

Speed control of induction motor using android application

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ABSTRACT

This project basically control the speed of induction motor wirelessly. Now days about 70% of load in industries are induction motor, they for production purpose industries required variable speed drive.

Now Days android operating system is widely used in smart phone and tablet, here we are using android application system for interfacing with microcontroller for wireless operation.

Bluetooth is used to send the data for controlling action of motor, operator can control the motor from wide range about 50m.

By using this method of control losses are very less which increases the efficiency of motor, further which reduces the cost of energy as well as increases the overall performance of speed control drive.

Keyword: - Android Application, Bluetooth Technology, and Wireless Operation, etc.

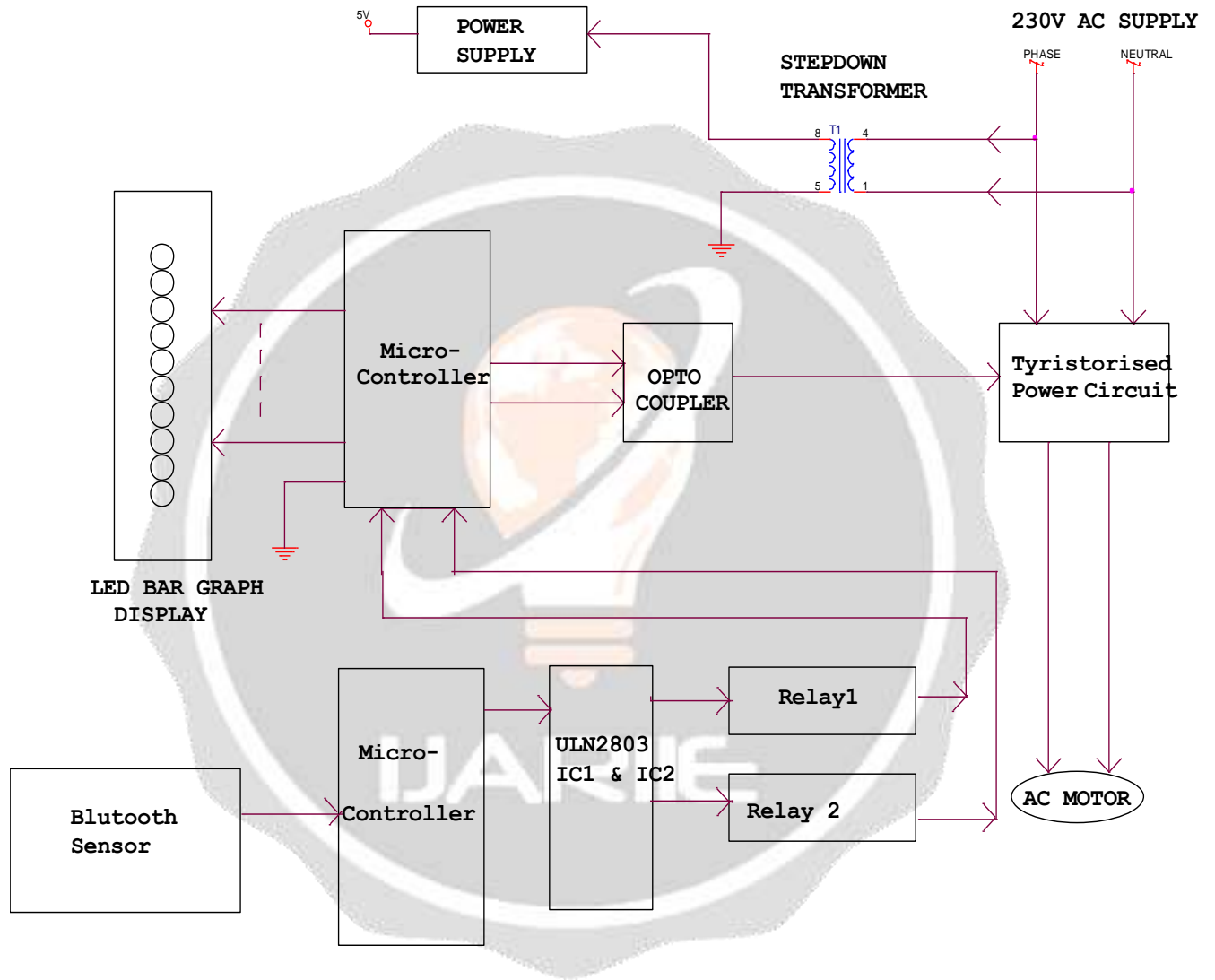
1. Introduction

For the improvement of quality product many industrial application require adjustable speed and sometimes constant speed. Due to large automation and process control the field of adjustable speed drive continuously. In the recent technology there are various technique are available for control of speed. Some methods are wireless and some of them wired. Here we are using android wireless system for control of induction motor. Android application used here act as a transmitter like remote control and Bluetooth sensor act as a receiver. Operator gives control instruction from his mobile phone or tablet to control the speed of induction motor. This type of control drives are widely used in rolling mills, paper mills, textile mills, chemical plant, etc.

