Mikroişlemci Sistemleri

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10

YTÜ-CE

Ders-10 Konular

- DAC (digital to analog converter)
  - Binary weighted DAC
  - R/2R ladder DAC
  - DAC entegresi : DAC0830
  - DAC örneği

- ADC (analog to digital converter)
  - Parallel ADC
 - Ramp converter ADC
  - ADC entegresi : ADC0804
  - ADC örneği

DAC – digital to analog converter
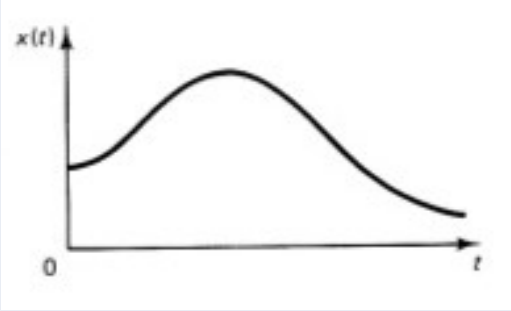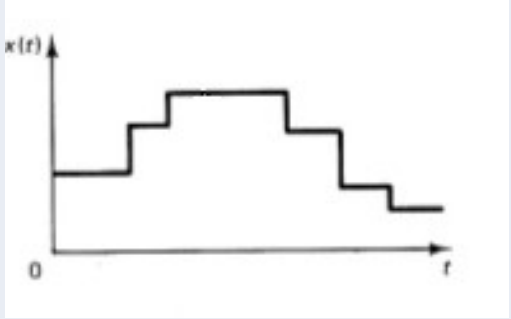# ADC – analog to digital converter

- μP dijital değerlerle çalışır, ama fiziki dünya analogtur.

- Sıcaklık, basınç, nem, hız, ses … : analog değerlerdir.

- Fiziki dünya ile μP arasında etkileşim için Analog$\longleftrightarrow$Dijital dönüştürücü gerekli.

DAC – digital to analog converter
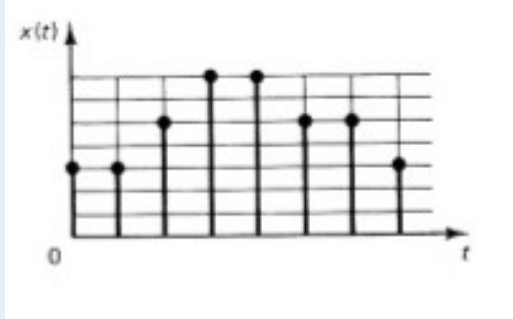# ADC – analog to digital converter
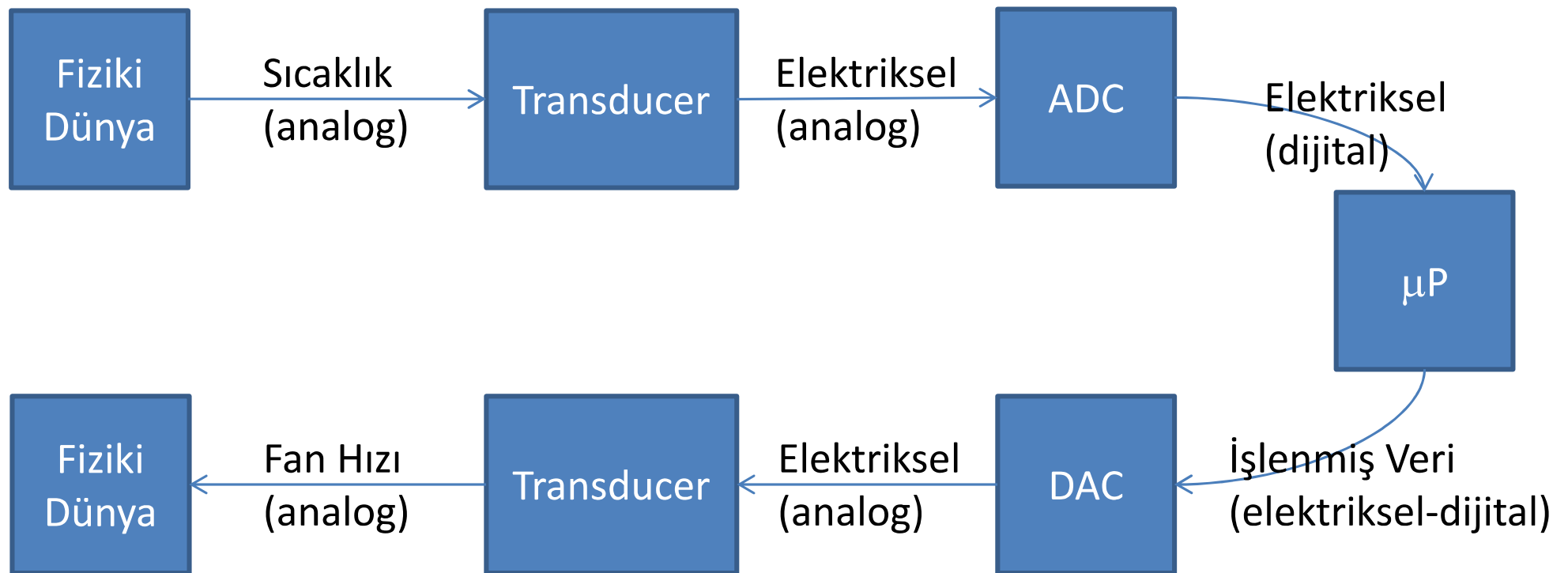
Analog-Dijital Sinyal

