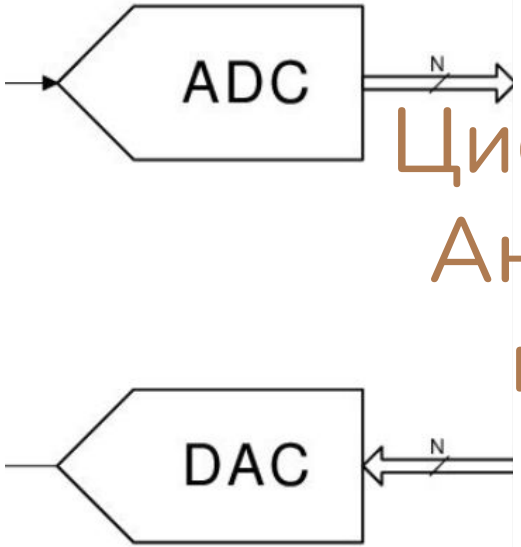


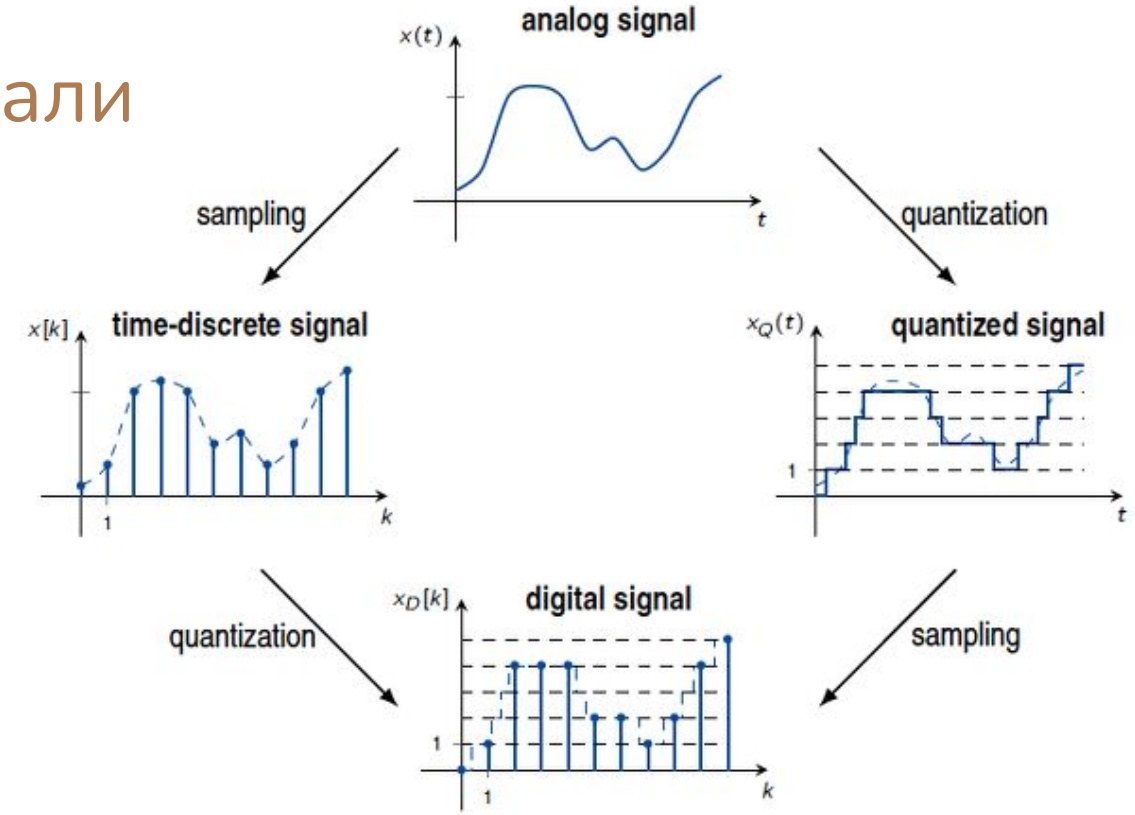
Сигнали, Цифрово-Аналогови и Аналогово-Цифрови преобразуватели

Иван Стефанов, ТУЕС 2022

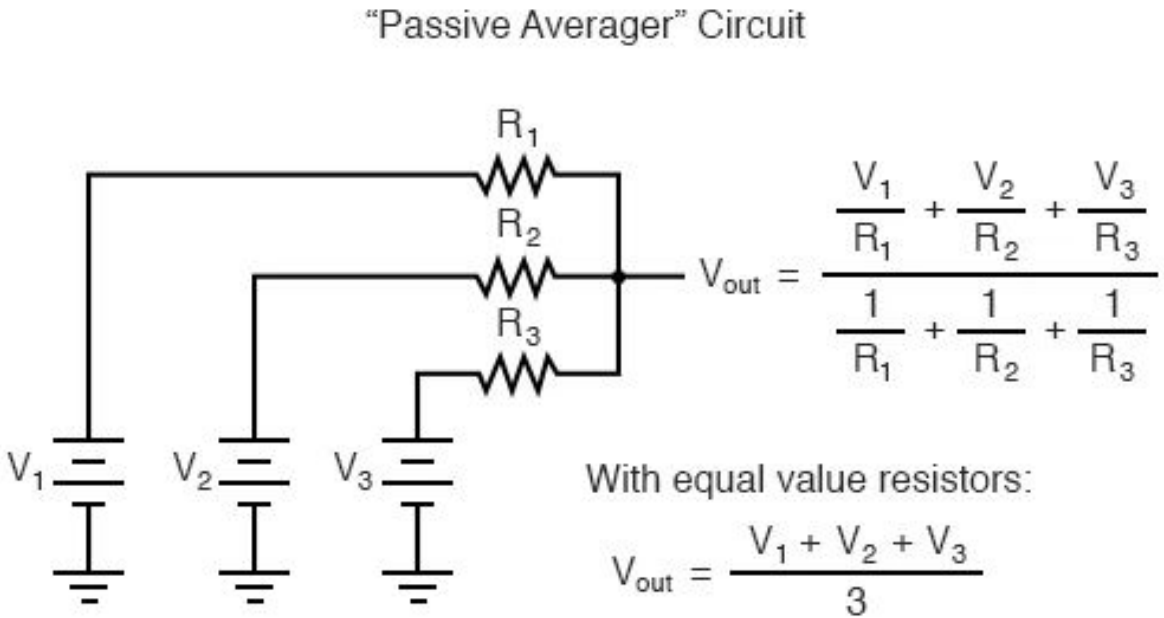
Какво е сигнал ?