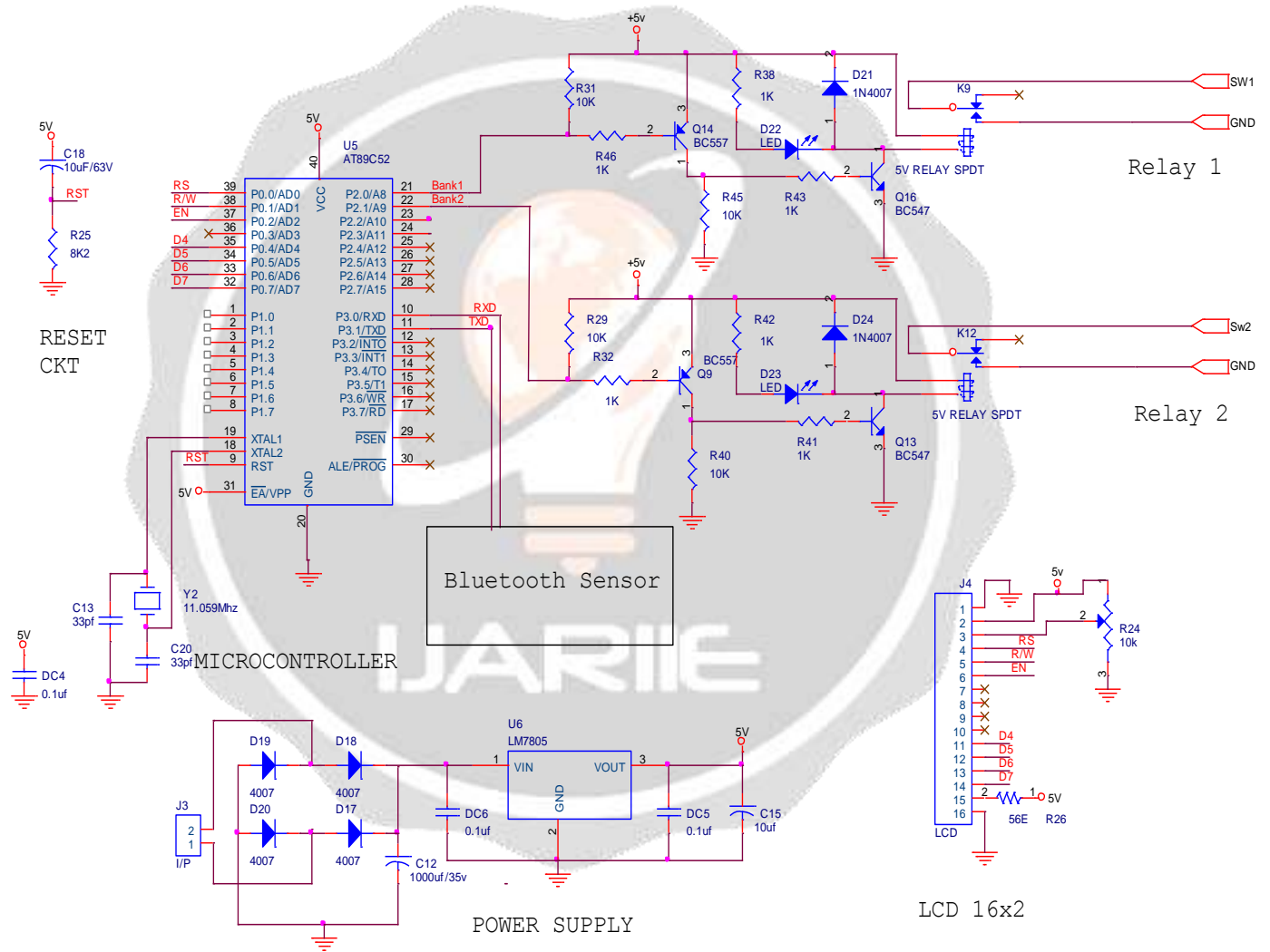
2. Problem definition

The conventional method of speed control of induction motor are stator resistance starter, rotor resistance starter, star delta starter, etc. In these conventional methods the losses are more, required large space and also wireless operation is not possible. This all problems are recover in this method of speed control. This method gives higher efficiency, less losses and also required less space.

3. Block diagram



4. Circuit diagram



5. Operation

When we give ac supply 230v, 50 HZ to the transformer it will convert 230volt supply into 9 volt, that means it act as a step down transformer. This 9 volt ac supply is then gives to voltage full wave bridge rectifier in order to convert it into 9volt dc supply. Then this supply is filtered out by using filter capacitor to reduce harmonics and ripple content in dc supply. Output of filter capacitor is maintained at 5v using regulator IC, A voltage regulator is design to automatically maintained a constant voltage level. This 5volt supply is use for the operation of microcontrollers, relay circuit, display, led, etc.

In this we use two microcontrollers one for wireless control operation of induction motor and another one is used for manually controlled. We gives control instruction to the optocoupler gives firing pulse to the thyrister power circuit. Thyrister control the current of motor so that speed control is done. There are total eight step of speed control in this way speed control of induction motor is done wirelessly as well as manually.

6. ADVANTAGES

1. Remote operation is achieved by any smart-phone /tablet etc. With android OS.
2. Technically expert controller is not required.
3. Android app is an open source system to develop any programming code.
4. Programming code is not always required to change for different input parameters.
5. Bluetooth consumes less power so more preferable.
