ABSTRACT

In many hardware projects there are needs for real time clock or delay program. Such devices as clocks, and timers are impossible to product without knowledge of exact time. The goal of this project is to create an interrupt function to drive the real time clock by using Microchip PIC16F877A. Features in the clock are provided to set, adjust timings. Appropriate circuit and software are developed.

The model of this PIC microcontroller based clock is constructed by three main units. They are Microchip PIC16F877A, 16x2 lines LCD panel, and 4x4 keypad. Microcontroller works as a main core unit for this project. All the output results are displayed through 16x2 LCD screen. The 4x4 keypad is let user enter number to adjust the clock time.

Due the PIC16F877A is supported in mikroC, thus the whole program is designed from this software by using C language. Library routines in mikroC gave plenty assistance in designing program code such as LCD display, initialization of keypad. The program codes in this project have been classified into few functions. They are interrupt, keypad, LCD, and the main function for clock time display.

Testing results are obtained during the experiment in breadboard circuit. Troubleshooting jobs are involved in both hardware and software. In hardware, LCD panel and keypad function has been improved by adding the pull-up resistors. In software, some debugging jobs are implemented in program code (display, time accuracy, adjust time feature). After troubleshooting and assure that the whole project can work properly, PCB circuit is carried out by using ExpressPCB.