Видове сигнали

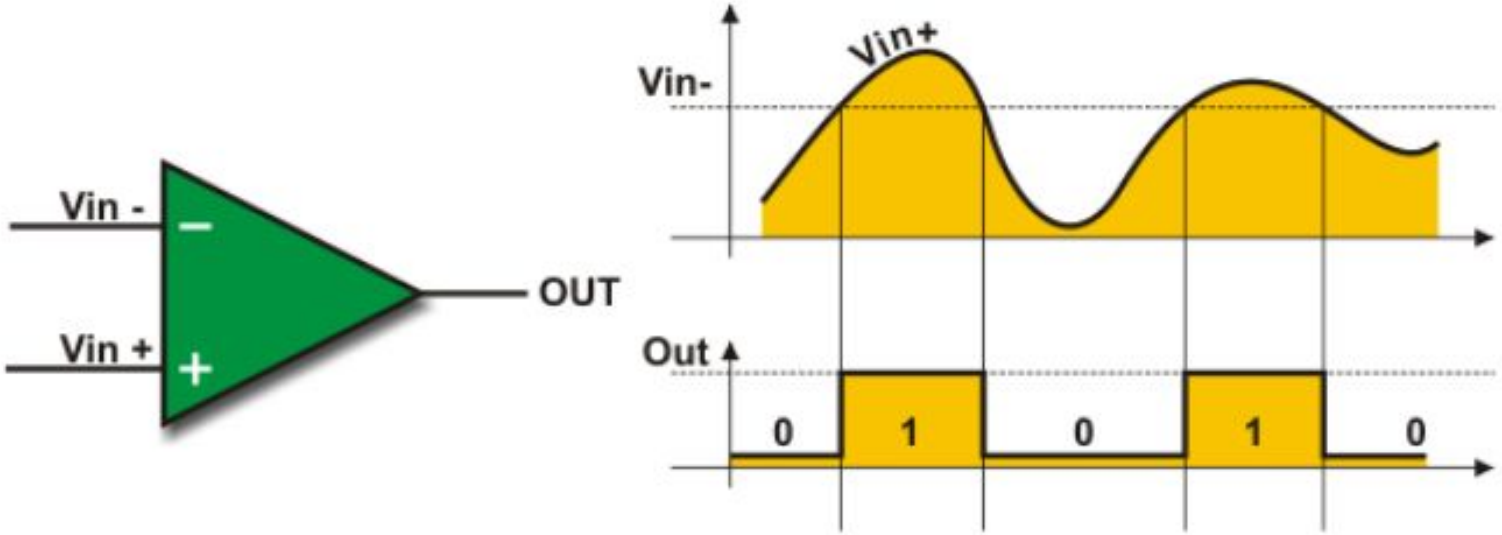
- ➔ аналогов
- ➔ цифров
- ➔ непрекъснат
- ➔ прекъснат



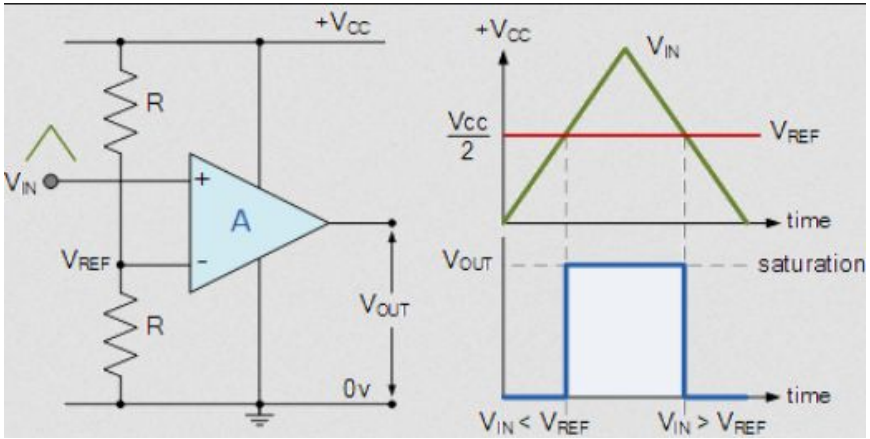
Резисторен делител/суматор на напрежение

