

Experiment No: 10

AIM:- Generation of PWM signal for DC Motor control.

APPARATUS:- PIC18F4550 Development board, Adaptor, USB cable, DC Motor.

THEORY: The PWM feature allows us to create pulses with variable widths. Although, timers can be used to create PWM, the CCP modules makes the programming much easier and less tedious. PWM is widely used in industrial controls such as DC motor control. Indeed, PWM is so widely used, that Microchip has enhanced PWM capabilities as Enhanced CPP, where motor can be connected through H bridge. The CCP module uses Timer 2 and its associated registers, PR2 for the PWM time base which means that the frequency of the PWM is a fraction of the Fosc, the crystal frequency. It uses the PR2 register to set the PWM period as follows:

$$PR2 = [F_{osc} / (F_{pwm} * 4 * N)] - 1$$

Steps in Programming PWM The following steps are taken to program the PWM features of the CCP Module:

1. Set the PWM period by writing to the PR2 register
2. Set the PWM duty cycle by writing to CCP1L for the higher 8 bits
3. Set the CCP pin as an Output
4. Using the T2CON register, set the prescale value.
5. Clear the TMR2 register
6. Configure the CCP1CON register for PWM and set DC1B2:DC1B1 bits for the decimal portion of the duty cycle
7. Start Timer 2

A motor driver L293D is provided on the Micro- PIC18F board for the user. The user can connect DC motor or stepper motor to connector CN9. In order to use DC motor put switch SW26 in position 2-3, while to use stepper motor put switch26 in position 1-2.

MICROCONTROLLERS – LABORATORY MANUAL

Interfacing Details for DC Motor.

Device	Pin Details	CN9
DC Motor	RC 2	CN 9.4
Peripheral Selection		
SW 26	towards DC_ON	

Circuit Diagram:

Flowchart: