ADC in PIC Microcontroller

Analog to digital conversion module in PIC microcontroller usually has 5-i/ps for 28-pin devices and also 8-i/ps for 40-pin devices.

The change of analog signal to the PIC, ADC module effects in equivalent 10-bit digital number.

The ADC module with a microcontroller has a software selectable low and high voltage reference i/p to some combination of VSS, VDD, RA2 & RA3

we will convert analog input to digital number with a high voltage reference and low voltage reference.

The o/p will be shown using LEDs. You can alter the reference voltages by arranging the ADCON1 register.
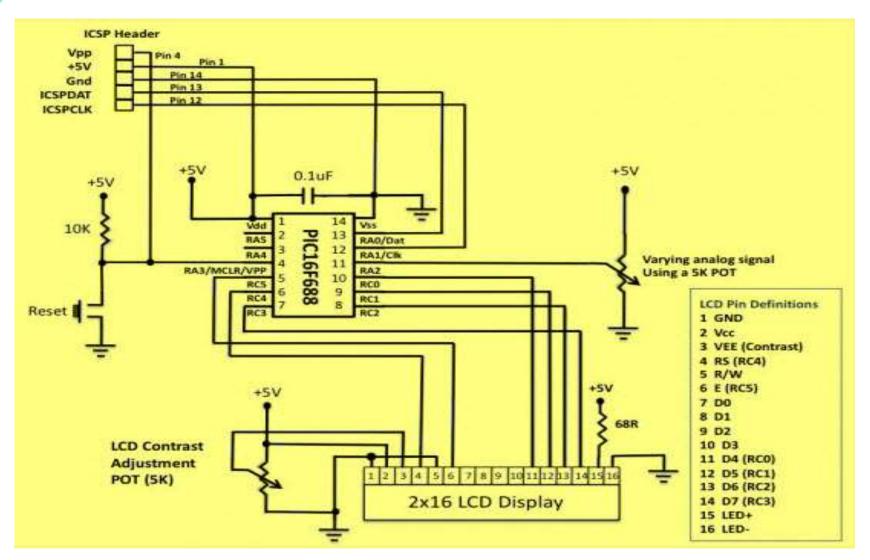
Circuit Diagram of ADC in PIC Microcontroller

The circuit diagram of the 10-bit analog to digital converter using PIC microcontroller is shown below. The test i/p voltage of ADC is received from a 5k potentiometer connected across the potentiometer, and it connects to the two pins (AN2/RA2) of the PIC microcontroller. The [power supply](#) is selected as the reference voltage for analog to digital conversion. Thus, the 10-bit A/D converter will change any analog voltage to a digital. The output will be displayed on the LCD display.

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Software Required

The programming of A/D conversion in PIC microcontroller includes arranging the registers like ADCON0, ADCON1, and ANSEL.

• ADCON0 register is used to choose the analog i/p channel, start the conversion and to check the conversion is completed or not and also switch ON/OFF the module.

• ADCON1 register is used to choose voltage reference, and to arrange ports as an analog to digital

• ADCON2 register is used to choose the A/D data format, fix an acquisition time, A/D clock setup.

As an analog input AN2/RA2 is used, the equivalent ANSEL register must be fixed. In register ADCON0, clear HS0 & CHS2 and set CHS1, so that the channel AN2 will be associated with the internal S&H circuit (sample and hold circuit). In the ADCON1 register, clearing the VCFG bit will choose the voltage supply for analog to digital conversion. This register is used to select the CLK source in analog to digital conversion. Though, the MikroC Pro for microcontroller has got a built-in library function termed as ADC_Read (), by default, uses the internal RC CLK for ADC operation. So no need to reset the ADCON1 register.