SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Sub: Microcontroller Programming And Interfacing

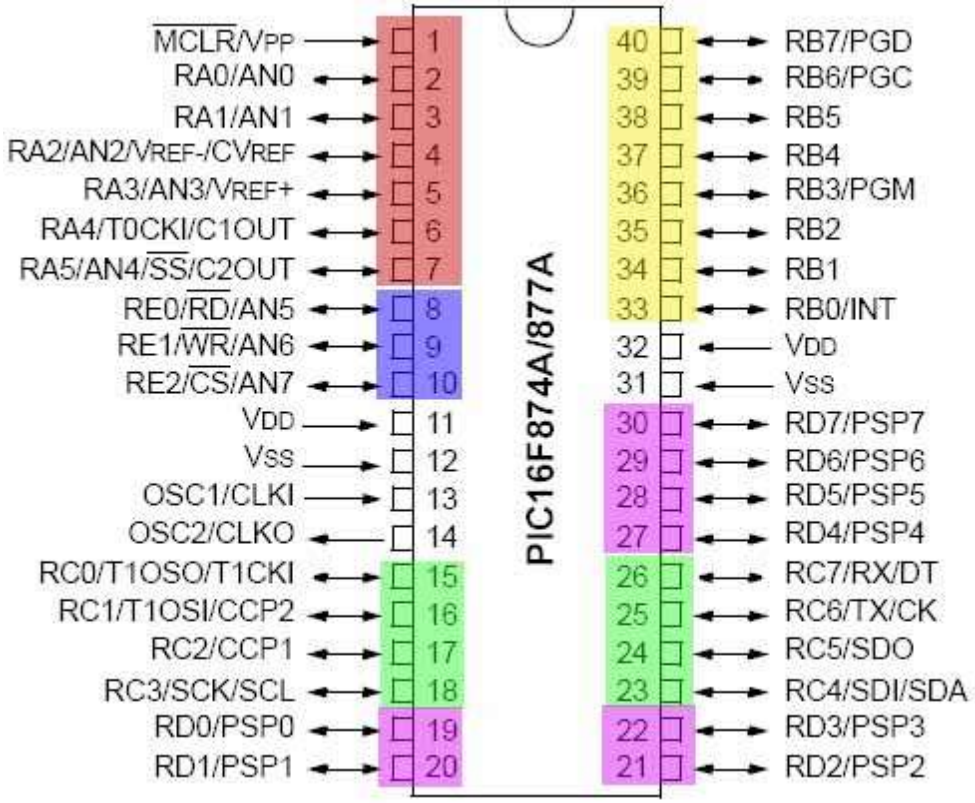
Subcode:23ECB202

Unit-I

PIC Microcontrollers: History, Features, & Architecture

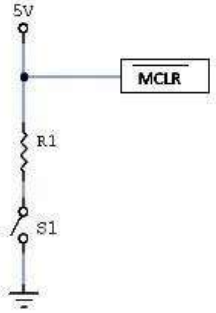
PIC16F877A Pin Diagram

PIN Diagram


PIC16F874A/877A
MCLR/VPP 1
RA0/AN0 2
RA1/AN1 3
RA2/AN2/VREF-/CVREF 4
RA3/AN3/VREF+ 5
RA4/T0CKI/C1OUT 6
RA5/AN4/SS/C2OUT 7
RE0/RD/AN5 8
RE1/WR/AN6 9
RE2/CS/AN7 10
VDD 11
VSS 12
OSC1/CLKI 13
OSC2/CLKO 14
RC0/T1OSO/T1CKI 15
RC1/T1OSI/CCP2 16
RC2/CCP1 17
RC3/SCK/SCL 18
RD0/PSP0 19
RD1/PSP1 20
40 RB7/PGD
39 RB6/PGC
38 RB5
37 RB4
36 RB3/PGM
35 RB2
34 RB1
33 RB0/INT
32 VDD
31 VSS
30 RD7/PSP7
29 RD6/PSP6
28 RD5/PSP5
27 RD4/PSP4
26 RC7/RX/DT
25 RC6/TX/CK
24 RC5/SDO
23 RC4/SDI/SDA
22 RD3/PSP3
21 RD2/PSP2

PIN Diagram

- PIN 1: MCLR: The first pin is the master clear pin of this IC. It resets the microcontroller and is active low, meaning that it should constantly be given a voltage of 5V and if 0 V are given then the controller is reset. Resetting the controller will bring it back to the first line of the program that has been burned into t



A push button and a resistor is connected to the pin. The pin is already being supplied by constant 5V. When we want to reset the IC we just have to push the button which will bring the MCLR pin to 0 potential thereby resetting the controller.

