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DIPLOMA PROJECT
INTERFACING SENSORS TO THE IBM PC

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INTRODUCTION

This project present hardware and software design for interfacing a variety of sensors to the IBM PC. The aim of this project is to enable the IBM PC to read physical quantities. Also some output devices are attached. So the PC it analyze the information which take from the input sensors and drive accordingly the output devices.

Many sensors provide analog voltage levels. The computer can understand only digital signals, 8-bit, 16-bit, 32-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. An Analog to Digital Converter, ADC, was used to perform the change of the analog voltage to digital signal.

To interface to the IBM PC system bus an Input Output, I/O, card was design and constructed providing 24 lines for I/O use. These two 8-bits and two 4-bit ports are occupy a certain address in the memory of the PC. Each one of the four ports can be controlled by software and can be either input or output port. Also the ports can set to work in handshaking mode by software. All signals at the IBM PC system slot are explained.

Temperature, optical, displacement and other sensors were used as input sensors. The TRIAC with zero voltage switching action, the stepper motor, the DC motor, the relay and other devices were used for output purpose.

By making combinations of the input sensors and output devices different applications were achieved. 1) The control of the power of a heater in accordance to the temperature of the room and the temperature outside the room that the heater is installed. 2) The illumination of an incandescent lamp was regulated by adjusting the power of the lamp. This project can also be used as DATA acquisition system.

The software was developed in TURBO PASCAL language using ready made units and pascal objects, in Object Oriented Programming, OOP. The program is friendly user and uses the graphic mode for displaying graphs.

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