



MPCA Project

**Department of Computer Science &
Engineering
Microprocessor & Computer
Architecture**

UE22CS251B

**Project Title : Smart kitchen-An IOT
based project**

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Abstract:

In this project, we will build an IoT Based Smart Kitchen with Automation & Monitoring System using NodeMCU ESP8266. The kitchen is one of the important places in a house. The safety factor is the main aspect that must be taken into account during the activity in the kitchen. The existence of gas leakage, uncontrolled fire, excessive temperatures & a moist environment must be quickly identified and addressed.

The main motto of this project is to make a prototype of an IoT Based Smart Kitchen using the Internet of Things. The system uses multiple sensors, relays & NodeMCU ESP8266 Board. We can monitor all the sensor data on a Mobile Application. We can also send the command from a Mobile Application to control Kitchen Appliances.

Basically, the IoT Smart Kitchen does the following tasks:

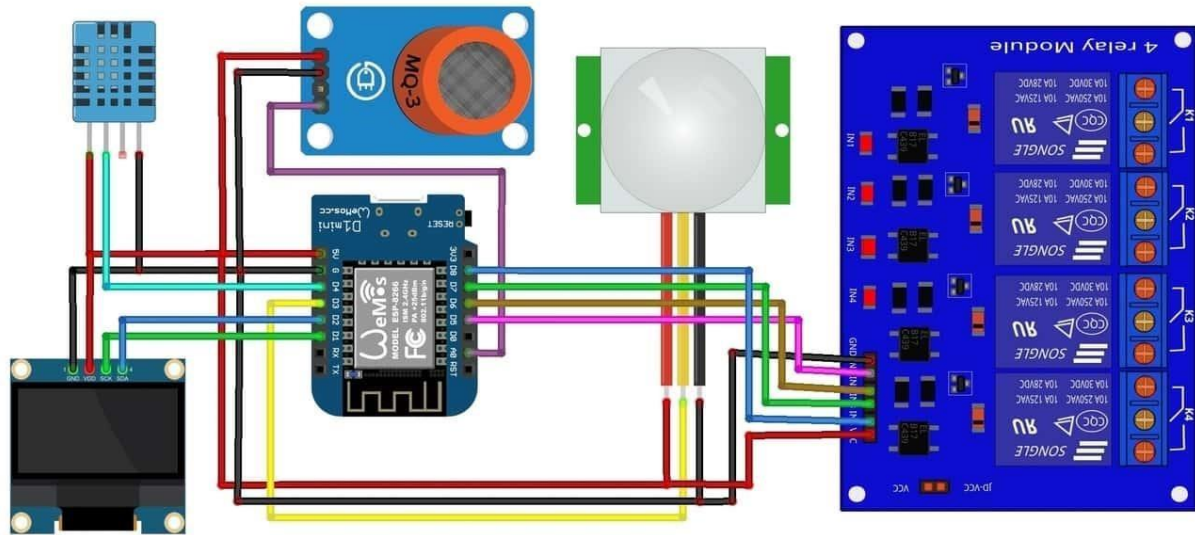
- Monitor the Kitchen Temperature & Humidity using DHT11 Sensor on A Mobile Application.
- Monitor the Air Quality Index (Gas) using MQ-135 Gas Sensor on A Mobile Application.
- Displays the Kitchen Temperature, Humidity & Gas Level on LED Display.
- The exhaust fan turns ON & the Alarm activates, once Gas level exceeds.

System Components:

1. Wemos D1 Mini Board or NodeMCU ESP8266 Board (ESP8266-12E based)
2. Humidity-Temperature Sensor
3. Gas Sensor
4. Smoke Sensor
5. Buzzer
6. Relay Modules
7. LED Display
8. Jumper wires
9. Breadboard (for prototyping)

System Architecture

Block Diagram of the System:



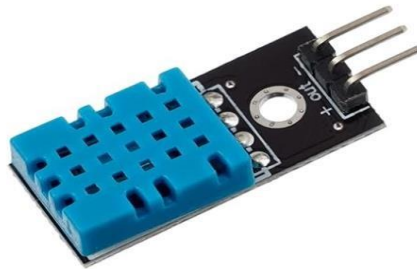
Description of Components Integration:

1. NodeMCU ESP8266 Board (ESP8266-12E based)



The NodeMCU is a development board based on the ESP8266 microcontroller. The ESP8266 is a low-cost Wi-Fi module that gained popularity for its ability to provide internet connectivity to microcontroller-based projects. NodeMCU is built around this chip and provides a convenient platform for rapid prototyping and development of IoT (Internet of Things) applications.

