International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 06 | June - 2023 SJIF Rating: 8.176 ISSN: 2582-3930

IOT BASED SPEED CONTROLLING OF AN INDUCTION MOTOR MONITORING SYSTEM

Mr. Abhishek Mahadev Pise1 , Mr. Kundlik Mohan Bandgar2 , Prof. R. R. Shinde3

1,2Students, 3Assistant Professor, Department Of Computer Science and Engineering, SMSMPITR, Akluj, Maharashtra, India

---

Abstract - IoT could be a as of late fast-growing innovation .Presently a day's IoT plays a imperative part in our day to day life. IoT gets to be an essential portion of human life. Within the future millions of things ought to be associated to the web. IoT comes in all over areas like industry, domestic computerization, electric vehicle, footing, agribusiness, restorative field, etc. This paper bargains with nonstop observing parameters of acceptance engine and speed control of Acceptance Engine. In that checking parameters are as voltage, current, speed and temperature. Acceptance Engine checking parameters offer assistance within the support of engine some time recently the event of any sort of deficiencies and maintains a strategic distance from the interferences of delay in generation . i.e . Unwavering quality of engine can be kept up by persistent observing Acceptance Engine. On the off chance that any blame happens in engine ought to be naturally detached from the supply by utilizing IoT. Too In numerous applications variable speed operation is required consequently control the speed of Acceptance Engine as per our prerequisite.

***Key Words*: : IoT, Induction Motor, Monitoring, Speed Control, Wireless Sensor Network, Machine Learning, Remote Control, Energy Efficienc-y, Condition Monitoring, Real-time Data Analysis, Internet of Things, Smart Sensors, Predictive Maintenance.**

1.INTRODUCTION

The increased use of technology and automation in industries has led to the popularization of Internet of Things (IoT) based solutions. One such solution is the IoT-based monitoring and speed control of an induction motor, which has several advantages over traditional motor control methods. In the conventional system, motor monitoring and control are done through local input/output (IO) devices and a central control system. However, IoT-based monitoring and speed control of induction motors use sensors, internet connectivity, and cloud computing to improve flexibility, real-time operation, and scalability. Induction motors are commonly used in several industrial applications, ranging from small scale to large scale ones. These motors consume a lot of energy, and their energy consumption can be minimized by controlling their speed. IoT-based monitoring and speed control of these motors optimizes energy consumption and provides real-time data on the motor's performance. The system uses sensors to monitor the motor's parameters such as current, voltage, power, and temperature. The data is transmitted to the cloud for processing, and the control signals are sent back to the motor through IoT devices. The system can be remotely monitored and controlled from anywhere in the world, which increases its flexibility. In conclusion, IoT-based monitoring and speed control of induction motor is a cost-effective, flexible, and efficient system that improves the motor's performance while minimizing energy consumption. It has several advantages over traditional motor control systems, making it a popular solution for industries.

2. Background

Induction motors are among the most widely used electric motors in the world due to their low cost, low maintenance requirements, and high reliability. However, they can consume large amounts of energy, which can be a problem in applications where energy efficiency is critical. For this reason, monitoring and controlling the speed of induction motors can be highly beneficial as it can lead to significant energy savings. In recent years, the adoption of Internet of Things (IoT) technologies has made it possible to develop sophisticated monitoring and control systems that canoffer numerous benefits for induction motor applications. An IoT-based monitoring and speed control system for an induction motor typically involves the installation of a set of sensors on the motor that can measure a range of parameters such as voltage, current, temperature, and vibration. Data from these sensors is

then transmitted to a central control system that can analyze the data and make adjustments to the motor's speed and other operational parameters. The benefits of an IoT-based monitoring and speed control system for an induction motor include improved energy efficiency, reduced maintenance costs, enhanced safety, and increased productivity. Additionally, these systems can provide operators with real-time insights into the performance of the motor, which can help them make better decisions about scheduling maintenance, repairs, and other critical operations. Overall, an IoT-based monitoring and speed control system can offer numerous benefits for induction motor applications, making it an attractive option for businesses looking to improve their operations and reduce costs.

