HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

DEVELOPMENT OF A COMPUTER MULTIPURPOSE INTERFACE CARD

by

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DEVELOPMENT OF A COMPUTER MULTIPURPOSE INTERFACE CARD

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INTRODUCTION

This project presents hardware and software design for the development of a computer multipurpose interface card. The aim of this project is to enable the IBM PC to drive electronic devices located outside the PC or receive information from devices for data manipulation. Also a combination of this two is possible making the PC capable of reading certain information manipulating the data and driving certain output devices.

The computer is capable of understanding only digital signals 8-bit 16-bit etc. The IBM PC can understand only 8-bit signals as all the external signals are 8-bit while the processor instructions are 16-bit.

To interface to the IBM PC system bus an input output I/O card was designed and constructed providing 16 lines for I/O use. These 16 lines are divided into two 8-bit ports. Each port is controlled by software and can be used as an input or an output port. These two ports occupy a certain address in the memory of the PC. The IBM PC provides specific area for the use of a prototype card having available 32 port addresses from the address 0300H to 031FH. All the signals at the IBM PC system slot are explained.

A great number of applications can be operated with the constructed interface card. In this project a stepper motor and a digital to analoque converter were used as output devices. An analogue to digital converter and an 8-way switch were used as input devices. A number of Analogue to Digital and Digital to Analogue converting methods are explained. The characteristics and functions of each IC used are explained. Static and dynamic testing was done for all circuits. For the stepper motor and the Digital to Analogue Converter, software was developed using the Turbo Pascal to provide for the stepper motor different movements and for the Digital to Analogue Converter three different waveforms.