2. Humidity-Temperature Sensor



This sensor is basically a cost-efficient digital humidity & temperature sensor. This sensor supplies digital output and therefore can be directly connected to data pins of microcontroller. It also consists of 8-bit microcontroller to provide values of temperature & humidity in the form of data that is serial.

3. Gas Sensor



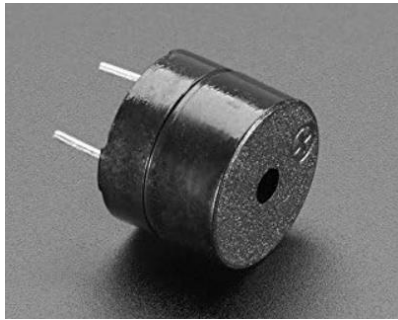
MQ2 gas sensor can be used to detect the presence of LPG, Propane and Hydrogen, also could be used to detect Methane and other combustible steam, it is low cost and suitable for different application. Sensor is sensitive to flammable gas and smoke. Smoke sensor is given 5 Volt to power it. Smoke sensor indicate smoke by the voltage that it outputs. More smoke more output.

4. Smoke Sensor



A smoke sensor, also known as a smoke detector or smoke alarm, is an electronic device designed to detect smoke and issue an alarm to alert occupants of a building about potential fire hazards. These sensors are a critical component of fire detection and alarm systems, helping to save lives and minimize property damage by providing early warning of fire incidents.

5. Buzzer



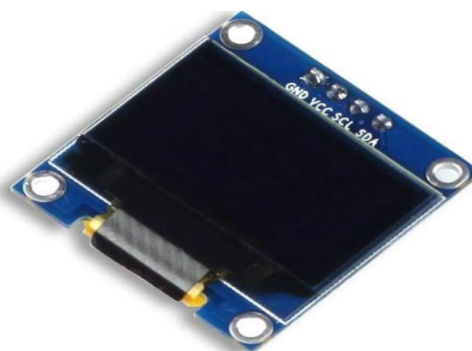
A buzzer is a simple electroacoustic device that produces a buzzing or beeping sound when an electric current passes through it. It typically consists of a vibrating element, such as a diaphragm or a piezoelectric element, housed within a casing. When an electrical signal is applied to the buzzer, it causes the vibrating element to oscillate, generating sound waves in the audible frequency range.

6. Relay Modules



A Relay is a device that opens or closes an auxiliary circuit under some pre-determined condition in the Main circuit. The object of a Relay is generally to act as a sort of electric magnifier, that is to say, it enables a comparatively weak current to bring in to operation on a much stronger current. Relays are the switches which aim at closing and opening the circuits electromechanically.

7. LED Display



LED displays, short for Light Emitting Diode displays, are electronic visual display boards that use an array of light-emitting diodes to display text, graphics, or video content. These displays have become ubiquitous in various applications, ranging from digital billboards and advertising signage to electronic scoreboards, information displays, and even consumer electronics.

