

Monitoring the Induction Motor Parameters using Bluetooth Technology

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Abstract— This design project describes about the monitoring system of the induction motor with wireless technology. The maintenance of the induction motor is essential in industries for the better performance. In earlier, for monitoring the induction motor, the system uses wired communication is more expensive. The proposed can monitor the parameters of induction motor such as voltage, current, temperature and speed of the motor. The system consists of Arduino which acquires the various parameters from the motor and then measured values are given to the mobile phones through Bluetooth Technology. Current and Temperature Sensors are used to measure the current and temperature of the induction motor. The measured values are stored in mobile phone. In addition with this system the speed and voltage monitoring is also provided.

Key words: Induction Motor, Arduino, Temperature Sensor, Voltage Measuring Circuit, Proximity Sensor, Bluetooth Module

I. INTRODUCTION

In many industries, induction motors are used because of simple, reliable and safe structures. The induction motors are used to drive the mechanical system in industries like a paper mill, sugar industry, and cement industries. The maintenance of the induction motor is essential for better performance. Current, voltage, temperature and speed data of the induction motors are very important for a drive system and performance of an induction motor is directly affected by these fundamental quantities. However, during the continuous process of production, it becomes dangerous and risky operation to control the machines. In such cases, monitoring techniques become a considerable solution to eliminate these hazards. However, wired connections have limitations: they are laborious to install, ease of access is sometimes circumscribed and they depend greatly on physical surroundings.

An interruption in their operation caused by environmental factors may prove expensive to detect and repair. This system would overcome significant draw backs of wired interfaces, i.e. there would be no interruption of operation owing to physical damage and wireless Bluetooth Technology would enable easier access to the device where physical wires and connections may be difficult to install.

II. MONITORING SECTION

A. Objective of the Proposed System

- To monitor the various Motor parameters to ensure the better performance of the motor
- To reduce the cost on wireless technology
- To know the status of the motor through user-friendly Android by wireless Bluetooth Technology

B. Block Diagram

This section describes the monitoring section of the induction motor. The whole system consists of sensors, Bluetooth module, and Arduino which are used to acquire the parameters such as voltage, current, temperature, and speed of induction motor located at the distant location. Acquired parameters are then sent to android mobile through Arduino and Bluetooth.