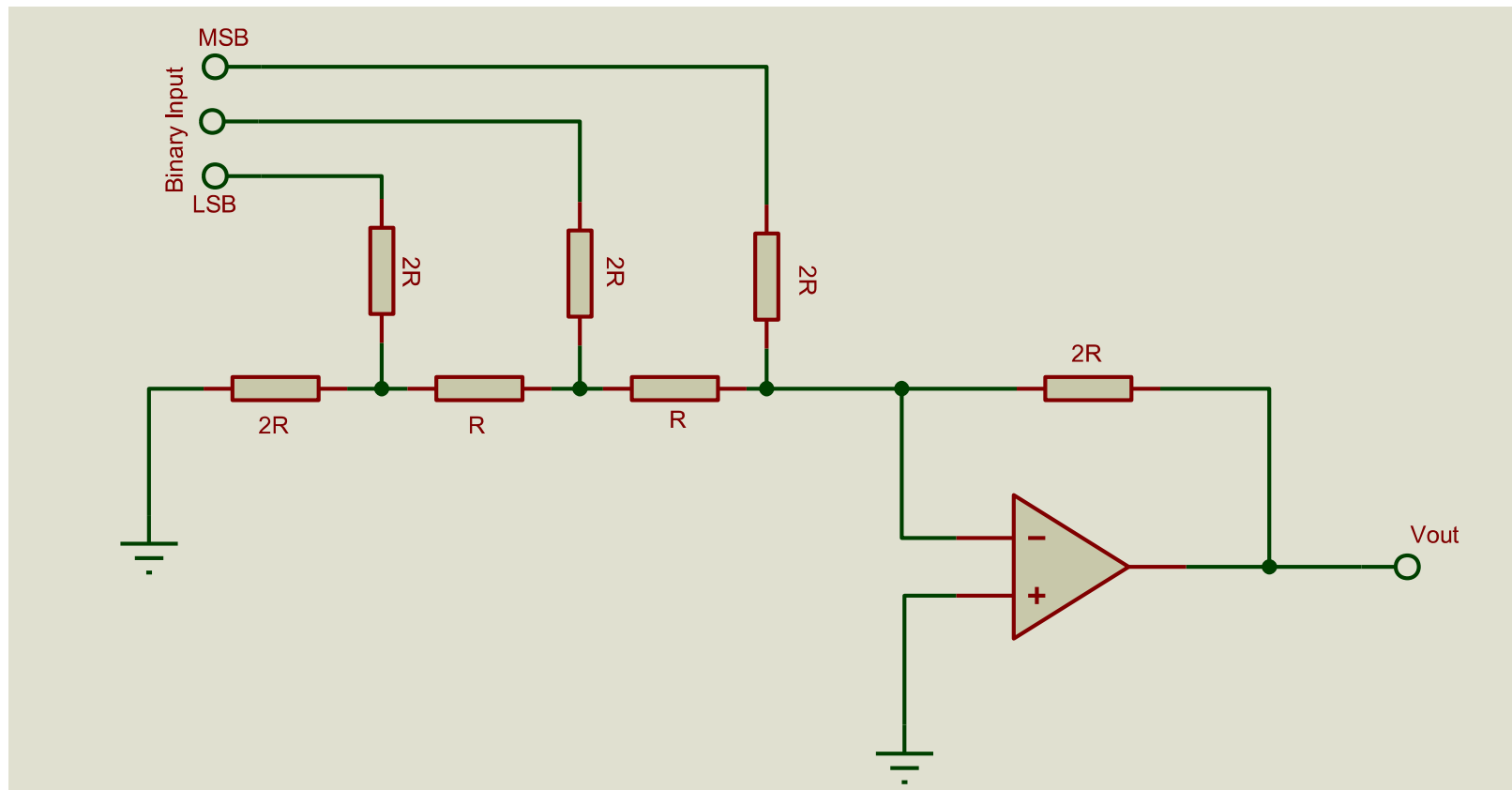|	Zamanda Sürekli Sinyal	Zamanda Ayrık Sinyal
Genliği Sürekli Sinyal		
Genliği Ayrık Sinyal		

