We are mainly using GAS Sensor (MQ-5) for detecting Gas Leakage in normal line, Smoke Sensor Module (MQ-2) for detecting smoke and Grove - Air quality sensor v1.3 to detect toxic gas and both Smoke and Temperature Sensor (LM35) for detecting fire outbreak.</p> <p>There will be multiple set of sensors at different places of the industry and there will be one master module to control the actuators. Communication between the sensors and the master module will be conducted using NRF24L01 RF Board. In this way, we can also detect which part of the industry has been affected.</p> <p>The action which will be taken after detection of smoke, fire, gas or toxic gas leakage are given below:</p> <p>Gas Leakage (detected using MQ-5)-</p> <ol style="list-style-type: none">1. Turn on the Alarm, LED, display appropriate message in LCD Screen2. Cut-Off the Gas line (Using 12 V Solenoid Valve)3. Cut-Off the Main Electricity Line, Use Backup Line to run the Safety Module only (using Relay Switch)4. Start the Exhaust Fan. <p>Fire Outbreak (detected using MQ-2 and LM35)-</p> <ol style="list-style-type: none">1. Turn on the Alarm, LED, display appropriate message in LCD Screen2. Cut-off the Gas line (Using 12 V Solenoid Valve)3. Spray Water using Water Pump DC-12V

Toxic Gas Detection (detected using Air quality sensor v1.3)-

1. Turn on the Alarm, LED, display appropriate message in LCD Screen
2. Turn on the Exhaust Fan

With this system, it might be possible to automate industrial safety, minimize damage and save lives.

List of sensors/input devices used

1. Gas Sensor (MQ-5) : <https://www.techshopbd.com/product-categories/gas/1631/smoke-sensor-mq-5-techshop-bangladesh>
2. Smoke Sensor Module (MQ-2) : <https://www.techshopbd.com/product-categories/gas/1041/smoke-sensor-module-mq-2-techshop-bangladesh>
3. Grove - Air quality sensor v1.3 : <https://www.techshopbd.com/product-categories/gas/1182/grove-air-quality-sensor-v1-3-techshop-bangladesh>
4. LM35 Temperature Sensor Module : <https://www.techshopbd.com/product-categories/temperature/1691/lm35-temperature-sensor-module-techshop-bangladesh>
5. Push Button

List of Actuators/output devices used

1. Water Pump DC-12V : <http://www.roboticbd.com/product/water-pump-dc6v-12v/>
2. DC Fan 12V (3.1in) : <https://www.techshopbd.com/product-categories/dc-fan/251/dc-fan-12v-3-1in-techshop-bangladesh>
3. 12V Solenoid Valve - 3/4" : <https://www.techshopbd.com/product-categories/solenoid/1357/12v-solenoid-valve-3-4-techshop-bangladesh>
4. Solid State Relay : <https://www.techshopbd.com/product-categories/relay/2786/solid-state-relay-techshop-bangladesh>
5. RF Module : NRF24L01 RF Board : <https://www.techshopbd.com/product-categories/rf/1431/nrf24l01-rf-board-b-pair-techshop-bangladesh>
6. LCD Display
7. LED
8. Buzzer

Miscellaneous & Discussion (If Any)