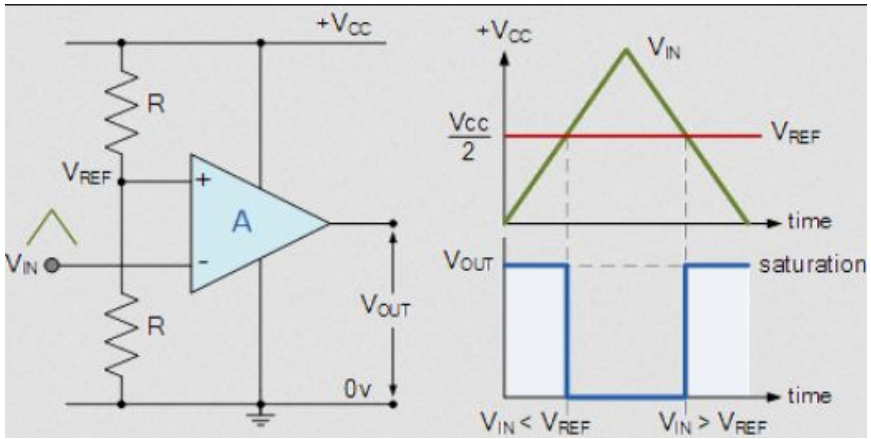


Сравнител на напрежения

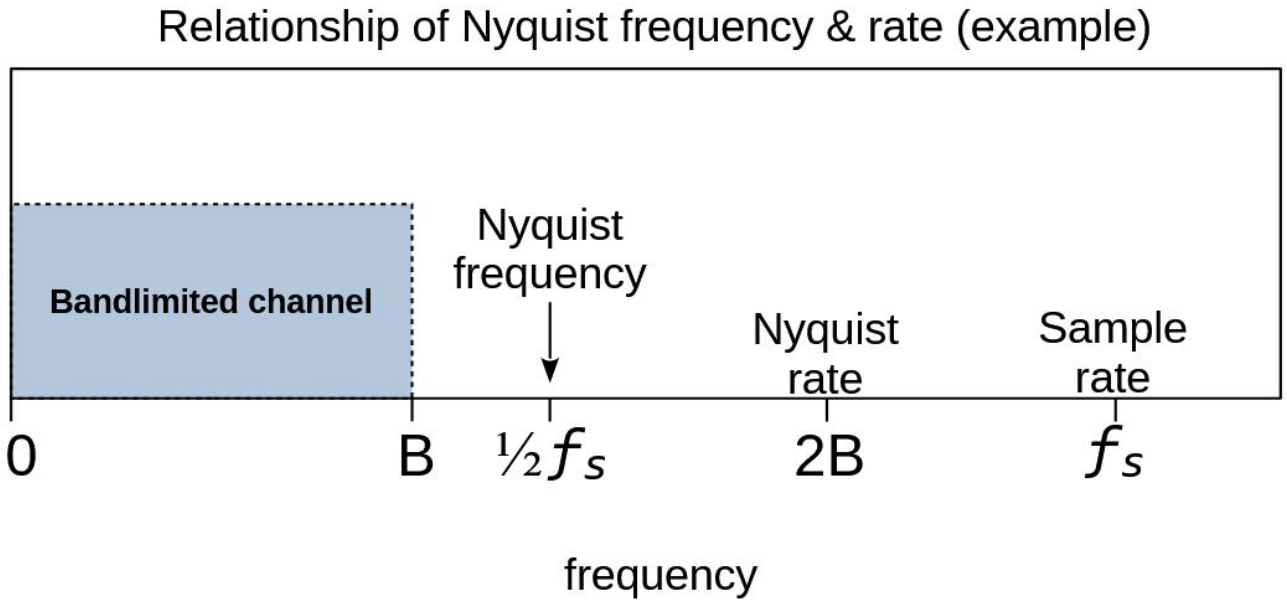


Сравнител на напрежения

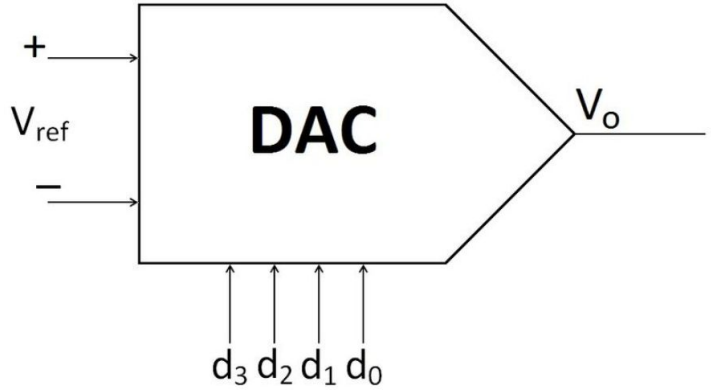




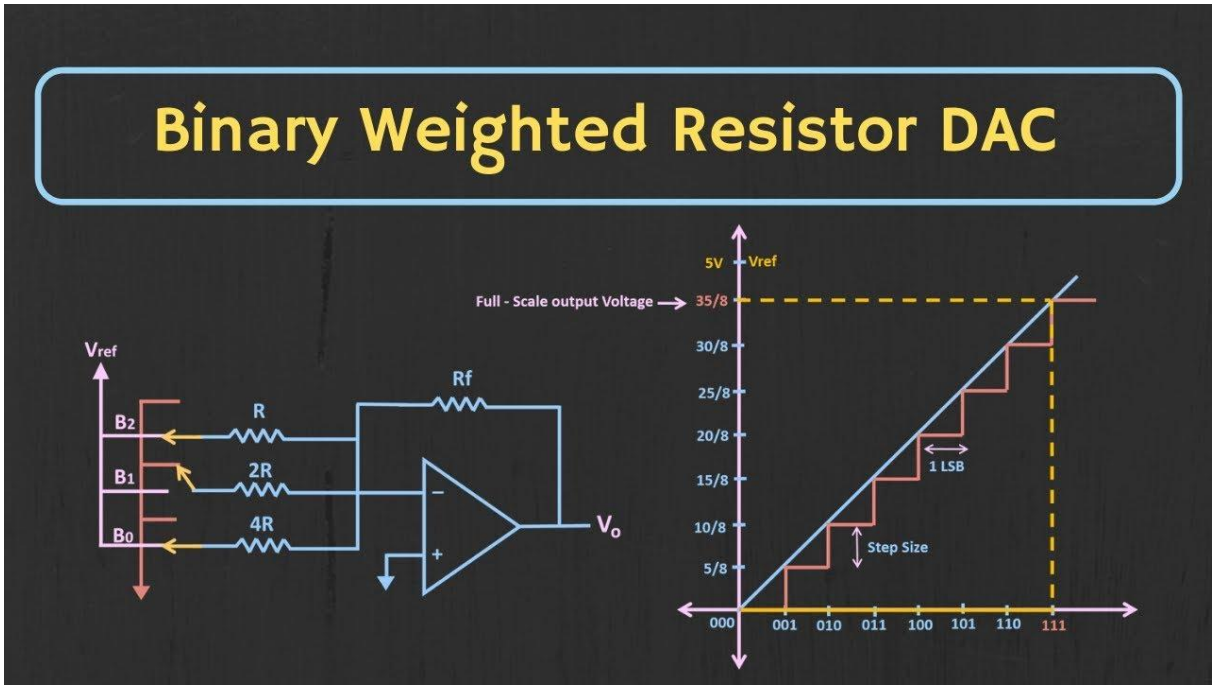
Теорема на Найкуист



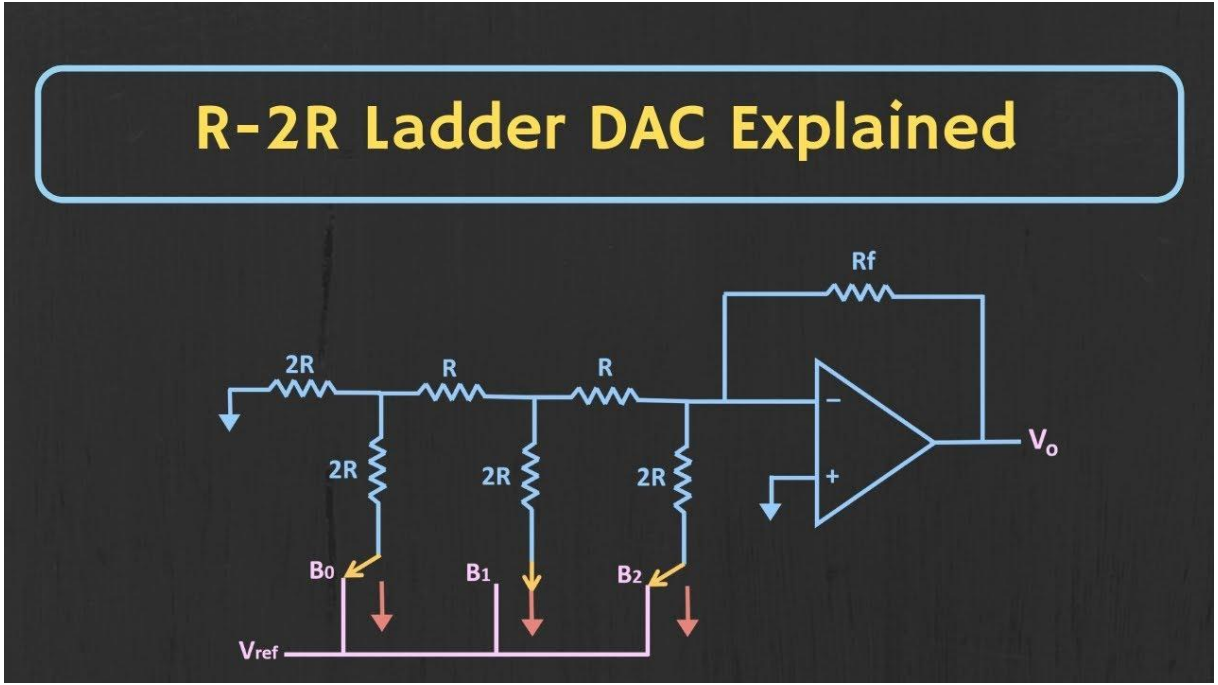
