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IOT Based Motor Monitoring System

Mr. Sangram .S. Mane

Naina .B. Antad, Sushmita .V. Kolkar, Bhanu .B. Meragu, Sakshi .V. Rangrej, Jyoti .S. Swami,

Electrical Engineering, Shri Siddheshwar Women's Polytechnic Solapur

Electrical Engineering, Shri Siddheshwar Women's Polytechnic Solapur

Electrical Engineering, Shri Siddheshwar Women's Polytechnic Solapur

Electrical Engineering, Shri Siddheshwar Women's Polytechnic Solapur

Electrical Engineering, Shri Siddheshwar Women's Polytechnic Solapur

Electrical Engineering, Shri Siddheshwar Women's Polytechnic Solapur

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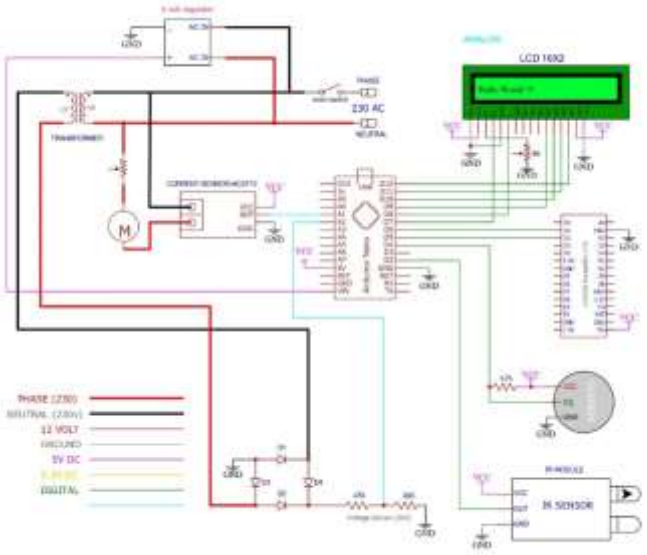
ABSTRACT

An overview of IoT-based motor monitoring and control is provided here:"IoT-based motor monitoring and controlling is a state-of-the-art system that remotely monitors and controls motor performance in real-time by leveraging sensors, cloud computing, and analytics. This cutting-edge solution lowers downtime and operating expenses by enabling predictive maintenance, energy efficiency, and better uptime. By embracing IoT capabilities, industries may optimize motor performance, boost efficiency, and assure seamless operations.

***Key Words*:**
Real-time monitoring of motor performance.
Reduces downtime and operating expenses.
Optimizes motor performance and reduces costs.
Ensures seamless operations.
Boosts efficiency and motor performance.



IOT BASED MOTOR MONITORING SYSTEM

INTRODUCTION

The most extensively used motor type across all diligence at the moment is the induction motor. Nikola Tesla, the famed scientist, constructed the induction motor. Around half of the world's electric power operation is attributable to induction motors. Induction motors are used by 90 of druggies in assiduity due to their essential" tone- launch" point, which eliminates the need for skirmishes, commutator rings, position detectors, and endless attractions.

1. Objective

To Real-time motor monitoring, breakdown prediction and prevention, and energy conservation are the goals of this study. The project also intends to send out notifications for any problems, analyze data for improvement, and enable remote control of motors. The initiative also aims to maximize motor uptime, save maintenance costs, and guarantee motor safety. The overall objective is to increase the cost-effectiveness, dependability, and efficiency of motor operations.

2. Working

Among the many features provided by an IoT-based motor monitoring and controlling project setup are monitoring and controlling capabilities. In addition to sensor data monitoring for current, voltage, temperature, and vibration, monitoring functions allow real-time motor status monitoring, including on/off state, speed, and direction. Motor performance monitoring also keeps tabs on parameters including torque, power factor, and efficiency. Controlling features enable automatic control based on sensor data and preset rules, as well as remote motor control via smartphones or tablets. To further avoid damage and guarantee safe operation, motor protection features including overcurrent, overvoltage, and overheating prevention can be added.

3.Working Principal of Fuel Cell

Data from the sensors, which gauge various motor characteristics, is sent to the MCU. Before transferring the data to the cloud platform, the MCU processes it using the communication module. The cloud platform handles the processing, storing, and analysis of the data. Utilizing the user interface, the user interacts with the system by sending commands to the cloud platform. The cloud platform sends commands to the MCU via the communication module. Following command receipt, the MCU sends control signals to the motor.

4. Methodology

1. **Arduino:** Just all that the Arduino Uno is is a developer board. In addition to the digital controller, it contains its own PCB, ROM, RAM, and analog.
2. **Temp sensor:** The analog output voltage of this temperature-measuring device is proportional to the temperature.
3. **Speed sensor:** The BT139 Triac is a semiconductor device with a high bidirectional transistor, high blocking voltage capability, and plastic envelope packaging.
4. **LCD:** An LCD is a module for electronic screen display. This suggested solution uses a 16*4 type of LCD to continuously display the induction motor's monitored value.

5. Results and Discussion:

1. **Reduced downtime**: Predictive maintenance enables prompt issue detection and resolution.
2. **Lower operating expenses**: Energy efficiency and optimized performance reduce costs.
3. **Enhanced efficiency**: Motor performance is optimized by real-time monitoring and analytics.

6.Advantages :

1. Predictive maintenance is made possible by real-time motor performance monitoring, which lowers downtime and boosts total output.
2. IoT-based systems optimize motor performance in real-time for maximum efficiency and reduced energy consumption.

7. Limitations and Challenges

1. It is costly to implement IoT-based motor monitoring systems, particularly for small-scale applications.
2. IoT-based systems need to be installed, configured, and maintained by professionals.
3. Integration into a single system is hampered by the frequent incompatibilities between IoT devices and systems.

8. Conclusion:

An innovative technology that has revolutionized the monitoring, control, and maintenance of motors is Internet of Things-based motor monitoring and controlling. Industries can increase overall production, decrease downtime, and improve motor efficiency by utilizing the Internet of Things.

9. Future Scope

1. Smart Motor Systems: Enhance motor intelligence through real-time performance monitoring, energy efficiency optimization, and failure prediction.
2. Smart Motor Systems: Enhance motor intelligence through real-time performance monitoring, energy efficiency optimization, and failure prediction.
3. Enhanced Security: Strengthen cyber security defenses against data breaches and hacking of motor systems.

10. References

[1] https://www.youtube.com/watch?v=GHfr_8nRH6o (IOT based motor monitor)