6. More useful for the patient and disabled person.

7. APPLICATION

1. In home automation application, convinced of remotely controlling the speed of fan is achieved.
2. Many industrial applications require adjustable speed and constant speed for improvement of quality product.
3. Intensity of light can also be controlled with the help of android application.
4. Bell drive application like small conveyors, large blowers, pumps as well as many direct drive or geared application.
5. wood working machinery air compressors, high processors, water pumps, vacuum pump and high torque application.

8. FUTURE SCOPE

1. The future scope will be controlling the speed of three phase induction motor likewise that of the single phase induction motor using android application.
2. Also we can use GSM module instead of Bluetooth technology to control the speed of induction motor.
3. The speed can also be controlled automatically using temperature sensor LM 35.

9. Conclusion

The objective of a project has been achieved which has been developing the hardware and software for controlling speed of induction motor using android application. The demand for wireless operating device increases, it is more preferable over wired devices. Here we are controlling speed of induction motor using Bluetooth and android application wirelessly.

10. REFERENCES

- [1]. Rakesh Parekh (2003). AC Induction Motor Fundamentals. Microchip Technology Inc.
- [2]. Muhammad H. Rashid: "Power Electronics Circuits, Devices & Application" PHI, New Delhi, 2001.
- [3]. Salivahanan, S.Suresh, N., and Vallavaraj, A. "Electronic Devices and Circuit", Fourth Edition, Tada Seventh Edition, 2000, McGraw-Hill Publishing Company Limited.
- [4]. Zero Crossing Detectors by SUNPLUS.
- [5]. Stephen L. Herman, electricMotor Control, 9th edition.
- [6]. Agilent Technologies Introduces Industry's Fastest Optocouplers. Business Wire. December 2, 2002.

