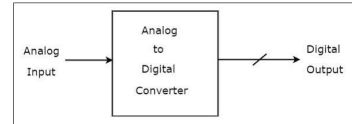


Analog to Digital Converter (ADC)

Dr Abhijit Yadav

An Analog to Digital Converter (ADC) converts an analog signal into a digital signal. The digital signal is represented with a binary code, which is a combination of bits 0 and 1.

The block diagram of an ADC is shown in the following figure



An Analog to Digital Converter (ADC) consists of a single analog input and many binary outputs. In general, the number of binary outputs of ADC will be a power of two.

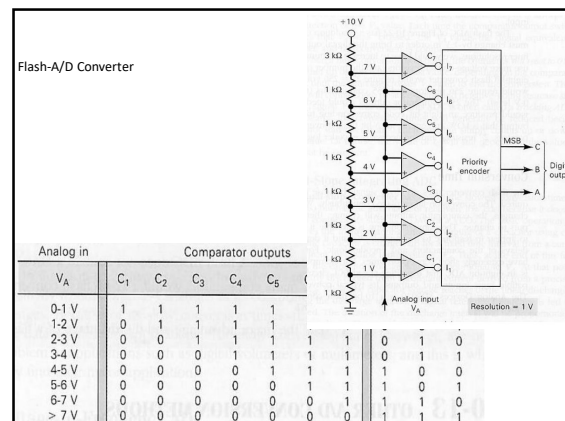
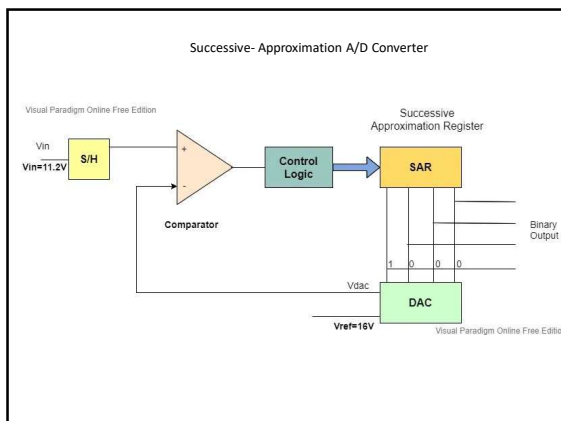
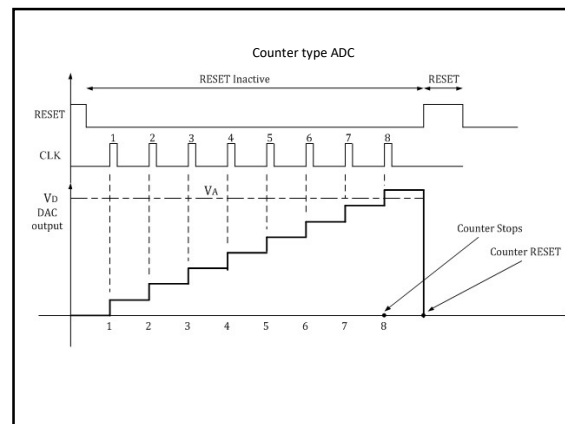
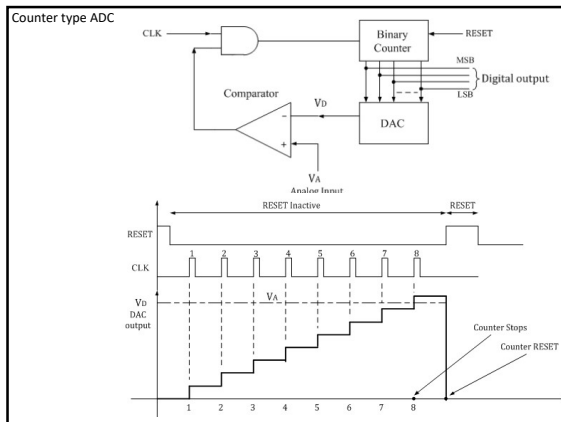
There are two types of ADCs: Direct type ADCs and Indirect type ADC. If the ADC performs the analog to digital conversion directly by utilizing the internally generated equivalent digital (binary) code for comparing with the analog input, then it is called as Direct type ADC.

The following are the examples of Direct type ADCs –

Counter type ADC

Successive Approximation ADC

Flash type ADC



Flash-A/D Converter

Analog in		Comparator outputs							Digital outputs		
V_A		C_1	C_2	C_3	C_4	C_5	C_6	C_7	C	B	A
0-1 V		1	1	1	1	1	1	1	0	0	0
1-2 V		0	1	1	1	1	1	1	0	0	1
2-3 V		0	0	1	1	1	1	1	0	1	0
3-4 V		0	0	0	1	1	1	1	0	1	1
4-5 V		0	0	0	0	1	1	1	1	0	0
5-6 V		0	0	0	0	0	1	1	1	0	1
6-7 V		0	0	0	0	0	0	1	1	1	0
> 7 V		0	0	0	0	0	0	0	1	1	1

(b)