Цифрово-Аналогови преобразуватели

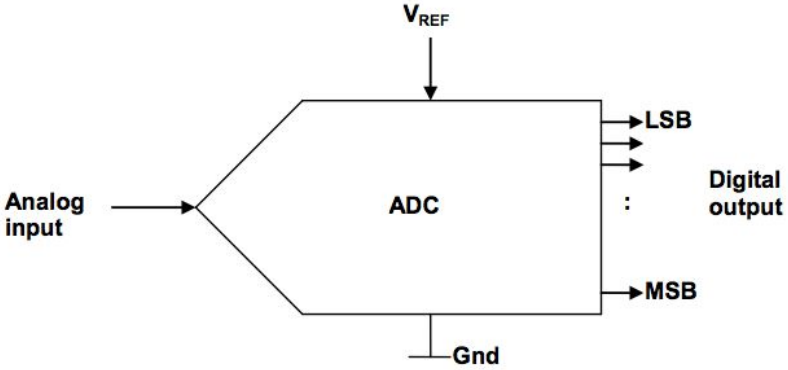


Binary weighted DAC



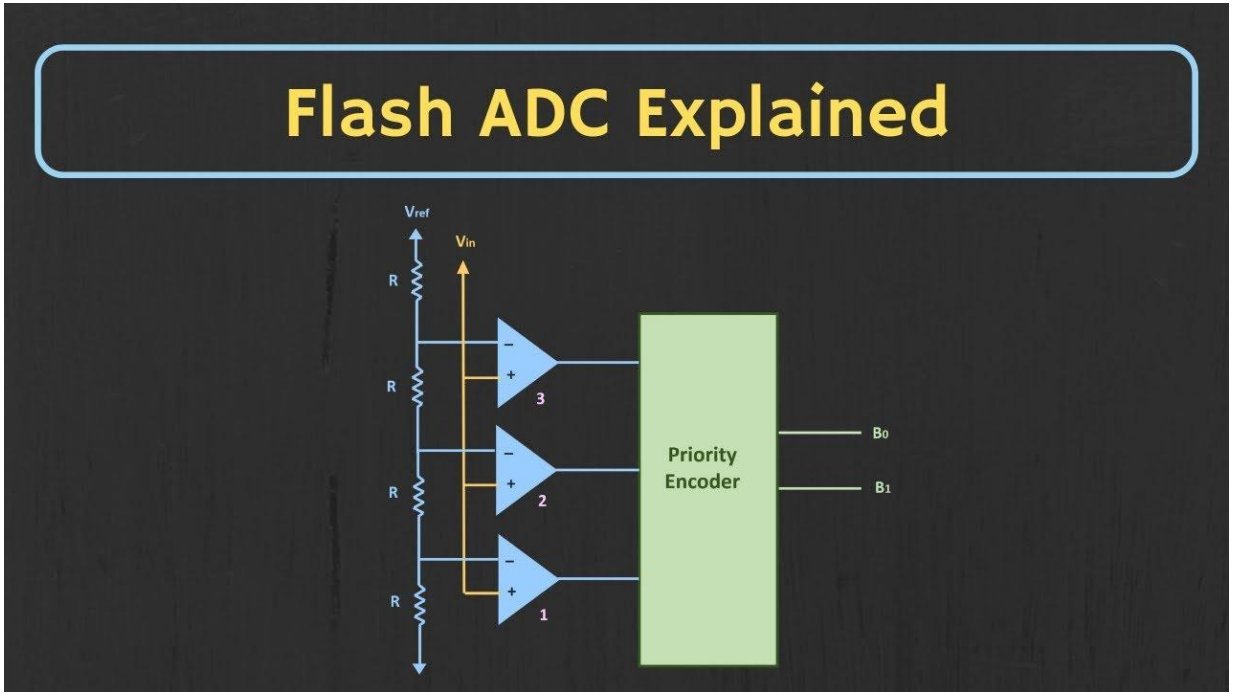
R-2R Ladder DAC



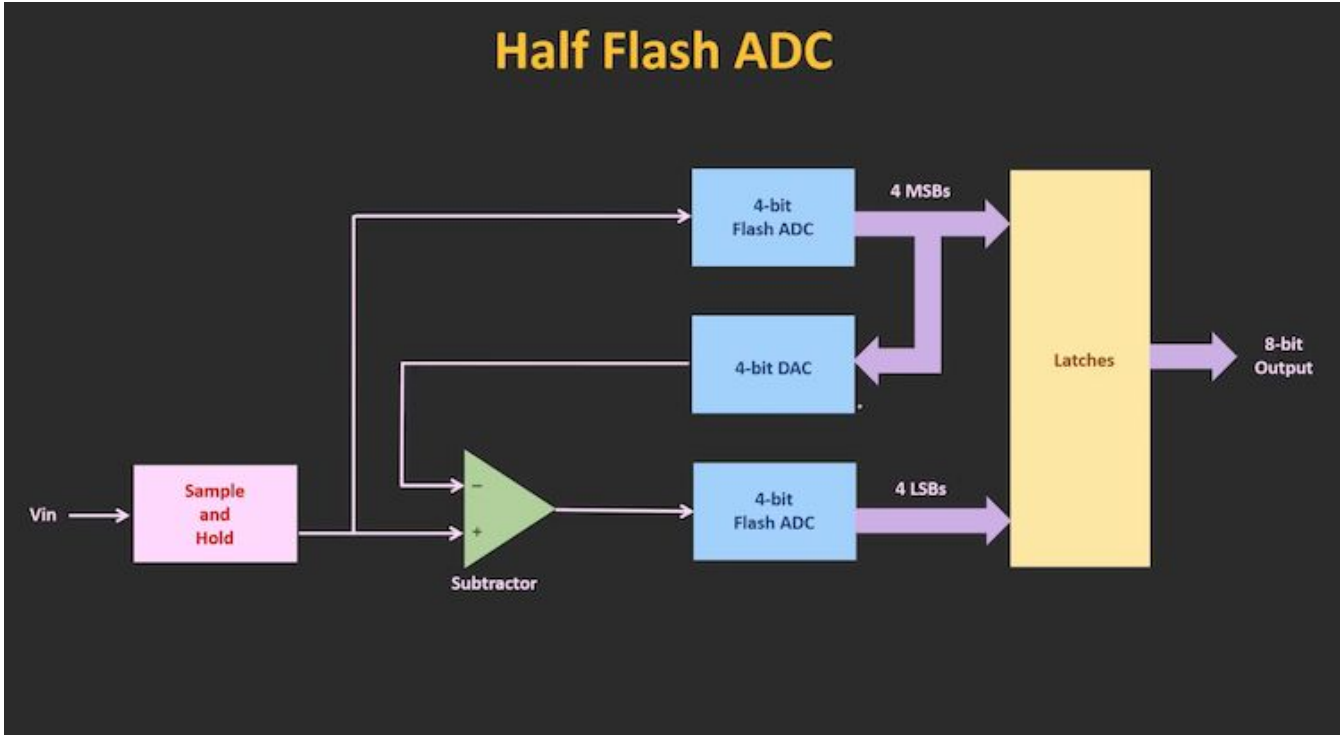


Аналогово-Цифрови преобразователи

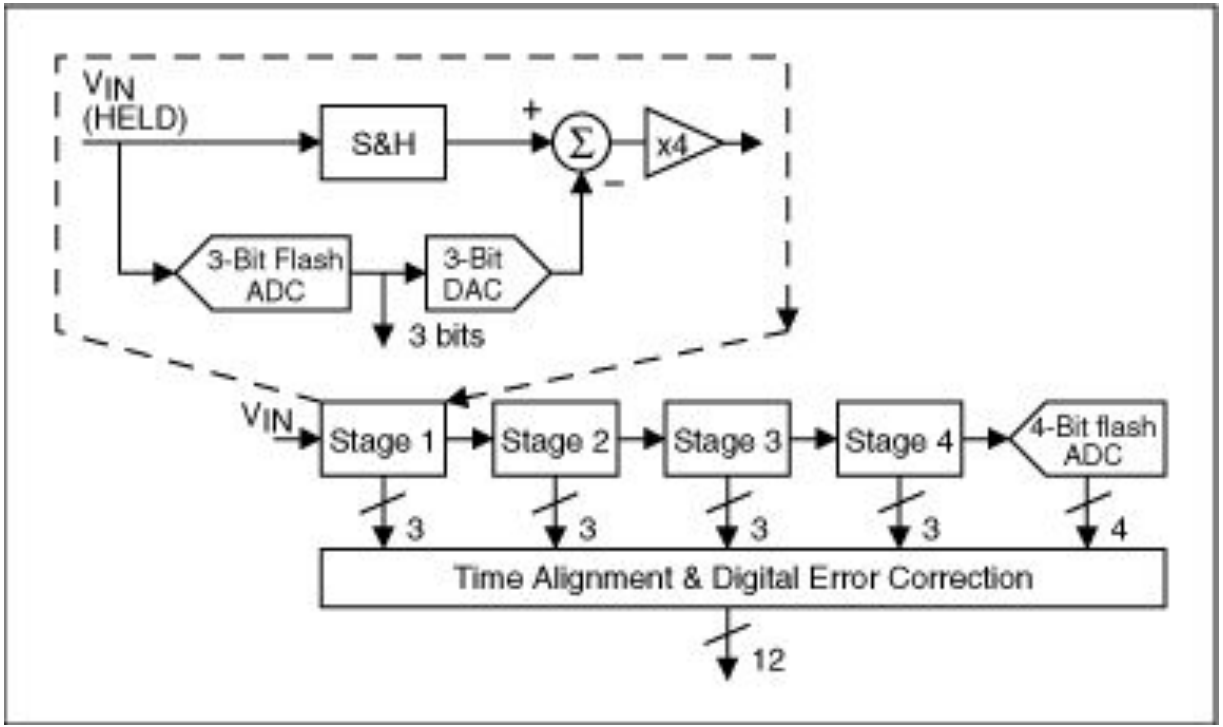
Parallel/Flash ADC