DAC (digital to analog converter)
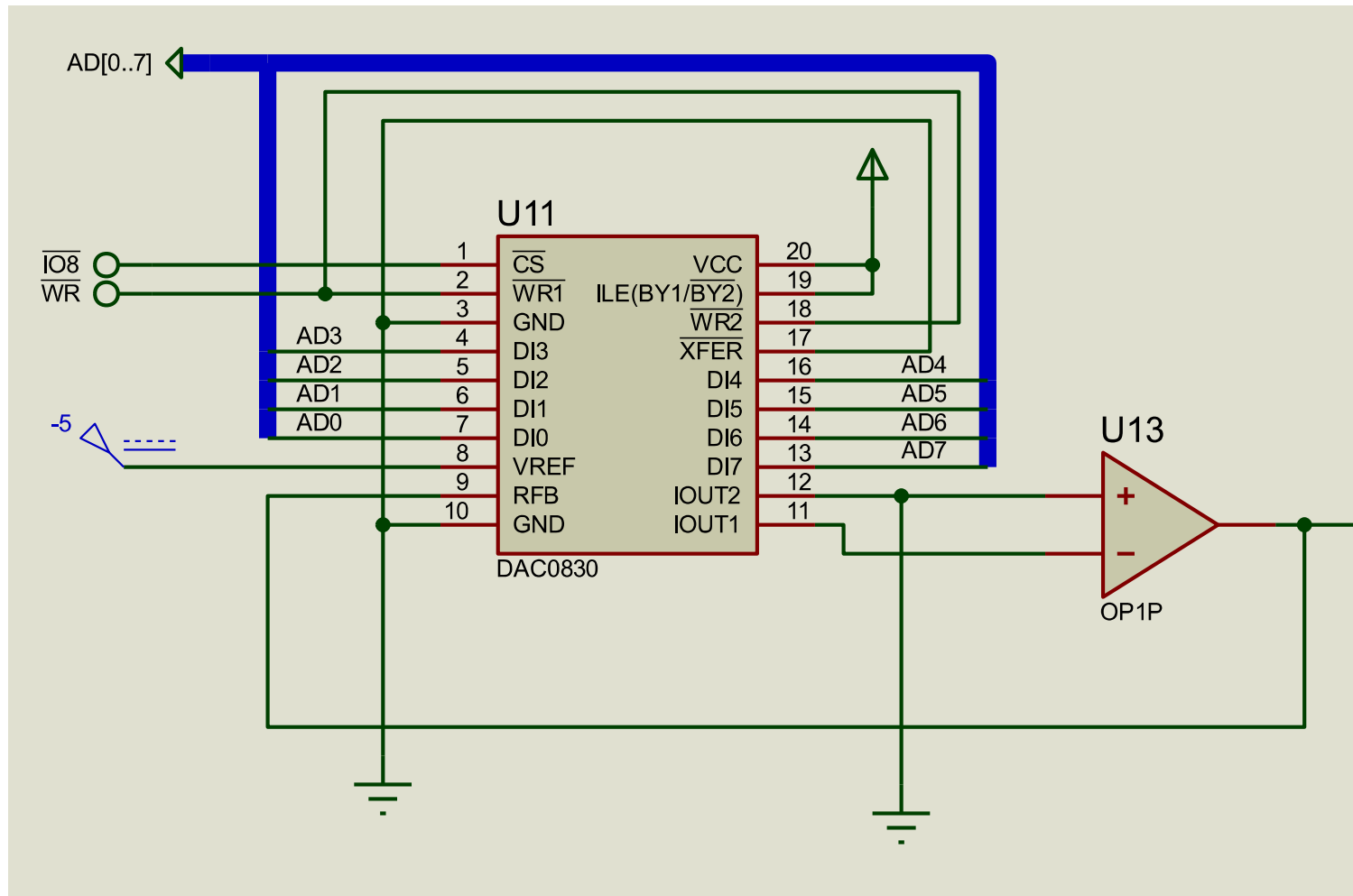
Binary weighted DAC
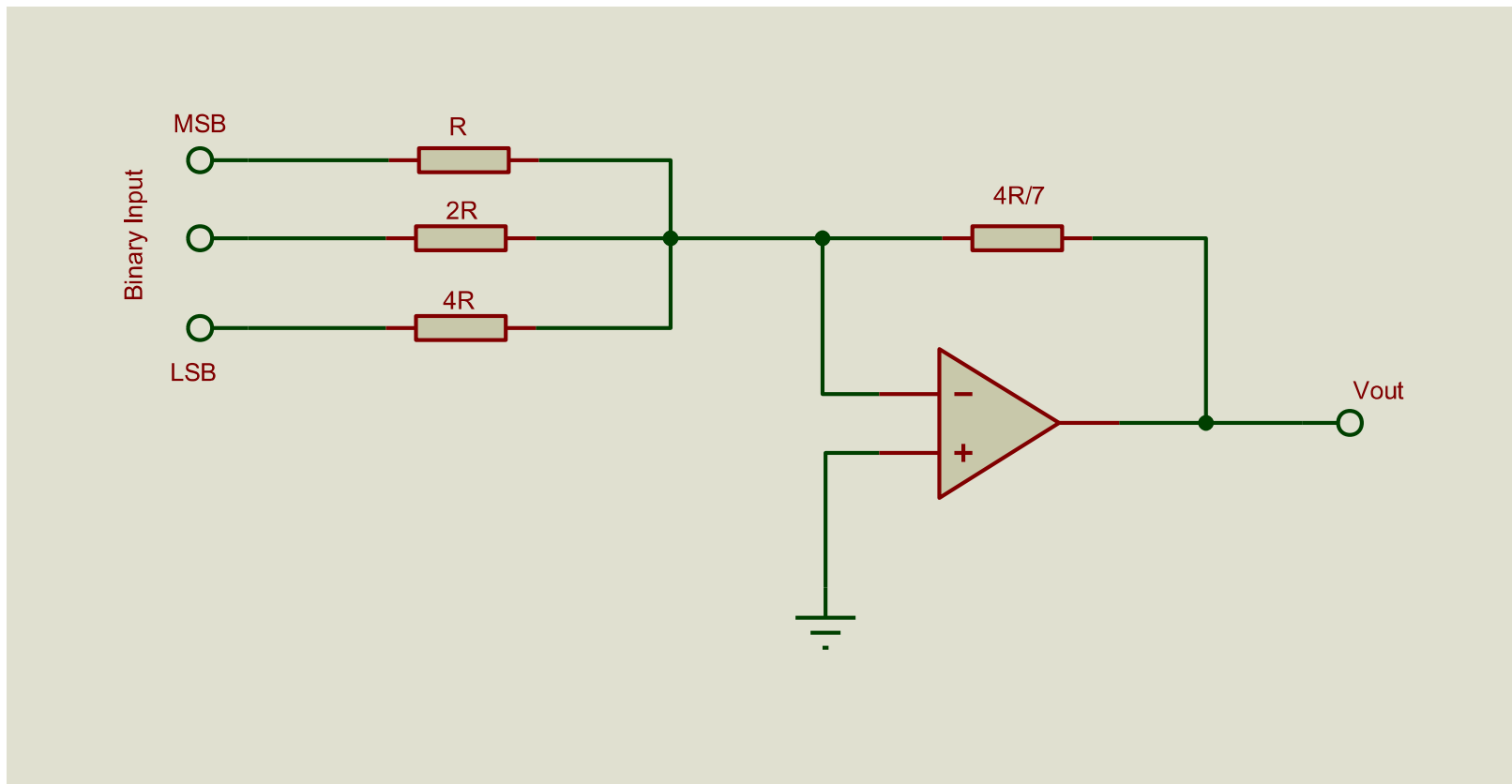
DAC (digital to analog converter)

