

Implementation of Remote Lab for Motor Control and Load Characteristics

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Abstract: *This project is intended to develop an application for a tablet as a replacement to the conventional method of verifying the characteristics of a single phase induction motor and reduce the cost and increase the accuracy in the practicals. The Android mobile operating system is constantly attaining more interest of developers throughout the globe. In this project we aim to further understand the Android platform and create a fast and powerful open source Tablet application. An application that requires rapid data acquisition, AT89S52 microcontroller, Bluetooth module and an Android application. Designing and building our own analogue to digital front-end we further develop our knowledge of the Bluetooth interface. The application is developed using Android which is a operating system, an open source for creating the desired application which can be modified whenever wished to change. This makes use of the Android sdk tools.*

1. INTRODUCTION

Conventionally electrical experiments are performed and verified by the concerned person based on the obtained results and observed graphs. Hence experimental environment plays a major role in judging the output characteristics. Manually Ideal implementation of experiment is not possible and thus it may lead to errors. For performing the same experiment by different people the operational environment changes because of manual errors or instrumental errors so it will be a struggled task for them to check the results. Hence predefined experimental environment is recommended.

Generally in educational institutions where students need to perform experiments in a group and results need to be noted separately by them, hence congestion occurs for a faculty to check whether the concerned student done the experiment or not. Hence in order to overcome the above issues a remote lab should be implemented such that it has pre defined experimental environment and which can dealt with ideal and desired load characteristics.

This project display the load characteristics graph by an application developed using Android OS. This project helps to reduce the tedious and the tiresome work of verifying the results manually of the individual who performed experiment This helps the concerned faculty to verify the output results of the experiment done by the student directly by seeing the graph. This deals with development of an Android application, i.e. the application source code is written in the XML file and is run in the eclipse IDE which is a platform that runs the android applications

As we all know that the present day electrical labs are at their best to make us feel a good visualization effect. Whereas they are failing to achieve desired voltage and current ranges. Being an engineer, every one aspires to know that for fulfilling that dream we are going towards an android application that allows us to know the voltage and current values and their corresponding characteristics graphs with the minimum effort. Besides this project is economical .Besides this project has a serious impact in influencing the society in terms of knowing the setting up of an ideal experimental environment by which desired voltage and current values can be obtained.

2. LITERATURE SURVEY

The base of our project starts from the idea of UTS remote laboratory. It uses real, *physical* equipment that has been instrumented with cameras and connected to the internet. The experiments vibrate, move around and make noise, exposing students to a real-world learning experience in their own time and as often as they want. Since its first creation in 2001, the variety of experiments available in the UTS Remote Laboratories has grown considerably, now covering more than 40 individual experiments in industrial, civil, computer, electronic and mechanical engineering, as well as science. In recent years, UTS has also offered access to over 2,000 students from other universities and high schools across Australia, some living in remote locations. This provides more students with the opportunity to access a wider range of experiments which may not be available locally. It also allows universities to save on laboratory expenditure while sharing expensive or highly specialized equipment online.

3. DESCRIPTION

The main aim of this project is to develop an application to display the load characteristics of three phase induction motor in the form of a graph in Tablet. Through this app the experimental analyzer can analyze the experiment of the doer without his actual presence next to the doer.

The project is divided into three main parts.

- 1) Performing the experiment on Induction motor for the exact load characteristics.
- 2) Uploading those values to the AT89S52 controller
- 3) Displaying the values in the form of a graph on the Tablet.

The first step involved here is conducting the experiment on the machine and obtaining the exact values of load characteristics, then dumping of these values into the AT89S52 controller through Embedded c software. The main important consideration here lies with the interfacing of the hardware components. So a proper care must be taken while doing so.

4. BLOCK DIAGRAM

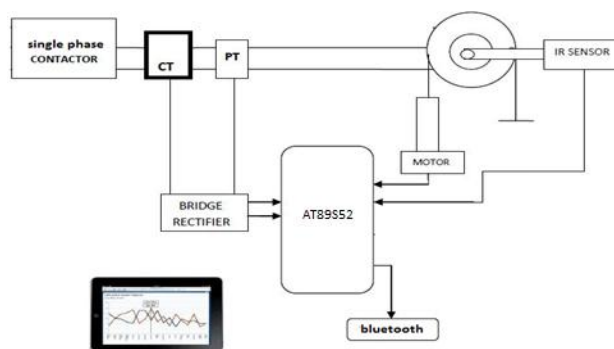


Fig 1. Block Diagram

The AT89S52 is a low-power, high-performance CMOS 8-bit micro controller with 8Kbytes of in-system programmable Flash memory. The device is manufactured Using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 micro controller. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable flash one monolithic chip; the Atmel AT89S52 is a powerful micro controller, which provides a highly flexible and cost-effective solution to many embedded control applications.

5. TESTING AND DEBUGGING

In this project induction motor parameters are send to a device through wireless communication. IR pairs are used to find the rpm of an induction motor. Current sensor/potential sensor are used to find the current value and voltage values consumed by an induction motor. After obtaining the values this information is send to a mobile device using a wireless communication device Bluetooth.

By using this wireless communication we reduce the need of a person who wants to monitor the parameters of a motor is no need to always at equipment

6. CONCLUSION

By using this system we have constructed an embedded remote which monitors induction motor parameters and send the information to mobile using Bluetooth technology. This system is not difficult to introduce and install and does not require extra wiring. The system is exceptionally advantageous and can be utilized by simply connecting it to motor.

REFERENCES

- [1]. bahramamin, "induction motor analysis and torque control".
- [2]. www.engineeringtoolbox.com
- [3]. hongfengwang, "overview of bluetooth technology".