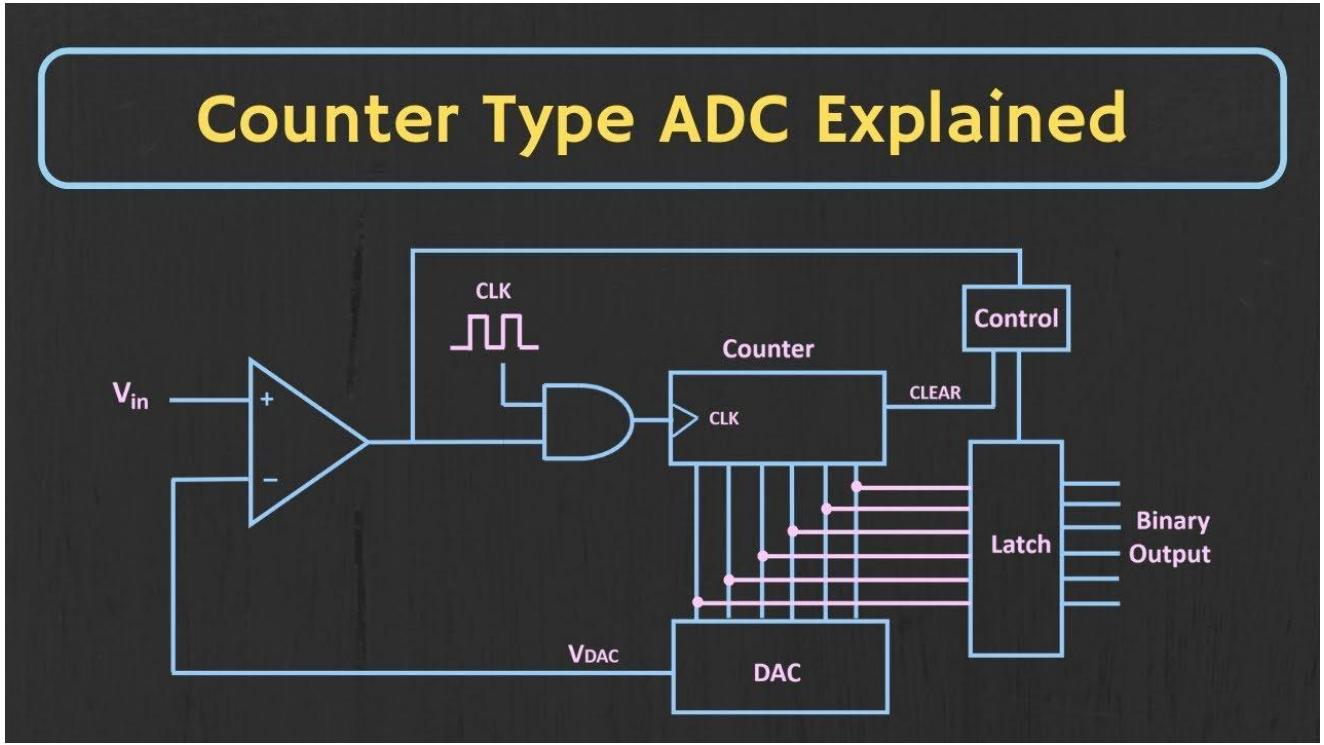
Pipeline (Half-Parallel/Flash) ADC



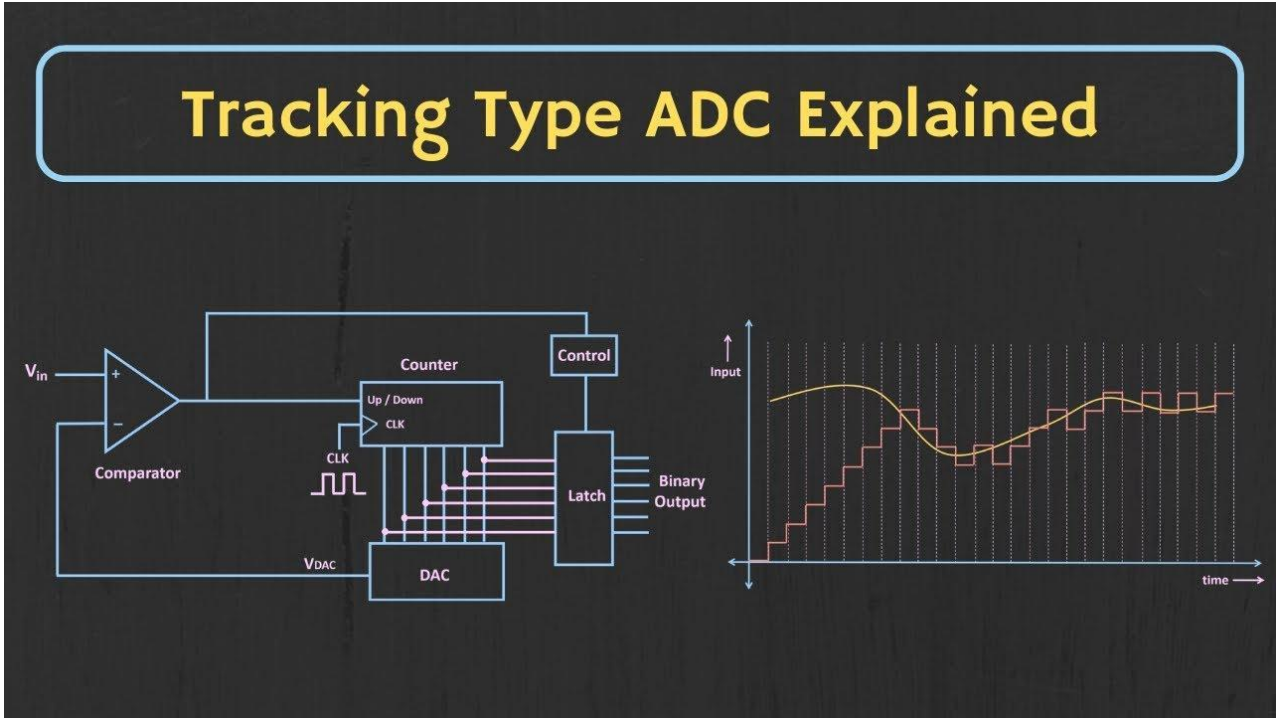
Pipeline (Half-Parallel/Flash) ADC



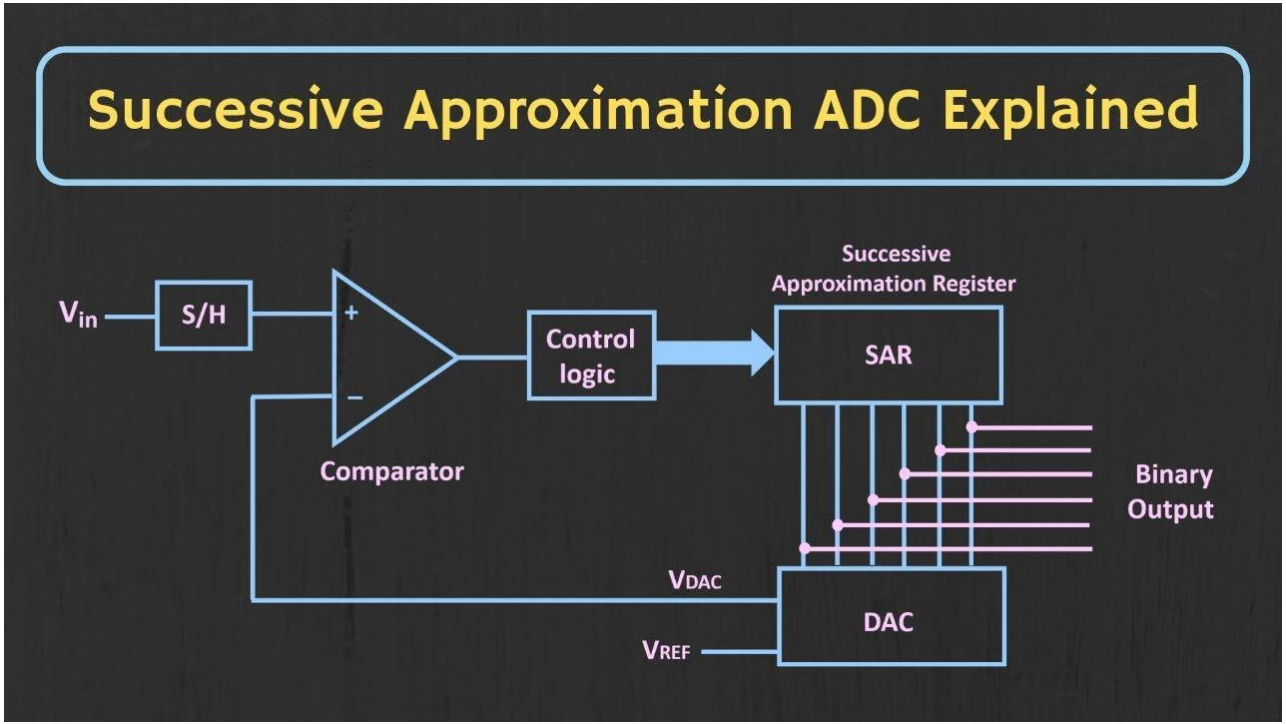
Counter ADC


Counter Type ADC Explained
CLK
Control
Counter
V_{in}
+
−
CLK
CLEAR
Latch
Binary
Output
V_{DAC}
DAC

