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Speed Control of Induction Motor Using Android

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Abstract: The main intention of this project is to develop an induction motor speed control system which is helpful to control the speed of an induction motor using TRIAC. In this project, the zero-crossing point of the voltage waveform is detected by a comparator whose output is then fed to the microcontroller. And microcontroller also interfaced to Bluetooth it takes signal from the android app. As signal come from android app the speed of induction motor will decreases or increases Then, it provides the required delayed triggering pulses to a pair of SCRs through an opto-isolator connected to this circuit. Finally, power is applied to the load through the SCRs. 2 push-button switches are interfaced to the controller for increasing and decreasing the AC power to the load. In this project, a lamp is used in the place of induction motor demonstration purposes. The motor speed variation depends on the power reduction. This project in future can be enhanced by using 2 such units in any 3-phase supply for 3phase induction motor. "Android" the world's most popular mobile platform which is tool for creating application that look great and take advantage of hardware capabilities. The advantage of android is that it is an open source operating system is used in terms of mobile application that is smart phone which will act as a remote controller. Here the proposed system is designed to controlling the speed of induction motor using android application where the remotely controlling speed of induction motor is achieved. Android mobile act as a transmitter and the received by Bluetooth receiver interfaced to AVR microcontroller of 8051 family. AVR is an advanced version of 8051 microcontroller. Each time data is sent by android application as per code written is executed by AVR to deliver supply signal to triac through optical isolation. Hence the power to load connected in series with triac is controlled based on received signal and speed control of induction motor is achieved

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I.INTRODUCTION:

For the improvement of quality product many industrial application requires adjustable speed and constant speed. Due to rapid advance in automation and process control the field of adjustable speed drives continuously. In recent technology, various alternate techniques are available for the selection of speed of drive system. Up to the 1980"s the dc motor was the choice for variable speed drive application. Induction motors are using any application such as Industrial drives control, automotive control, etc. In past few years there has been a great demand in industry for adjustable speed drives. Fan, pump, Compressors, domestic applications and paper machines etc... In this area DC motor was very popular but having many disadvantages so that microcontroller transformed research and development toward control of ac drive [1]. When the three phase supply is not available for domestic and commercial application, there we are using single phase induction motor which is one of the most widely used type of low power motor in the world An induction or asynchronous motor is a type of AC motor where power is supplied to the rotor by means of electromagnetic induction, rather than by slip rings and commutator as in slip-ring AC motors. It has a squirrel cage rotor identical to a single phase and 3-phase motor winding on the stator. There are various methods for controlling the speed of AC motors [1]. There are several of method is available for speed control of ac motor one of the method is two vary frequency and voltage of motor. Speed modulation of a single-phase motor is usually achieved either by some electrical means, such as reducing supply voltage by autotransformer, or by switching windings to change the number of motor poles for different operating condition as required. For changing the speed of capacitor run motor as shown in fig.1 voltage control is best method, but it allows only limited speed range to be obtained. Now frequency acts as interesting alternative to voltage control. The most appropriator actuators for variable speed drive is seem to be capacitor run drive. In our project the speed of induction motor, control with the help of android apps that comes under wireless technology. Android application use here as a transmitter and remote control in order control the speed of induction motor with the help of Bluetooth as a receiver.

II.LITERATURE SURVEY

Literature review. Ijsrd international journal for scientific research development vol. 2, issue 08 speed control technique for induction motor.

Induction motor with fuzzy controller a review. Siva ganesh malla and jagan mohana rao malla 1 international journal of emerging trends in electrical. Automatic muimode smart charger with power supply control to. Speed control of dc motor. international journal on recent and innovation trends in computing and communication issn 2321 8169. Control of three phase induction motor. international journal on recent and innovation trends in computing and communication issn 2321 8169.

8. 8 chapter 2 literature review. Literature review paper on doubly fed induction generator wind turbine technology pdf download available . Speed control technique for induction motor a review. If instead, bridge converters are utilized, 4. a survey. This frequency is regularly 2. a survey. Design of xnor gate using set based linear threshold gate. Plc application for speed control of induction motors through vfd. equivalent electric model of the junction recombination velocity. Parametric study on the model of linear antenna arrays for cosecant. Control of three phase motor 27. 4. 4 abstract induction motors. Speed single phase induction motor using vector control 8. Literature review on variable frequency drive for induction motor. ch 4 ac. Plc and fuzzy logic

control of a variable frequency drive.Of electrical engineering, gecj 2. Simulation of speed control of single phase induction motor is carried out in two different control techniques are shown below. 7270817 ac motor speed control. Ch 10 aernators and inverters. Power quality disturbance effects in relation to 60. Weg induction motors fed by pwm frequency converters technical guide 028 technical article English. Multilevel inverter a literature survey on.