R/2R ladder DAC

DAC0830

DAC0830

$\overline{CS}$: **Chip Select** (active low). The CS in combination with ILE will enable WR1.

ILE: Input Latch Enable (active high). The ILE in combination with CS enables WR1.

$\overline{\textbf{WR}_\textbf{1}}$: **Write 1.** The active low WR1 is used to load the digital input data bits (DI) into the input latch. The data in the input latch is latched when WR1 is high. To update the input latch–CS and WR1 must be low while ILE is high.

$\overline{\textbf{WR}_\textbf{2}}$: **Write 2** (active low). This signal, in combination with XFER, causes the 8-bit data which is available in the input latch to transfer to the DAC register.

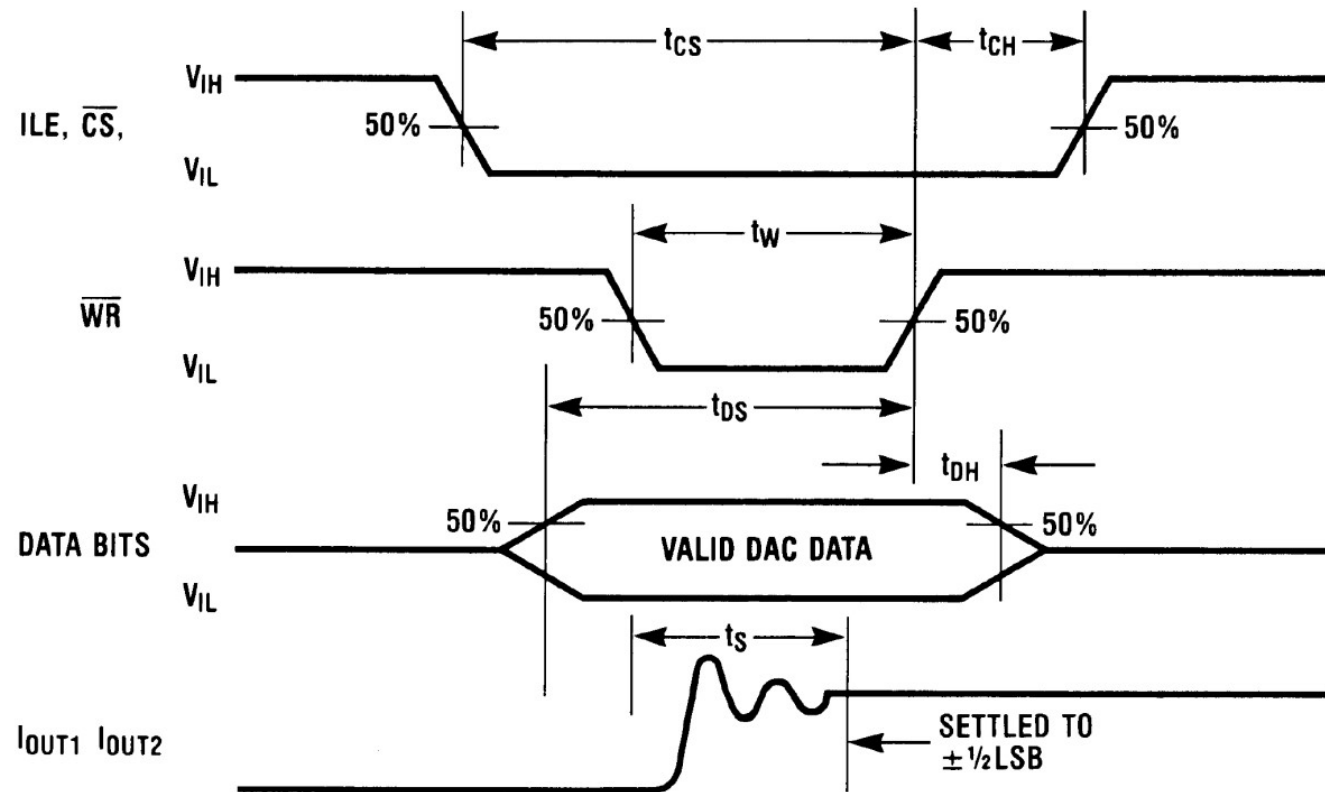$\overline{XFER}$: **Transfer control signal** (active low). The XFER will enable WR2.