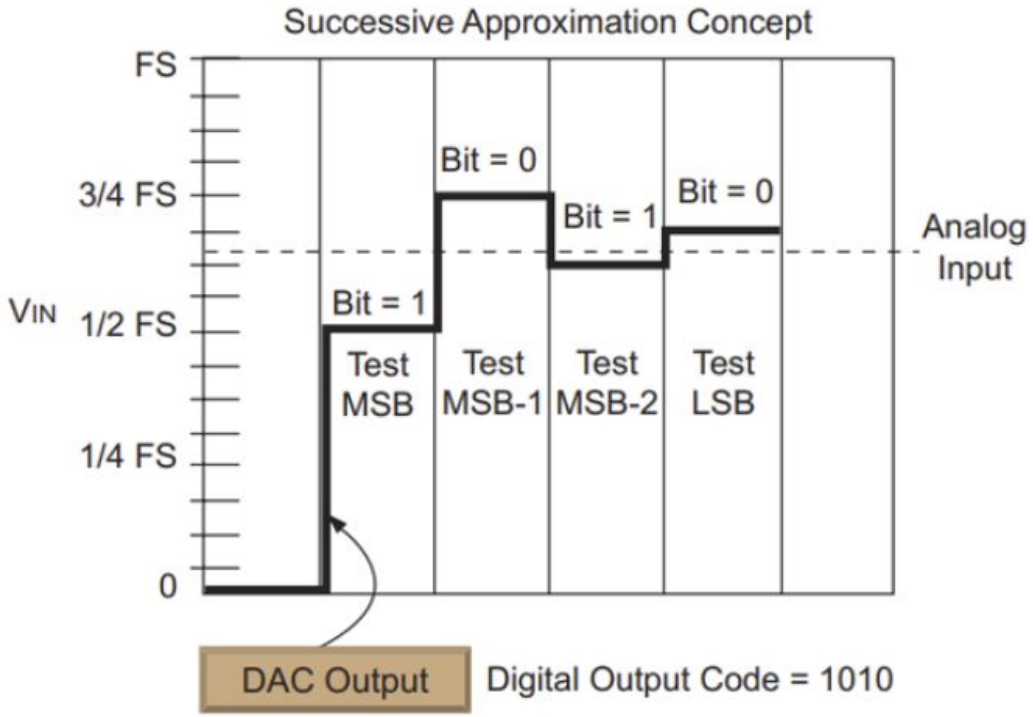
Tracking ADC



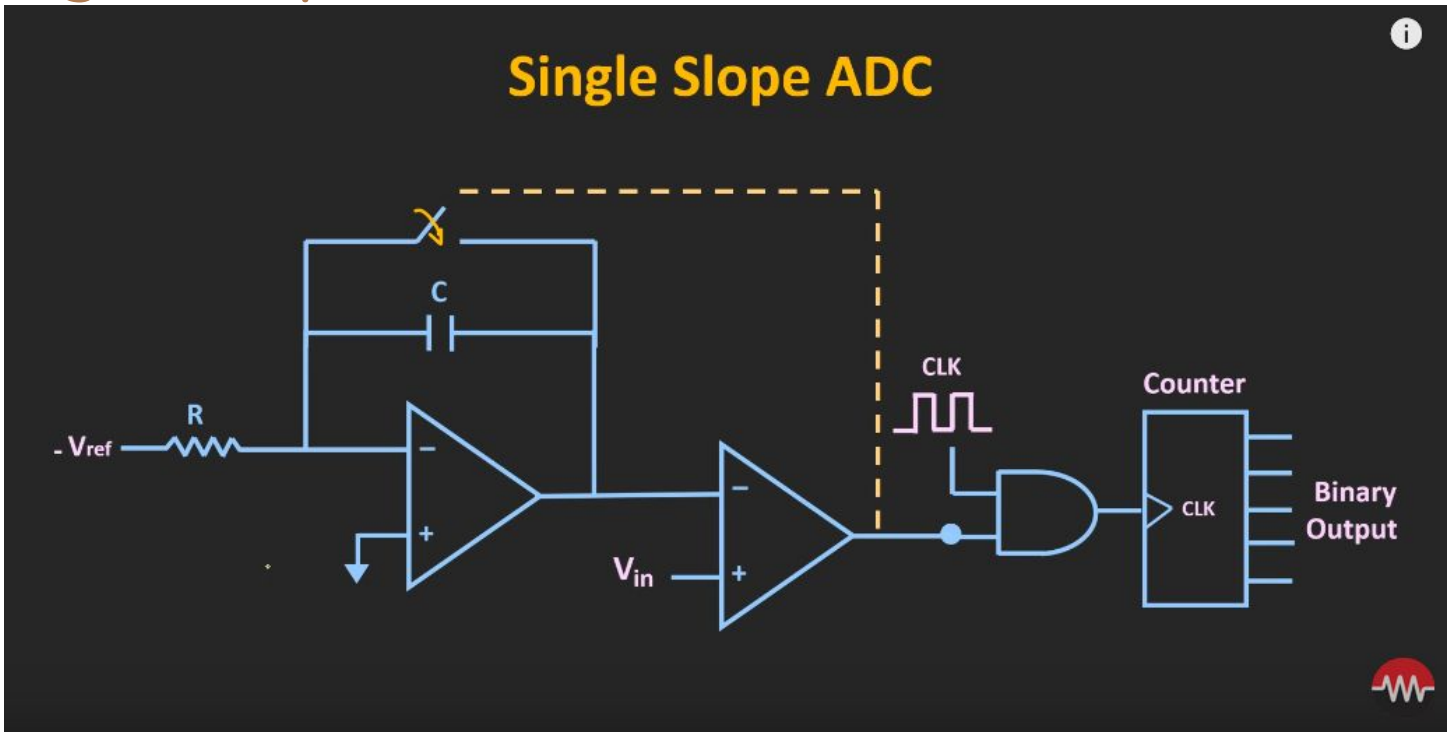
Successive Approximation (SAR) ADC



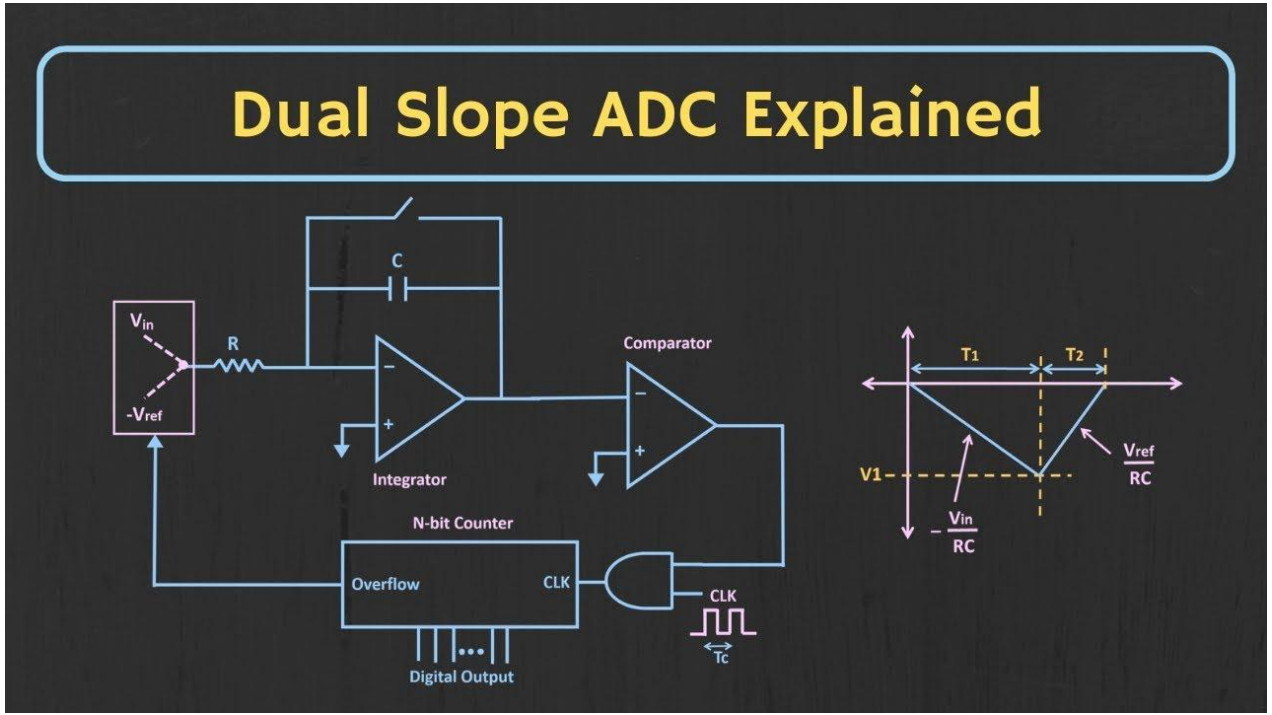
