HECHER TECHNECAL INSTITUTE

ELECTRICAL ENGENEERING DEPARTMENT

DIPLOMA PROJECT

GENERATING SIGNALS USING A PC

E.1116

ANTONIS ANTONIOU

NUME 1998

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

GENERATING SIGNALS USING A PC

E.1116

ANTONIS ANTONIOU

JUNE 1998



CONTENTS

ACKNOWLEDMENT

INTRODUCTION

CHAPTER 1. INTERFACING PRINCIPLES

1.0	GENERALLY ABOUT	1
	COMPUTRES	
1.1	DATA ACQUISITION	1
	SYSTEMS	
1.2	GEREATION OF INPUT AND	3
	OUTPUT PORT FROM THE	
	PC SYSTEM BUS	
1.2.1	PC SYSTEM BUSSES –ISA	3
1.2.1.1	THE DATA BUS LINES	4
	D0 TO D7	
1.2.1.2	THE ADDRESS BUS	4
	LINES A0 TO A9	
1.2.1.3	CONTROL LINES	5
1.3	INTERFACE PRINCIPLES	5
	CIRCUIT	
1.4	INPUT OPERATION	6
	OR READ CYCLE	
1.4.1	OPERATION	7
1.5	OUTPUT OPERATION	7
	OR WRITE CYCLE	

1.6	ADC :ANALOGUE TO	9
	DIGITAL CONVERTER	
1.6.1	DESCRIPTION	9
1.6.2	OPERATION	9
1.7	DAC:DIGITAL TO	11
	ANALOGUE CONVERTER	

CHAPTER 2. BLOCK DIGRAM OF THE WHOLE PROJECT

	2.0	INTERFACE CARD	
	2.1	CIRCUIT DESCRIPTION	13
	2.1.1	THE DECODING CIRCUIT	13
	2.1.2	CIRCUIT OPERATION OF	14
		INPUT PORT	
	2.1.3	CIRCUIT OPERATION OF	14
		OUTPUT PORT	
	2.2	CIRCUIT DESIGN FOR INPUT	15
		PORT BLOCK B1	
	2.2.1	CIRCUIT DESIGN FOR	16
		OUTPUT PORT B2	
	2.3	READ AND WRITE CYCLES	16
		PROCEDURES	
	2.3.1	READ CYCLE OR INPUT	16
		CYCLE PROCEDURE	
		FOR ADC	
	2.3.2	PROCEDURE OF THE	18
		OUTPUT OR WRITE CYCLE	

CHAPTER 3. PCB's CIRCUIT DECIGN

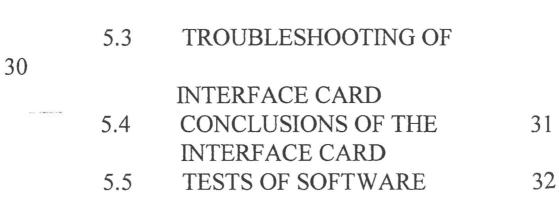
3.1	PRINTED CIRCUIT BOARDS	19
3.2	PCB DESIGN	19
3.3	PCB1 DESIGH INFORMATION	19
	FOR THE DECODING CIRCUIT	
	TOGETHER WITH AND OUTPU	T
	PORT	
3.4	PCB2 DESIGN INFORMATION	22
	FOR THE INPUT PORT	
3.5	PCB3 DESIGN OF THE CARD	24
	WHICH IS INSERTED INTO	
	THE COMPUTER ON THE ISA	
	SLOT	

CHAPTER 4. SOFTWARE CONTROL

4.0	INTRODUCTION	26
4.1	SOFTWARE STRUCTURE	26
4.2	SIGNAL GENERATION	27
	PROGRAMS	

CHAPTER 5. TROUBLESHOOTING CONCLUSIONS AND COMENTS

5.1 TESTS AND CONCLUSIONS 30



ACKNOWLEDGMENTS

I would like to thank my supervisor Mr. M. Kasinopoulos for his excellent quidance and his helpful assistance during the design and troubleshooting of this project.

I would also like to dedicate to my parents and my sister.

Finally I would like to thank the lab assistants for their help in the electronics labs.

SUMMARY

The main objectives of this project were to design an interface card in order to generate signals on the oscilloscope and to enter data into the PC.

The project is dealing with both hardware and software control The first chapter refers generally to computers and to the Data Acquisition System , with full explanation of each part of the DAS.

In the second chapter there is full explanation of the project and block diagrams showing the hardware .

The third chapter is showing the PCB's design for the needs of this project. Also there are lists of the components used and information about the PCB's.

The fourth chapter explains the implementation of the Pascal programs.

At the last chapter troubleshooting is explained step by step. This chapter also contains the comments and conclusions.

INTRODUCTION

Computers are an essential tool of modern society. They have several applications .One of the applications is to generate signals, and to read data from the outside world..

The computers have lead to a point where everything, is want to be controlled or just observed by the computer. This project is somehow a Data Acquisition System.

To generate these signals it is required to create an interface card which will consist of a Digital to analogue converter as an output port and Analogue to digital converter as an input port.

Through software those signals are outputted to the oscilloscope.

In this project there will be a demonstration of the different generated signals