

INTERNET-BASED REMOTE LABORATORY

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**In the Name of Allah
Most Gracious Most Merciful**

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ABSTRACT

This thesis describes the software development for Internet-Based Remote Laboratory. Current technology enables the remote access and control of laboratory equipment and instrument for real-time via Internet. This can be especially useful in engineering education; part time student and remote student can conduct laboratory experiment remotely. Such remote laboratory experiment method can also enable student to use expensive laboratory experiment, which is not usually available to students. This thesis also present a general method of creating a web-based Remote Laboratory experimentation, which enables Electrical Engineering students to control the real instrument through Internet and conduct oscilloscope experimentation remotely. The philosophy behind this remote laboratory is based on a client/server configuration.

TABLE OF CONTENTS

CHAPTER DESCRIPTION	PAGE
1.0 INTRODUCTION	1
1.1 Introduction	1
1.2 Scope of the thesis	2
1.3 Organization of the Thesis	3
2.0 INTERNET	6
2.1 Introduction	6
2.2 Independent Internet	7
2.3 Element Of Internet	8
2.4 The Components of LAN	9
2.5 Gateways	12
2.6 Router	13
3.0 NETWORK INSTRUMENTATION	15
3.1 Introduction	15
3.2 HP-54600A Digital Oscilloscope	15
3.3 Functional Overview of HP-54600A Digital Oscilloscope	17
3.4 General purpose Interface Bus (GPIB) Controller	18
3.5 Features of the ALG-232 GPIB Controller	18
3.6 Communication on the GPIB	19

CHAPTER 1

INTRODUCTION

1.1 Introduction

Distance education is being introduced at the university level because it improves flexibility in university education. Remote labs are actual laboratory experiments that are run remotely via a web interface [1]. This type of lab is well suited to distance learning courses where students need not be physically on campus. Parameters can be set on the web, then, a software interface converts those parameters to a form that is accepted by the local computer running the experiment.

This way has been proven that the Internet will be a reliable communication source for data transmission, which allows control of process and become an important interfacing to enhance learning process and expand educational opportunities for students [2]. The Remote Laboratory represents an extension to the ways in which people utilize the Internet.

A remote laboratory for engineering education should realize an integrated environment for user controlling the real device in the remote site and conducting the actual experiments in the remote laboratory through a computer network. The core of the Remote Laboratory is a cluster of general-purpose and/or specialized instruments interfaced to a set of personal computer systems connected to the Internet. With the ability to configure instruments and data analysis remotely via