Successive Approximation (SAR) ADC



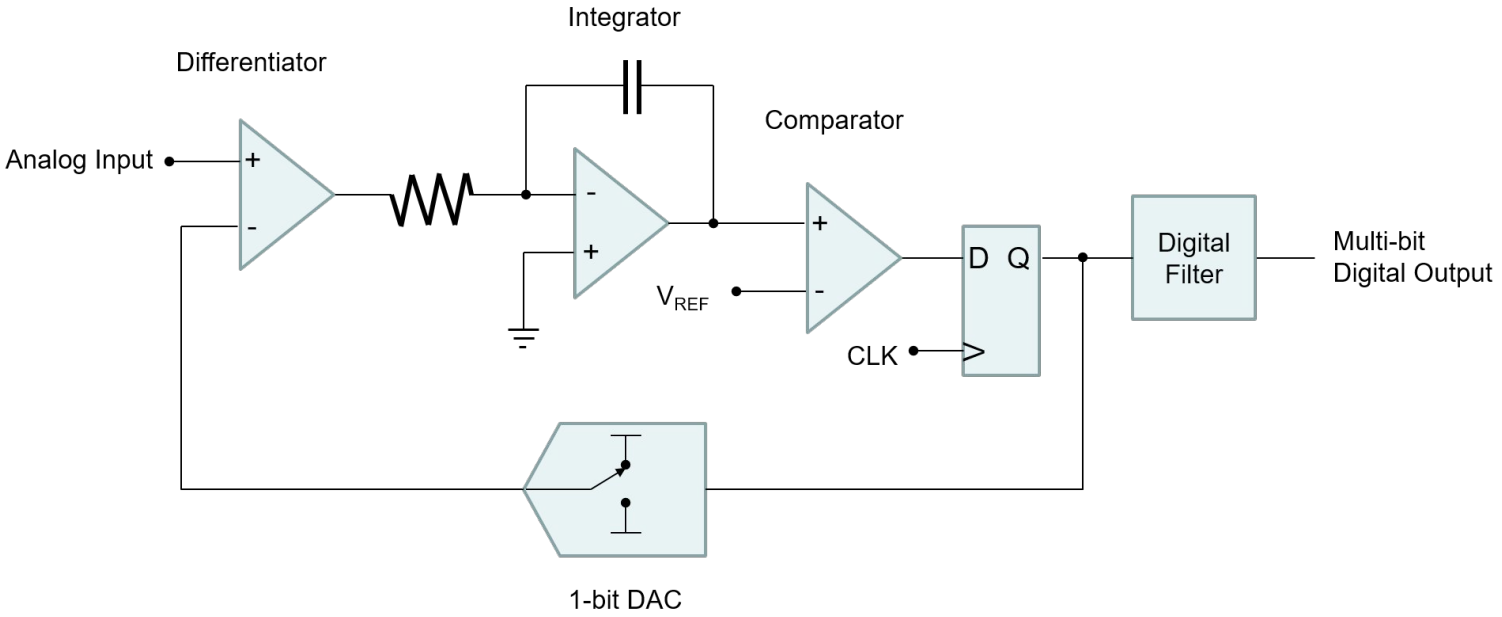
Single slope ADC



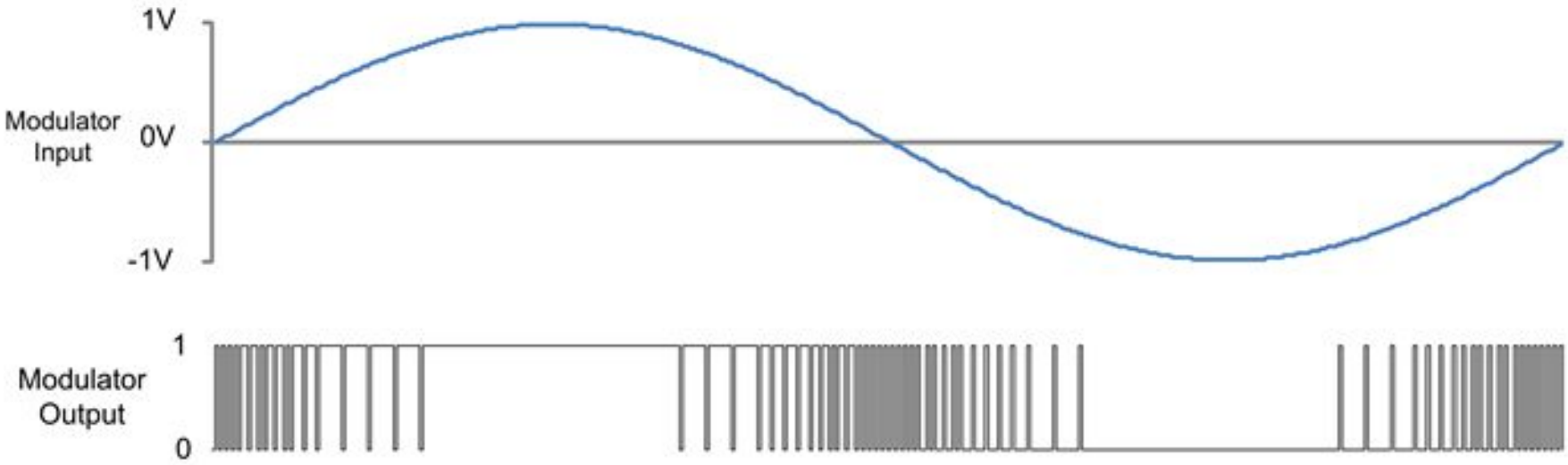
Dual slope ADC (+ Multi slope ?)