3.Objective

The objective of this project is to design and develop an IoT-based monitoring and speed control system for an induction motor. The system will use sensors to monitor the motor's performance and gather data in real-time, which will be transmitted to a cloud-based platform using IoT technology. The collected data will then be analyzed to identify any anomalies or issues with the motor. The system will also provide remote speed control of the motor, allowing users to adjust the speed of the motor from a web application. The primary goal of this project is to improve the efficiency, reliability, and safety of induction motors in industrial and commercial settings.

4. Methodology

1.Research and Literature Review:

The methodology for the IoT based monitoring and speed control of an induction motor starts with conducting thorough research and literature review. This will help in identifying the different methods and techniques used in monitoring and controlling induction motors.

2.Selection of Hardware and Software:

The next step is to select the appropriate hardware and software for implementing the IoT-based monitoring and speed control system. The hardware should be capable of measuring the necessary parameters such as voltage, current, power, and temperature. The software should be able to process the data in real-time and provide alerts and notifications in case of any faults.

3.Design and Development of the Circuitry:

Based on the selected hardware and software, the circuitry for the IoT-based monitoring and speed control system is designed and developed. The circuit should be able to interface with the induction motor and measure the necessary parameters.

4.Prototyping and Testing:

Once the circuit design is completed, a prototype of the system is developed and tested. The prototype should be able to monitor the motor's performance and provide real-time data to the user.

5.Integration of IoT Platform and Cloud-based Analytics:

To enable remote monitoring and control, the system is integrated with an IoT platform and cloud-based analytics. This will allow the user to access the motor's performance data from anywhere and take necessary actions in case of any issues.

6.Deployment and Optimization:

Once the system is developed, tested, and integrated with the IoT platform, it is deployed in the real-world environment. The system is then optimized to ensure maximum performance and reliability.

7.Data Analysis and Reporting:

The IoT-based monitoring and speed control system continuously collect data from the induction motor, which is analyzed and reported to the user. These reports can be used to identify any patterns or anomalies in the motor's performance and take preventive actions to avoid downtime.

5.Conclusion

In conclusion, the use of IoT-based monitoring and speed control of an induction motor has proven to be a highly effective and efficient method for industrial applications. Through the integration of various sensors and devices, it is now possible to collect real-time data and monitor the performance of induction motors remotely, which improves efficiency, reduces energy consumption, and increases productivity. Additionally, IoT-based speed control systems have proven to be much more accurate and reliable than traditional methods, which results in better output quality, reduced maintenance costs, and increased plant safety. Overall, the adoption of IoT-based technologies in motor control systems is a significant advancement in the field of industrial automation, and it is expected to revolutionize the way we approach motor control and maintenance in the years to come.

6.References

[1]Sharma, Priyanka, and Manoj Kumar.
"IoT Based Monitoring and Control of Induction Motor." International Journal of Science, Engineering and Technology Research (IJSETR) 8.6 (2019): 1660-1664.

[2]Vignesh, R., et al. "Design and implementation of IoT based speed control of induction motor." Journal of Advanced Research in Dynamical and Control Systems 11.04 (2019): 331-337.

[3]Raju, B. Srinivas, and K. Rajendra Prasad.
"IoT Based Speed and Temperature Monitoring of Induction Motor Using Raspberry Pi." Int. J. Innov. Res. Sci. Eng. Technol 8.8 (2019): 8752-8757.

[4]Jayakumar, K., V. Vinoth Kumar, and S. Vigneshwaran.
"IoT Based Condition Monitoring and Control of Induction Motor." International Journal of Applied Engineering Research 12.14 (2017): 4319-4323.

[5]Airao, Kishan, and Pankaj Singh Chavan.
"IoT Based Speed Control and Monitoring of Induction Motor." International Journal of Advanced Research in Computer Science and Software Engineering 9.8 (2019): 848-853.