- PIN 2: RA0/AN0:PORTA consists of 6 pins, from pin 2 to pin 7, all of these are bidirectional input/output pins. Pin 2 is the first pin of this port. This pin can also be used as an analog pin AN0. It is built in analog to digital converter.

PIN Diagram

- PIN 3: RA1/AN1:This can be the analog input 1.
- PIN 4: RA2/AN2/Vref- :It can also act as the analog input2. Or negative analog reference voltage can be given to it.
- PIN 5: RA3/AN3/Vref+:It can act as the analog input 3. Or can act as the analog positive reference voltage.
- PIN 6: RA0/T0CKI:To timer0 this pin can act as the clock input pin, the type of output is open drain.
- PIN 7: RA5/SS/AN4:This can be the analog input 4. There is synchronous serial port in the controller also and this pin can be used as the slave select for that port.

PIN Diagram

- PIN 8: RE0/RD/AN5: PORTE starts from pin 8 to pin 10 and this is also a bidirectional input output port. It can be the analog input 5 or for parallel slave port it can act as a ‘read control’ pin which will be active low.
- PIN 9: RE1/WR/AN6: It can be the analog input 6. And for the parallel slave port it can act as the ‘write control’ which will be active low.
- PIN 10: RE2/CS/A7: It can be the analog input 7, or for the parallel slave port it can act as the ‘control select’ which will also be active low just like read and write control pins.
- PIN 11 and 32: VDD: These two pins are the positive supply for the input/output and logic pins. Both of them should be connected to 5V.

PIN Diagram

- PIN 11 and 32: VDD: These two pins are the positive supply for the input/output and logic pins. Both of them should be connected to 5V.
- PIN 12 and 31: VSS: These pins are the ground reference for input/output and logic pins. They should be connected to 0 potential.
- PIN 13: OSC1/CLKIN: This is the oscillator input or the external clock input pin.
- PIN 14: OSC2/CLKOUT: This is the oscillator output pin. A crystal resonator is connected between pin 13 and 14 to provide external clock to the microcontroller. ¼ of the frequency of OSC1 is outputted by OSC2 in case of RC mode. This indicates the instruction cycle rate.

PIN Diagram

- **PIN 15: RC0/T1OCO/T1CKI:** PORTC consists of 8 pins. It is also a bidirectional input output port. Of them, pin 15 is the first. It can be the clock input of timer 1 or the oscillator output of timer 2.
- **PIN 16: RC1/T1OSI/CCP2:** It can be the oscillator input of timer 1 or the capture 2 input/compare 2 output/ PWM 2 output.
- **PIN 17: RC2/CCP1:** It can be the capture 1 input/ compare 1 output/ PWM 1 output.
- **PIN 18: RC3/SCK/SCL:** It can be the output for SPI or I2C modes and can be the input/output for synchronous serial clock.
- **PIN 23: RC4/SDI/SDA:** It can be the SPI data in pin. Or in I2C mode it can be data input/output pin.
- **PIN 24: RC5/SDO:** It can be the data out of SPI in the SPI mode.
- **PIN 25: RC6/TX/CK:** It can be the synchronous clock or USART Asynchronous transmit pin.

PIN Diagram

- **PIN 26: RC7/RX/DT:** It can be the synchronous data pin or the USART receive pin.
- **PIN 19,20,21,22,27,28,29,30:** All of these pins belong to PORTD which is again a bidirectional input and output port. When the microprocessor bus is to be interfaced, it can act as the parallel slave port.
- **PIN 33-40: PORT B:** All these pins belong to PORTB. Out of which RB0 can be used as the external interrupt pin and RB6 and RB7 can be used as in-circuit debugger pins.