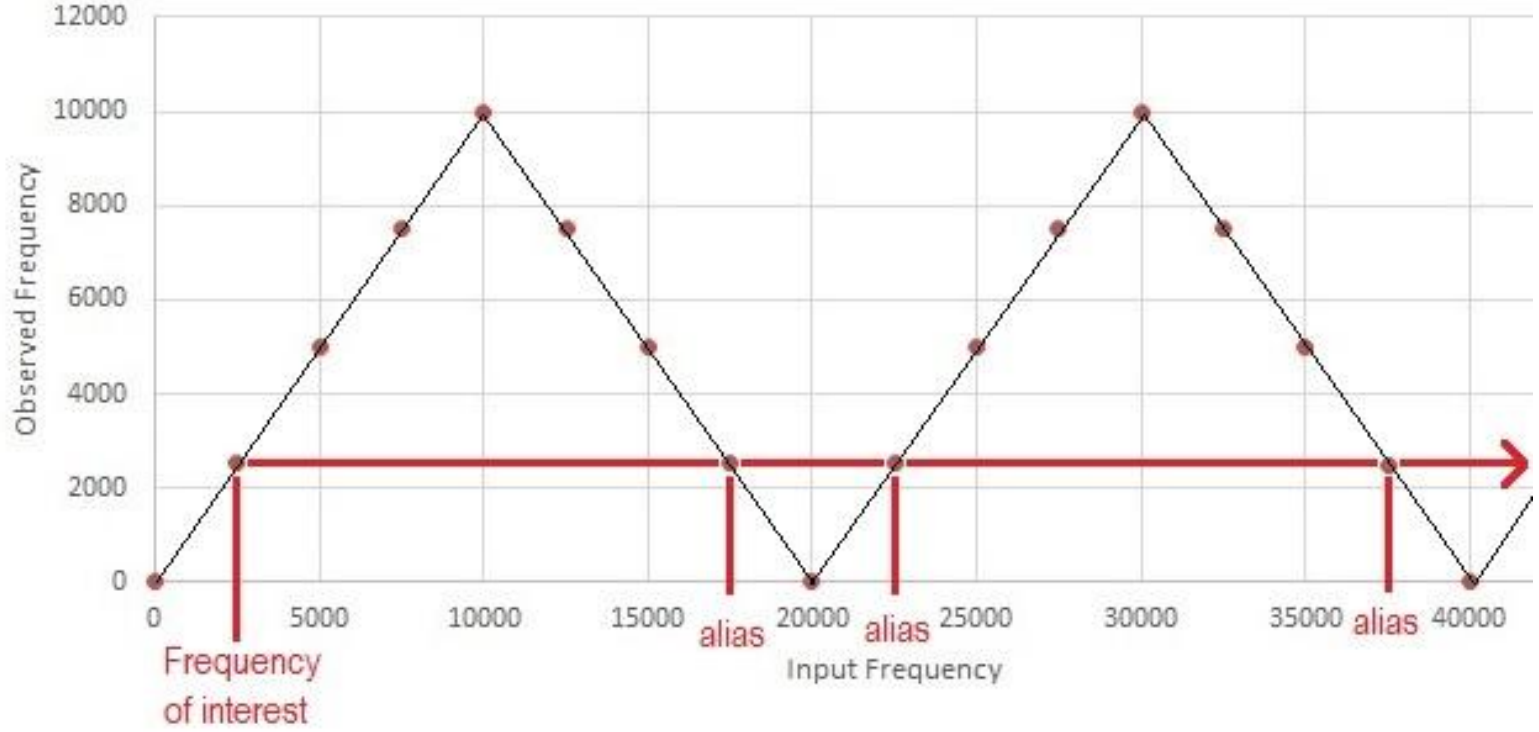
Sigma-Delta / Charge Balancing ADC



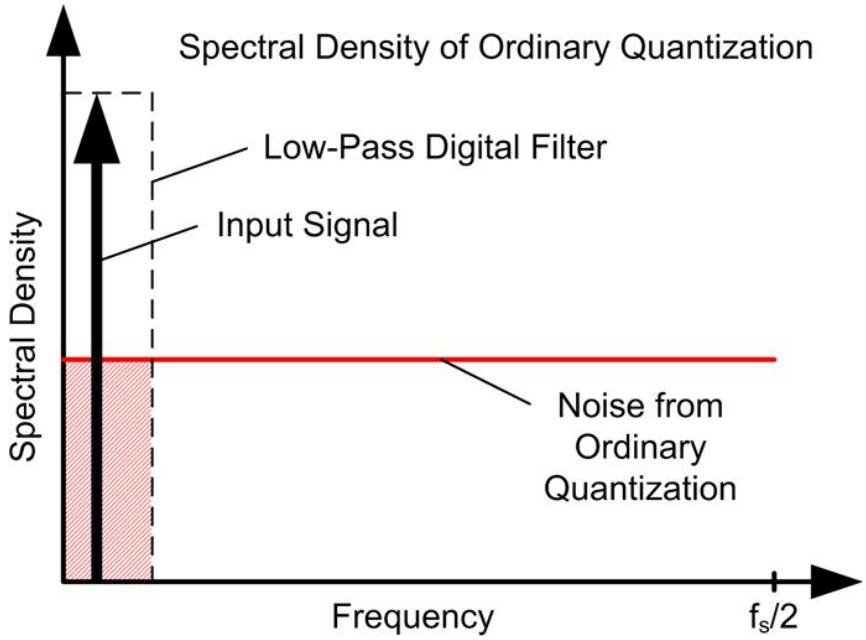
Sigma-Delta / Charge Balancing ADC

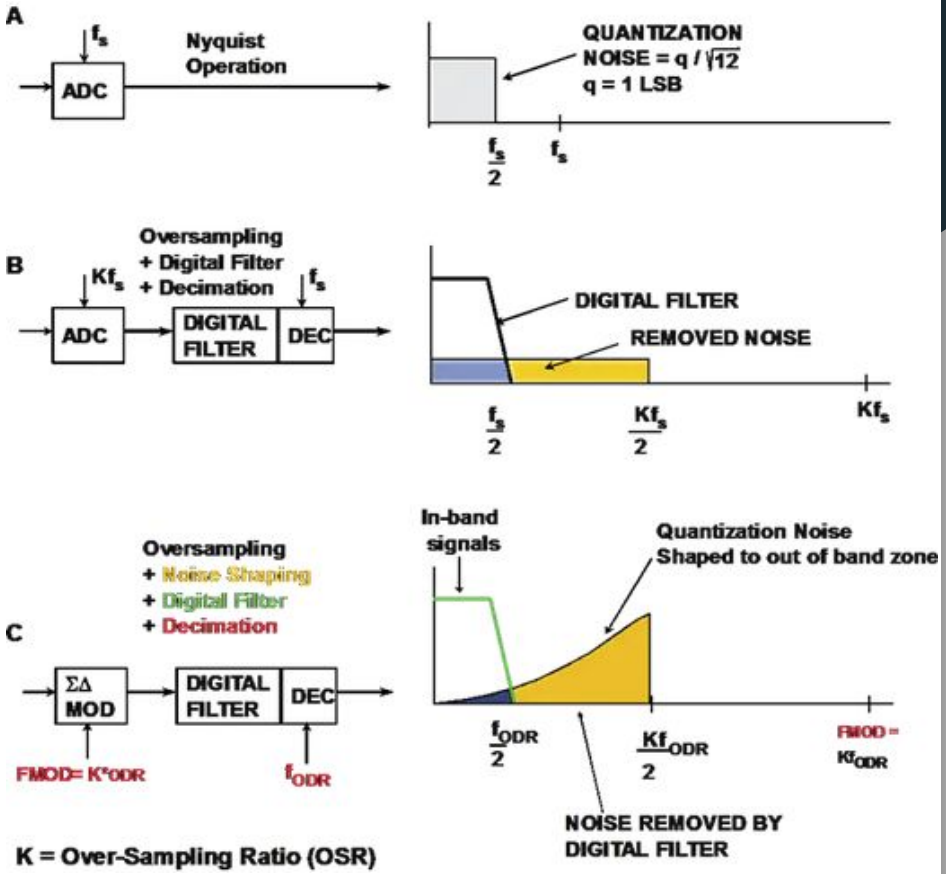


Aliasing


12000
10000
8000
6000
4000
2000
0
Observed Frequency
0
5000
10000
15000
20000
25000
30000
35000
40000
Frequency of interest
alias
alias
alias
Input Frequency

Oversampling





Почивка