POWER ELECTRONICS AND BASIC ELECTRONICS REAL EXPERIMENTS THROUGH THE WORLD WIDE WEB

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Abstract *— The increasing diffusion and development of the information and communication technologies has allowed the introduction of new techniques, such as the virtual laboratories, in the world of research and education. The main feature of these laboratories is the remote control of the applications that are developed in the local laboratory and the remote data acquisition and treatment that can be carried out from any point of the planet. This paper focuses on the new equipment, based on specific software and hardware, dedicated to the Power Electronics and Basic Electronics teaching through remote HTTP network access. Besides, a novel methodology based on real-time data transfer and interactive applications is presented here. This methodology has been developed on a set of Virtual Instruments designed over LabView®.*

Index Terms — Internet, Interface, Virtual Instrument, real-time control, Telelaboratory, Power electronic, remote experimentation, Basic Electronic.

INTRODUCTION

On the one hand, the current evolution of test and measurement systems is leading us to the use of the personal computer as the main element of these systems. Concretely, PC based instrumentation is emerging very fast due to the development of Virtual Instruments (VI) in both research and educational laboratories. These VI exploit the computer open-standards architecture in order to provide the data-processing, memory and visualisation capacities of the computers. On the other hand, the recent exponential development of the Internet is opening the way to reach a new environment for the use of computers in the industrial and educational world. Many features on research, publications and data acquisition can be obtained through Internet [1]. In order to do that, a laboratory that allows the access to real equipment, data analysis and real-time remote measurements will be developed [2].

GENERAL STRUCTURE

The general structure of a specific application on Power Electronics and Basic Electronics is described below. We will offer the access to a real-time process under study to a remote student. The access will be through the Internet and will allow the remote user to control the process, analyse the results and manipulate the real-time data from his computer simply by operating a switch. The only requirement for the client computer is to incorporate any web browser. In order to reach this objective the following interfaces are necessary:

- **User/process Interface**, based on the previously designed VIs [3]. The main VIs that have been developed in order to observe, to control and to study the real-time process are *Function generator and Oscilloscope*. The two of them offered the possibility of storage and recovering generation and adquisitions patterns.
- **Process/computer Interface**, based on a data acquisition card. The DAQ-Board is necessary in order to sample the signals under study, to generate the process input and to control other available options of the real-time process under study.

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