$DI_0\text{-}DI_7$: **Digital Inputs.**

IOUT1: DAC Current Output 1 - IOUT2: DAC Current Output 2 : to OPAMP

Rfb: Feedback Resistor for R-2R

VREF: Reference Voltage Input. This input connects an external precision voltage source to the internal R-2R ladder. **VCC - GND**

DAC0830
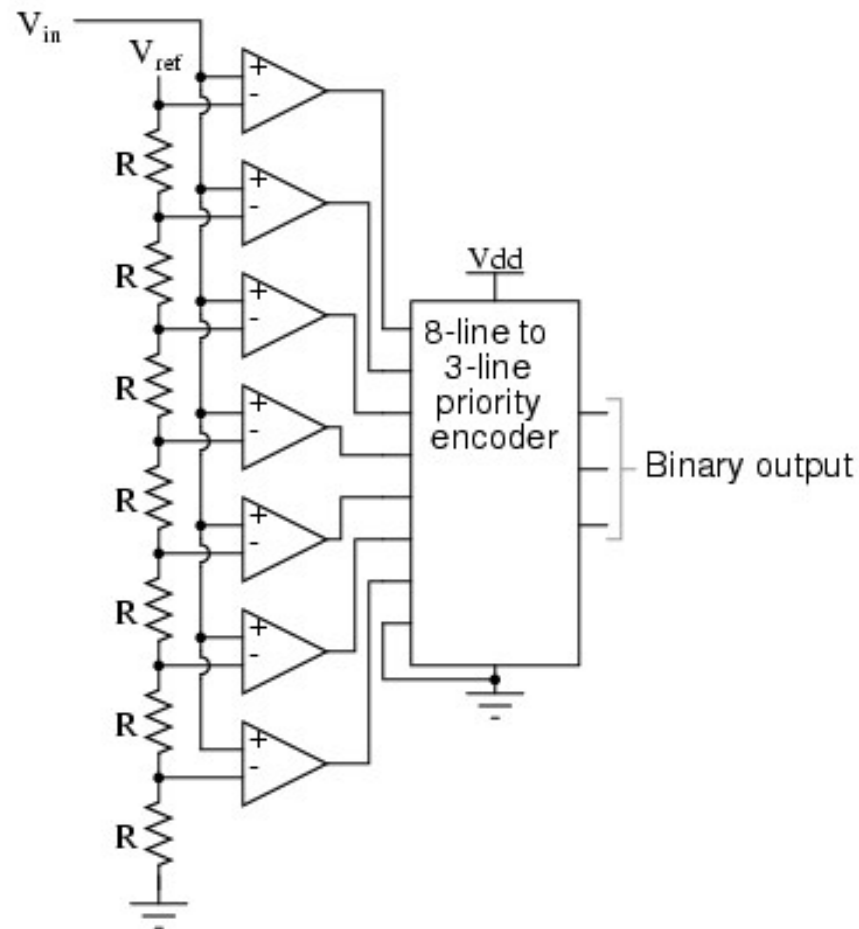
Örnek

MOV DX, 1000H
MOV AL, 00H
TEKRAR:
OUT DX, AL
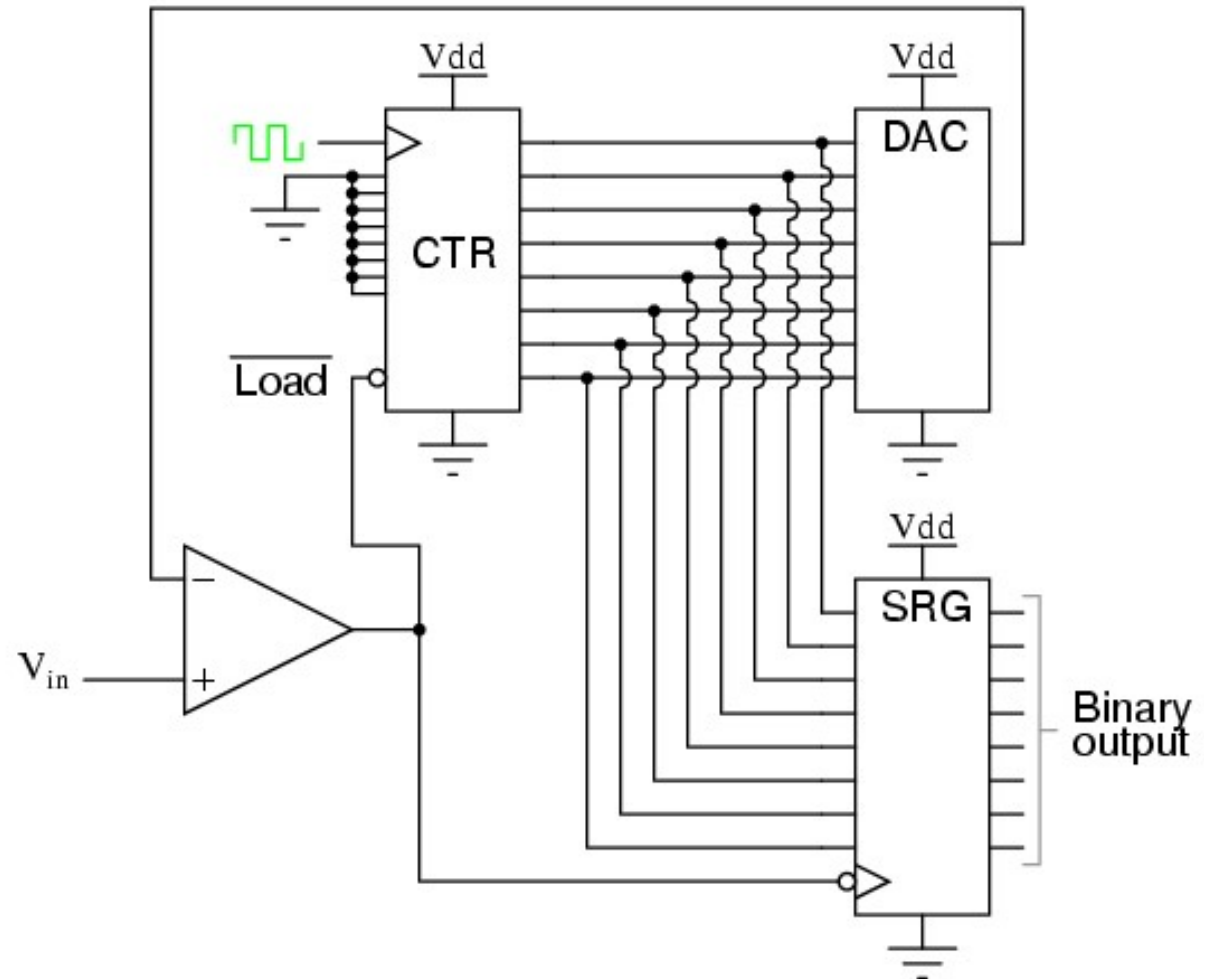CALL DELAY
INC AL
JMP TEKRAR

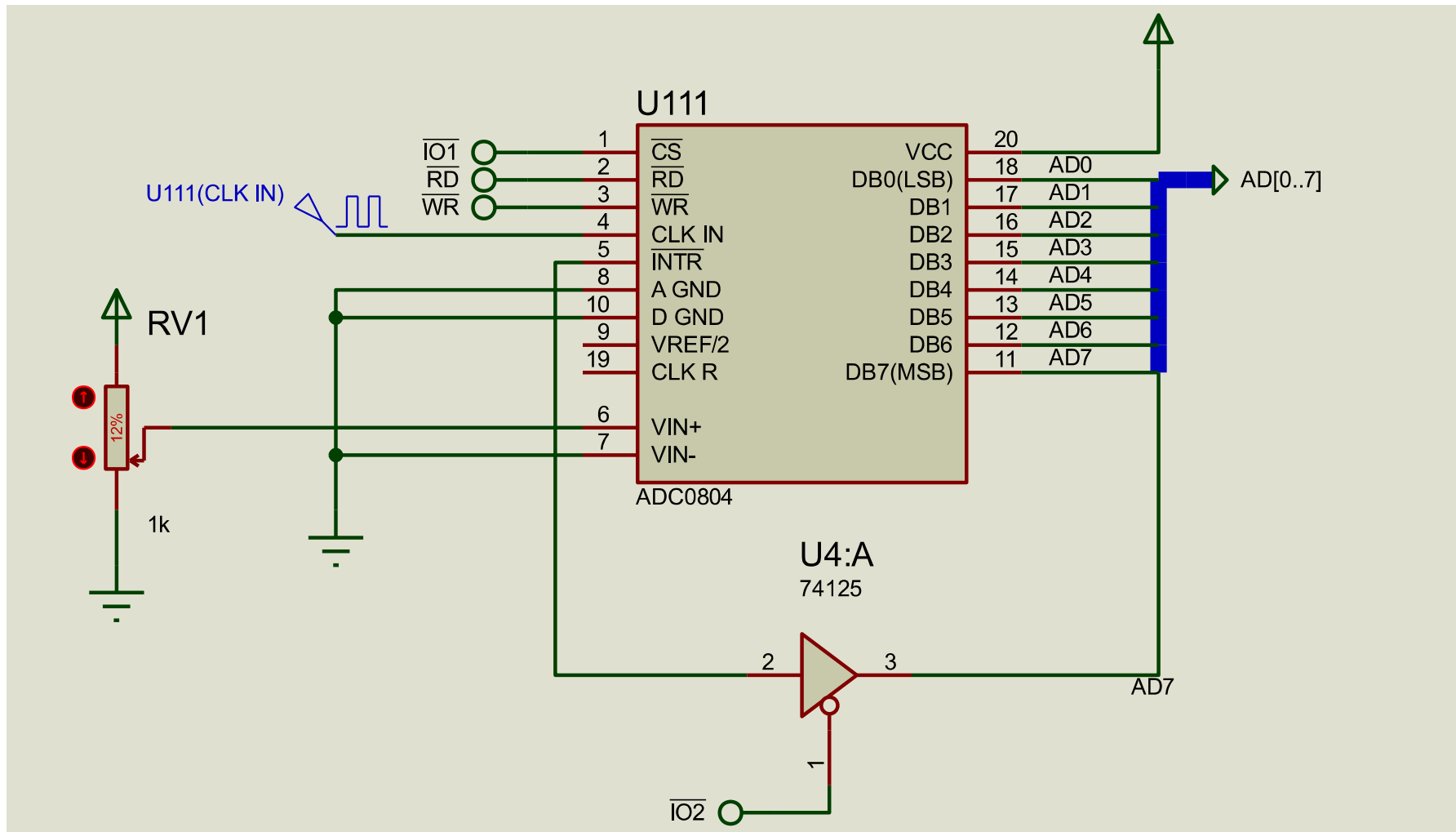# ADC (analog digital converter)

