

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

NICOSIA-CYPRUS

DATA ACQUISITION SYSTEM USING

A PERSONAL COMPUTER

EVAGORAS XYDAS

M / 837

JUNE 1998

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A PERSONAL COMPUTER**

**BY**

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HIGHER TECHNICAL INSTITUTE	PROJECT NO.  2923
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**Higher Technical Institute**

**Nicosia-Cyprus**

**Mechanical Engineering Department**

**Diploma Project 1997/98**

**Project Number : M/837**

**Title : Data Acquisition System Using a Personal Computer**

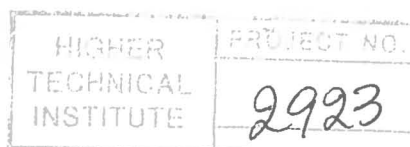
**Objective :** To assemble a PC based system capable of measuring a number of channels.

**Terms and Conditions:**

1. The project is to use a custom made application program while the hardware is to be provided.
2. After the successful completion of the program a run on a real life application (HTI experiment) is to be made.
3. The student may work on his own computer if he owns one.

**Student :** Evagoras Xydas

**Supervisor :** P. Eleftheriou



## Acknowledgements

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## Introduction

PC-based data acquisition (DAQ) systems and plug-in boards are used in a very wide range of applications in the laboratory, in the engineering field, and on the manufacturing area. Typically, DAQ plug-in boards are general-purpose data acquisition instruments that are well suited for measuring voltage signals, that could be the output of a transducer converting temperature, pressure, radiation or any other measurable value.

However, many real-world sensors and transducers output signals must be conditioned before a DAQ board or device can effectively and accurately acquire the signal. This front-end preprocessing, which is generally referred to as signal conditioning, includes functions such as signal amplification, filtering, electrical isolation, and multiplexing.

In addition, many transducers require excitation currents or voltages, linearization, or high amplification for proper and accurate operation. Therefore, most PC-based DAQ systems include some form of signal conditioning in addition to the plug-in DAQ board and personal computer.

The advantages of applying a data acquisition apparatus onto a procedure (e.g. a laboratory experiment) are several. Speed, elimination of human error, extremely powerful data management (graphs, functions etc) and easy data exchange between data processing programs such as lotus, excel, cad programs and an extremely large number of other relative software.

The purpose of this project, diploma work, is to study the operation principles, the use and the setup of a data acquisition apparatus in general, to present several existing applications, and finally the assembly and programming of an apparatus consisting of a das8 series analogue to digital converter, an exp15 or an exp16 series signal conditioning and expansion device, a personal computer and all necessary compartments and accessories, for data abstraction concerning distribution of temperature. Future improvements and extensions of this application will be also discussed. Note that, this book covers only subjects and

applications that concern engineering, but know that, DAQ is applicable to many other fields such chemistry, statistics, meteorology and many others.