

# **IOT ENABLED POWER MONITORING AND CONTROL OF SINGLE-PHASE INDUCTION MOTOR**

<https://www.youtube.com/watch?v=5z8QzNDj7E0>

## **ABSTRACT:**

This IoT-based system for real-time monitoring and control of a single-phase induction motor leverages an Arduino Uno as the central controller, interfaced with various essential components. The system integrates an LCD display for immediate feedback, a Wi-Fi module for remote access and management, and a PZEM module to monitor electrical parameters such as voltage, current, and power. A temperature sensor tracks the motor's thermal conditions, while a hall effect sensor provides accurate rotational speed data. Additionally, a relay facilitates motor operation control. This comprehensive setup ensures efficient, remote management and operational reliability, enhancing motor performance and safety through continuous, data-driven insights.

## **Objectives**

- To monitor the voltage, current, power, temperature, and speed of a single-phase induction motor in real time.
- To implement IoT-based remote monitoring and control using a Wi-Fi module.
- To display motor parameters locally on an LCD screen.
- To measure motor speed accurately using a Hall Effect sensor.
- To monitor motor temperature and prevent overheating.
- To control motor operation through a relay module.
- To improve motor efficiency, reliability, and safety through continuous monitoring.
- To provide data-driven insights for predictive maintenance and fault detection.

## **The main blocks of this project are:**

- Power supply.

- Arduino UNO.
- ESP8266 WI-FI module.
- LCD display.
- PZEM module specifications.
- Hall effect sensor.
- Temperature sensor.
- Single phase motor.
- Relay.

**Software's used:**

- 1.Embedded C programming.
- 2.Arduino IDE Studio compiler for dumping code into Micro controller.
3. Express SCH for Circuit design.

**Block diagram:**