The chopper circuit is feed by a sinusoidal supply directly from the mains at 50 hz, without a preliminary ac dc conversion. the main working principle of. Remote induction motor control by android application with 7 segment display kit.ac speed control motor in a block diagram. figure 9. Here these switches will control the input voltage to the motor, which in turn controls the speed of the motor. the resuant waveform of speed is as shown. Modeling and simulation of sine pwm vsi fed induction motor drives. Ieee paper template in a4 v1 . Monitoring and control of a variable frequency drive.

Novel 5 level cascaded h bridge muilevel inverter topology abhishekthakur , rejoroy , t.v.dixit. Induction motor modeling and applications dept of electrical and electronics 1 chapter 1 1. Robust speed control of a doubly fed induction motor using state space nonlinear approach leonardo j sci 2013, 22, 103 120.

Remote induction motor control by android application with 7 segment display. Power loss reduction through single phase induction motor. Vehicle speed control system using rf communication. Speed sensing and loading system. the entire hardware setup is as shown in above fig 6. it consists of an ac chopper, control unit, induction motor and. Literature review on variable frequency drive for induction motor. tyler perry presents house of payne.

Document. 1_4_2. document. electronic control of ac motor. Vos voage o set. xii 13. chapter 1 introduction and literature review. Speed control of dc motor using pwm.

Fig. 24 block diagram of closed loop control. Figure 2. fig. 2 construction of induction motor. Spg offers a various speed control solution by closed loop voage control technology clvc for a single phase ac motors 6w 180w along with adjustable. Induction motor braking. document. induction motor control. Figure 1. fig. 1 classification of speed control motors. Speed control of brushless dc motor using plc.

Z source inverter simulation and harmonic study. Documents similar to literature review dc motor. A digital phase locked loop speed control of three phase induction motor drive performances analysis. Similar to speed control of induction motor. For the set speed of 550 rpm, the chopped output voage of the ac chopper which is given to the motor at loaded condition is shown in figure 10.

Robustness of the controller again due to the fact that the speed reaches the reference value above the complex gain is designed for induction motor. Voltage and current harmonic variations in three. By this method speed control of single phase induction motor is controlled by v/f method effectively. The system unit converts the measured current and. Block representation of the circuit. Induction motor drives. document. For the same circuit a load has been applied in steps and resus has been tabulated which is given in table 1. from resus we can conclude that in hpwm. Single phase induction motor speed control. Electronic control of ac motor. Vi. conclusion. generally for the speed control of induction motor.

III.RESEARCH EMTHODOLOGY

As shown in above figure transformer T1 step downs 230 V AC into 9 V AC and this given to bridge rectifier. This rectified output is directly fed to base of Q1 through resistors R2. Same rectified output is filtered through C1 and given to regulator IC 7805. Output of 780 is regulated 5 VDC that is given as biasing voltage for both transistors Q1 & Q2 (same regulated 5 V supply is given to main control section also). Both transistors are connected in switch configuration. The final output C‟‟ is given to main control section.

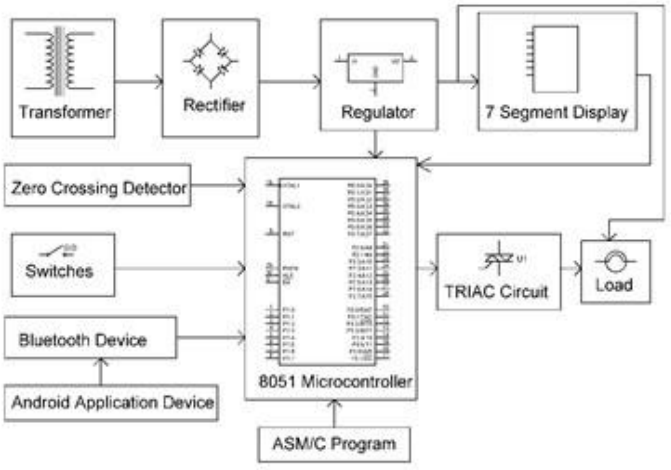

Figure 1: Research methodology of proposed system

Transformer:

Steps down the AC mains voltage (230V) to a lower AC voltage (e.g., 12V AC).

Rectifier:

Converts the AC voltage into pulsating DC voltage using diodes (bridge rectifier).

Regulator:

Smooth's and regulates the DC voltage to a constant level (typically 5V DC) suitable for microcontroller and other components.

7 Segment Display:

Displays the load status or other output (e.g., load number, power level).

Zero Crossing Detectors:

Detects the point where the AC waveform crosses zero voltage. This is crucial for accurate phase control of the load using the

TRIAC.

Switches:

Manual control interface (can be used to switch loads ON/OFF).

Bluetooth Device:

Enables wireless communication with the microcontroller.

Android Application Device:

Sends control commands via Bluetooth to the microcontroller (e.g., ON/OFF, timer, dimming).

TRIAC Circuit:

Acts as an electronic switch for controlling AC loads. It is triggered by the microcontroller at the zero-crossing point for smooth operation.

Load:

Electrical device (e.g., bulb, fan) connected and controlled via the TRIAC.

IV.CONCLSUION

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

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