REAL TIME INTERNET INSTRUMENTATION

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TAJUK PROJEK : REAL-TIME INSTRUMENTATION USING THE INTERNET

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"SELAMAT MENJALANKAN PENYELIDIKAN"

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ABSTRACT

This research project describes the software development of remote access and control for real-time measurement via the Internet. The philosophy behind this remote laboratory is based on a client/server computer configuration. The client is a computer equipped with user interface functions, which gives users the ability to act on the remote experiment. On the other hand, the server is the computer located near the real process and equipped with the hardware interface to the experiment. The server software receives the client commands and transmits them to the real process. The advancement of Internet technology enables them to communicate, transferring both data and command at real time. A simple test circuit was designed for the purpose of measurement. Microsoft Visual Basic was then used to develop the graphical user interface (GUI). This GUI enables users to manipulate the data received according to their needs.

1.0 INTRODUCTION

Networking has become the standard method in connecting Personal Computers (PCs) to enable the sharing of resources and information transmission. In 1987, around a tenth of all PCs were connected to a network. In 1992, over a half of all PCs were attached to Local Area Networks (LANs) [1]. A LAN is a communication system used to interconnect all computers in an organisation generally within a single building, or single site. For long distance communication within an organisation, or between organisations, Wide Area Networks (WANs) are employed using either the public network or private rented lines. Today, the entire world is inter-networked into what we have come to know as the Internet.

Although most networked applications are focused on office environment for file transfers and other data communications between computers, it can be extended to cover real-time operations involving laboratory instrumentation and for industrial monitoring and control.

Laboratory control of instruments using the LAN have been successfully implemented in an earlier research using the HP54600 oscilloscope attached to a General Purpose Interface Board (GPIB) controller and a PC [2]. However, the control and data acquisition is localized to a particular LAN zone. In this project, the scope of work is extended by placing the control PC remotely from the instrument and connected to the instrument via a WAN/Internet.

The scope of this research was categorized into four steps. The first step is adopting a general purpose Internet instrumentation driver software. This software provides a highly educational tool for instrument control using the power of networks. The system is based on Microsoft Windows 95/98/NT and the TCP/IP protocol. This requires a Windows 95/98/NT machine configured as a server and a number of Windows 95/98 PCs linked as clients in a client-server configuration. This