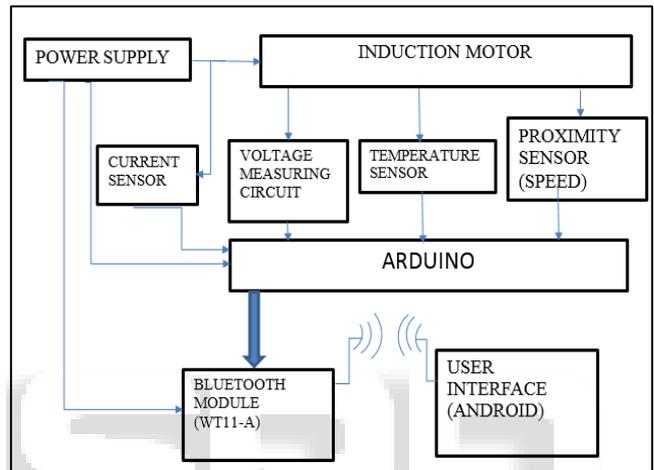


Fig. 1: Proposed Block Diagram

III. CIRCUIT DIAGRAM

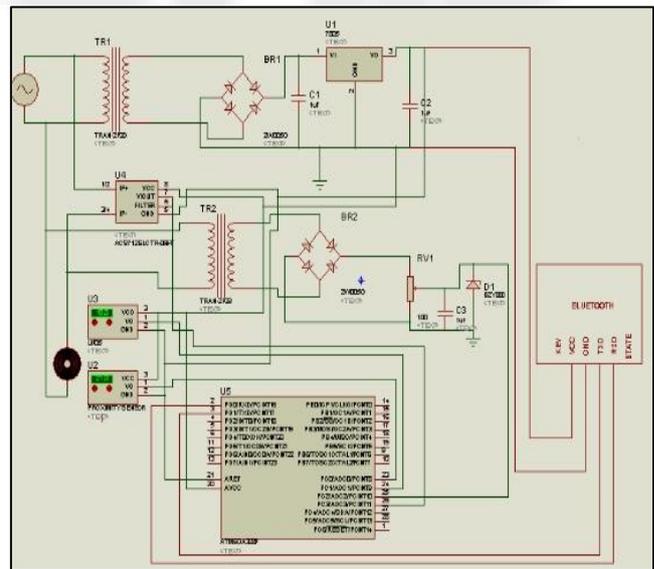


Fig. 2: Circuit Diagram of Hardware Implementation

The general circuit diagram of the proposed system shown in figure 2, this circuit diagram contains the induction motor, power supply unit, the voltage measuring circuit, the current sensor, proximity sensor, temperature sensor, Arduino, and Bluetooth module. The main objective of this circuit is to measure the various parameters like voltage, current, speed, and temperature of the single phase induction motor. All the

measured parameters are given to the Arduino as shown in figure 2, then the output produced by the Arduino is transmitted to the android (user interface) through Bluetooth module.

IV. HARDWARE IMPLEMENTATION AND WORKING

Figure 3 shows the hardware implementation of this design project. This project is to monitor the various parameters of the induction motor by using Bluetooth technology. Here the parameters like voltage, current, speed, and temperature of single-phase induction motor are monitored. First of all the supply voltage is step down to 12V by step down transformer then this 12V is given to the power supply unit then this 12V is regulated to 5V and this 5V supply is given to all the sensor units to measure the motor parameters the measured values are displayed on the Android mobile through the Arduino and Bluetooth.

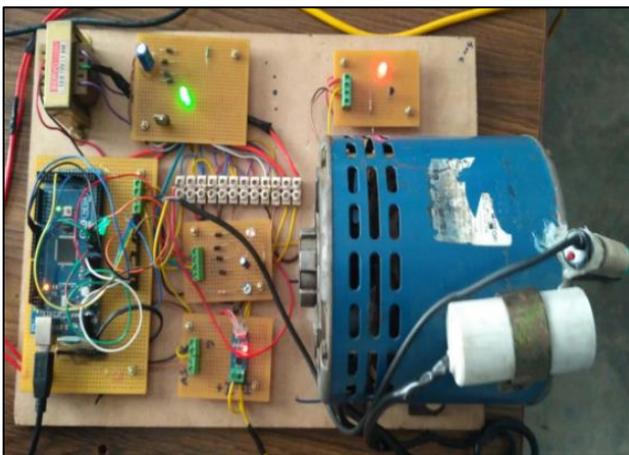


Fig. 3: Hardware Implementation of Monitoring Units of Induction Motor Parameters

V. RESULT

Figure 4 shows the output of the proposed system, here the values of voltage, current, speed and temperature of the Induction motor is obtained.

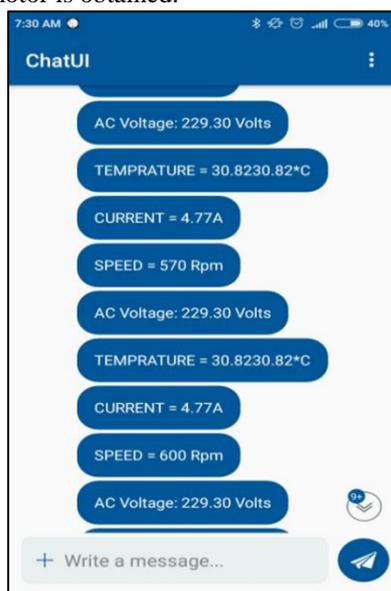


Fig. 4: Output

VI. CONCLUSION

This system is used to measure the motor parameters, and provides the information about the various parameters of the single phase induction motors. The parameters are continuously measured by the various sensors and displayed in the android by using the Bluetooth technology. This system provides the values of temperature, speed, voltage, and current. Because of this system, we protect the motor when up normal condition occurs. This system is less cost, portable and provides ease of operation.

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