- Parallel ADC

ADC (analog digital converter)

- Ramp converter

ADC0804

$\overline{\text{IO1}}$
$\overline{\text{RD}}$
$\overline{\text{WR}}$

U111(CLK IN)

U111

1	$\overline{\text{CS}}$	VCC	20	
2	$\overline{\text{RD}}$	DB0(LSB)	18	AD0
3	$\overline{\text{WR}}$	DB1	17	AD1
4	CLK IN	DB2	16	AD2
5	$\overline{\text{INTR}}$	DB3	15	AD3
8	A GND	DB4	14	AD4
10	D GND	DB5	13	AD5
9	VREF/2	DB6	12	AD6
19	CLK R	DB7(MSB)	11	AD7
6	VIN+			
7	VIN-			

ADC0804

AD[0..7]

RV1

12%

1k

U4:A

74125

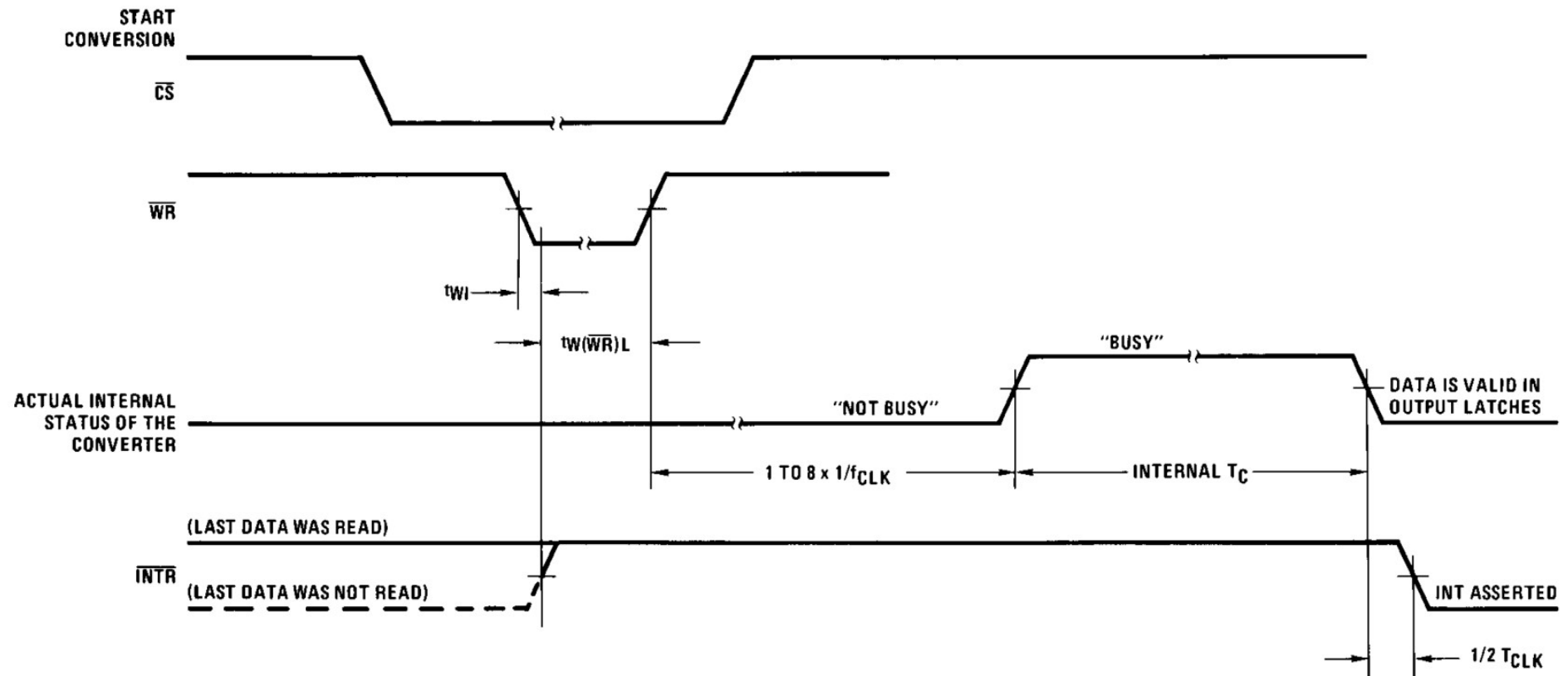2   3

AD7

$\overline{\text{IO2}}$

1

ADC0804

ADC0804

Output Enable and Reset INTR
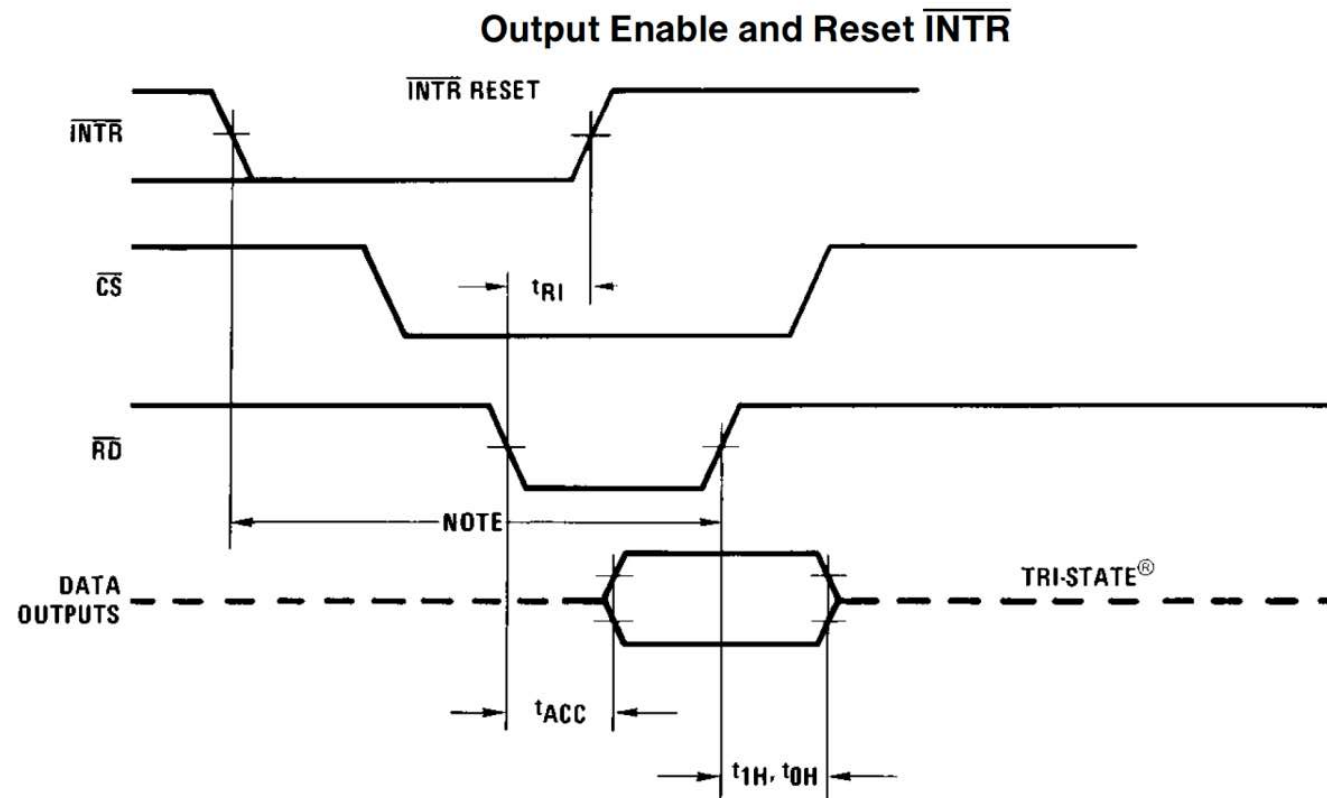
Örnek

TEKRAR:
MOV DX, 0200H
MOV AL, 00H
OUT DX, AL
MOV DX, 0400H
INTR_KONTROL:
IN AL, DX

TEST AL, 80H
JNZ INTR_KONTROL
MOV DX, 0200H
IN AL, DX
CALL DELAY
JMP TEKRAR