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DIPLOMA PROJECT

# DATA ACQUISITION AND CONTROL SYSTEM FOR GREENHOUSES

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# DATA ACQUISITION AND CONTROL SYSTEM FOR GREENHOUSES

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# INTRODUCTION

The purpose of Data Acquisition Systems (DAS) is to collect data from the outside world and store it ready for processing. Its input is a traducer that incorporates a sensor and the data is normally stored in a computer (PC). The computer is also the controller in the system.

The field of Data Acquisition can not be considered as a traditional field of technology like heating, fluid mechanics, strength of materials or electronics, due to its short history. It was first added in science terminology not more than two decades ago. At the beginning it was more or less an "alien" and very few people were actually dealing with Data Acquisition, thus it was not considered an accessible field for everyone.

During the latest years, the field has rapidly enhanced. The technology has been improved in such a rate that it reached the levels of fields with much longer history. Like what happened to personal computers, Data Acquisition systems were at first too expensive and not quite powerful, but ended cheap as to be affordable for the majority and powerful enough so that to satisfy even the most complicated requirement.

The simultaneous increase in power and decrease in cost expanded the horizons, adding more fields of applications. At the beginning, only in extreme applications Data Acquisition was applied due to high cost. Today Data Acquisition is applicable in a wide range of fields, starting from simple and low budget systems up to very sophisticated systems for complicated applications. The major fields where Data Acquisition are introduced include control systems, research projects, product testing & quality control, process monitoring etc.

A single data acquisition system can be built around a single PCB card, which is inserted into a PC and in this case the card is called DAS-8/PGA. This card is a data acquisition card that has eight analog input channels, which can collect any physical quantity, such as temperature, humidity, length etc, and convert it into an electrical signal. This signal, with the use of the appropriate formulas, will be converted to a number, which will correspond the value of the physical quantity measured. This card can also be used with an EXP-16 card, which is a sub-multiplexer. A sub-multiplexer takes one analog input channel of the DAS-8/PGA board and it expands it into 16 different analog input channels. This helps to get more measurements with one channel.

In this project, the above two cards will be used to assemble a PC based circuit from which the data needed (in this case temperature) will be collected. This data with the use of a program which will be written in GWBASIC, will help to calculate the Relative Humidity and be able to control an air heater, an exhaust fan and two air re-circulators for further use in a Green House Control System.