8.Jumper wires

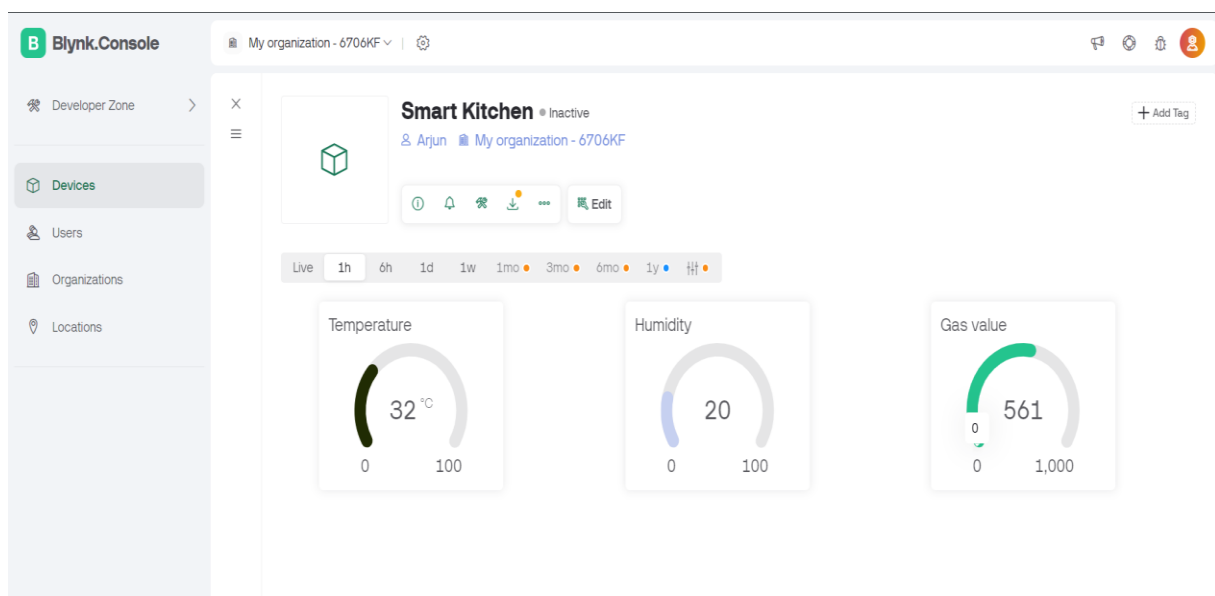
Jumper wires are simple electrical wires with connectors at each end, commonly used in electronics and prototyping projects to establish connections between various components on a breadboard or circuit board. They serve as flexible conductive pathways, allowing signals, power, and ground connections to be easily made and modified during the development and testing phases of electronic circuits.

9.Breadboard (for prototyping)

A breadboard is a fundamental prototyping tool used in electronics to create temporary circuits without the need for soldering. Consisting of a grid of interconnected metal clips beneath its surface, a breadboard allows electronic components to be inserted and connected through jumper wires, enabling rapid experimentation, testing, and design iteration. It serves as a versatile platform for assembling and testing circuits, making it indispensable for hobbyists, students, and professionals alike in the field of electronics engineering.

Output and Report:

Real-time tracking - Blynk website console output

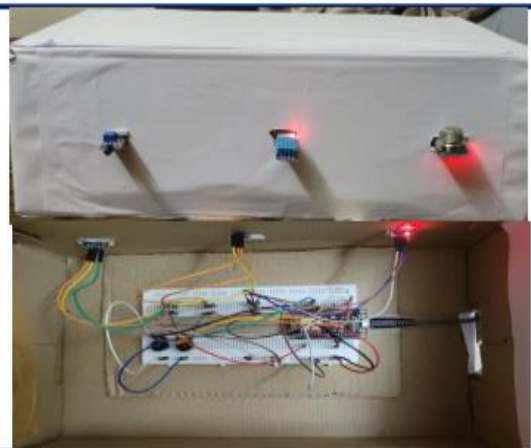
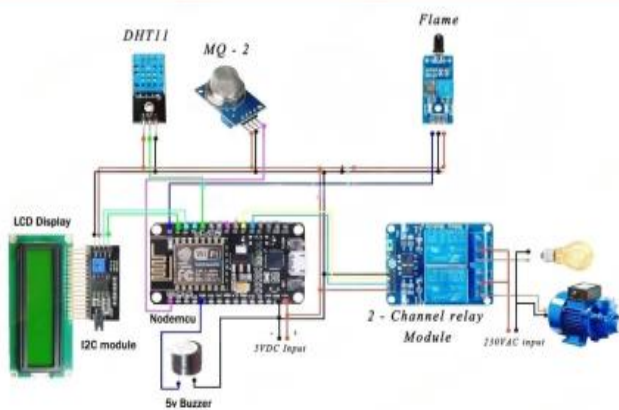


UE22CS251B:MPCA 4th Semester F-Section

Smart Kitchen



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