

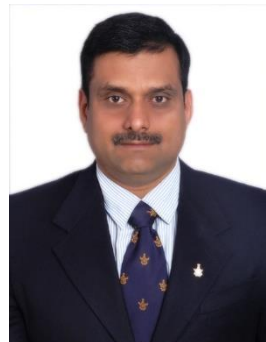


Microprocessors and Interfaces: 2021-22

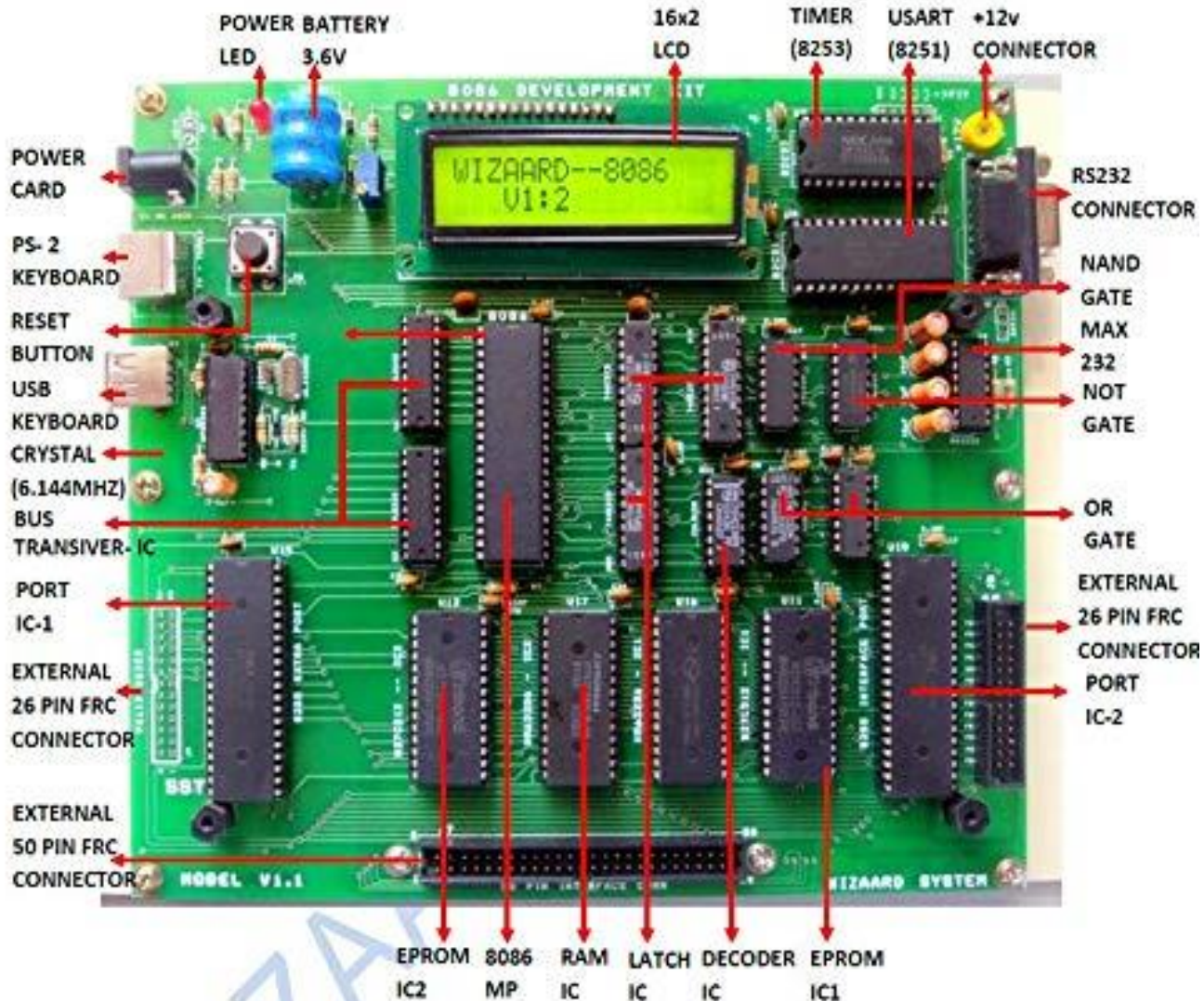
Lab 1

Introduction to 8086 Emulator

By Dr. Sanjay Vidhyadharan



Programming the 8086



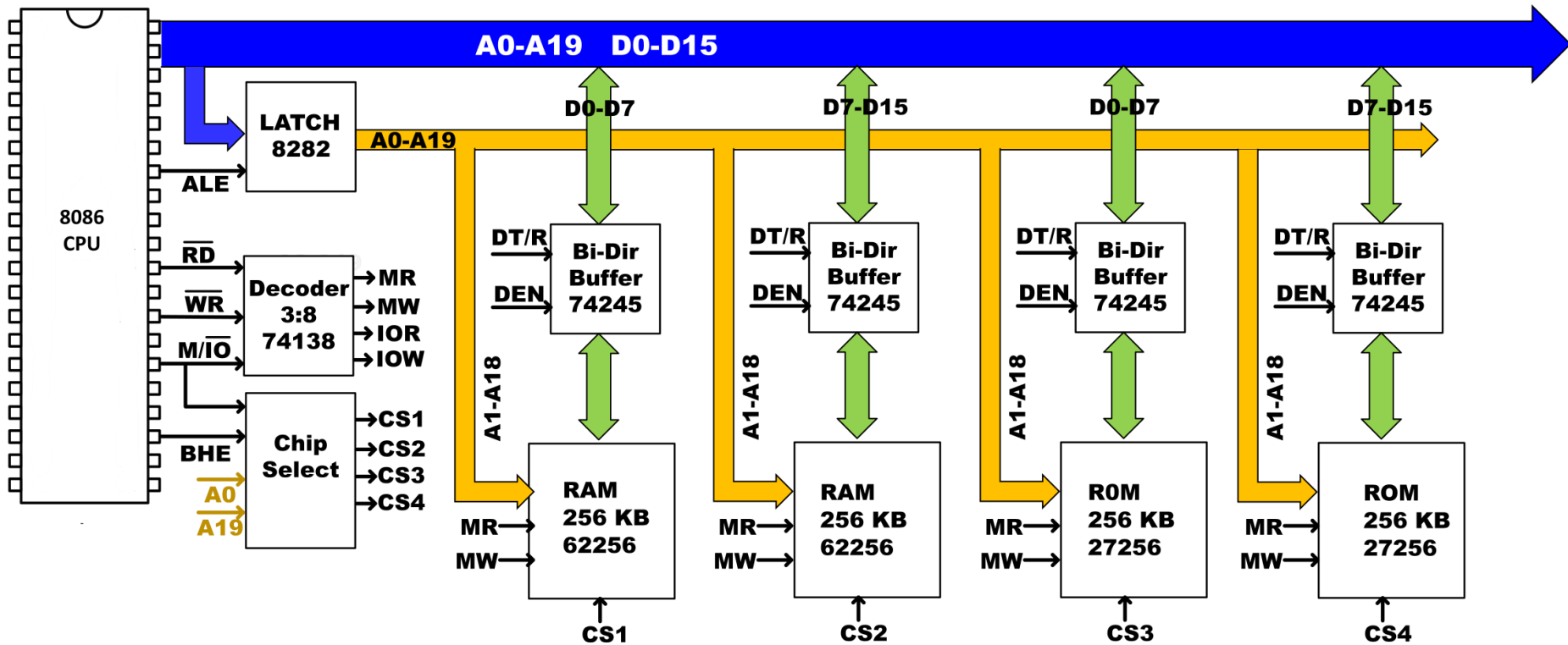
Programming the 8086

- Step 1 : Write Assembly language in text editor and save as .asm file
- Step 2: Use Compilers like MASM (Microsoft Macro Assembler) or TASM (Turbo Assembler) for Syntax Checking, Simulation and generate .obj file (Machine language)
- Step 3: Dump the .obj file to the 8086 Kit using OEM driver software.

8086 Emulator

- Used to write assembly code, check syntax and do simulation.
- Download link:
<https://sanjayvidhyadharan.in/Downloads/Microprocessors/>

8086 Block Diagram



8086 Registers

General Purpose Registers

AX	AH	AL	Accumulator Register
BX	BH	BL	Base Register
CX	CH	CL	Counter Register
DX	DH	DL	Data Register

SI		Source Index Register
DI		Destination Index Register
BP		Base Pointer Register
SP		Stack Pointer Register
IP		Instruction Pointer Register

Segment Registers

CS		Code Segment Register
DS		Data Segment Register
ES		Extra Segment Register
SS		Stack Segment Register

FLAGS					O	D	I	T	S	Z		A	P	C	Flags Register		
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Posizione bit

8086 Block Diagram

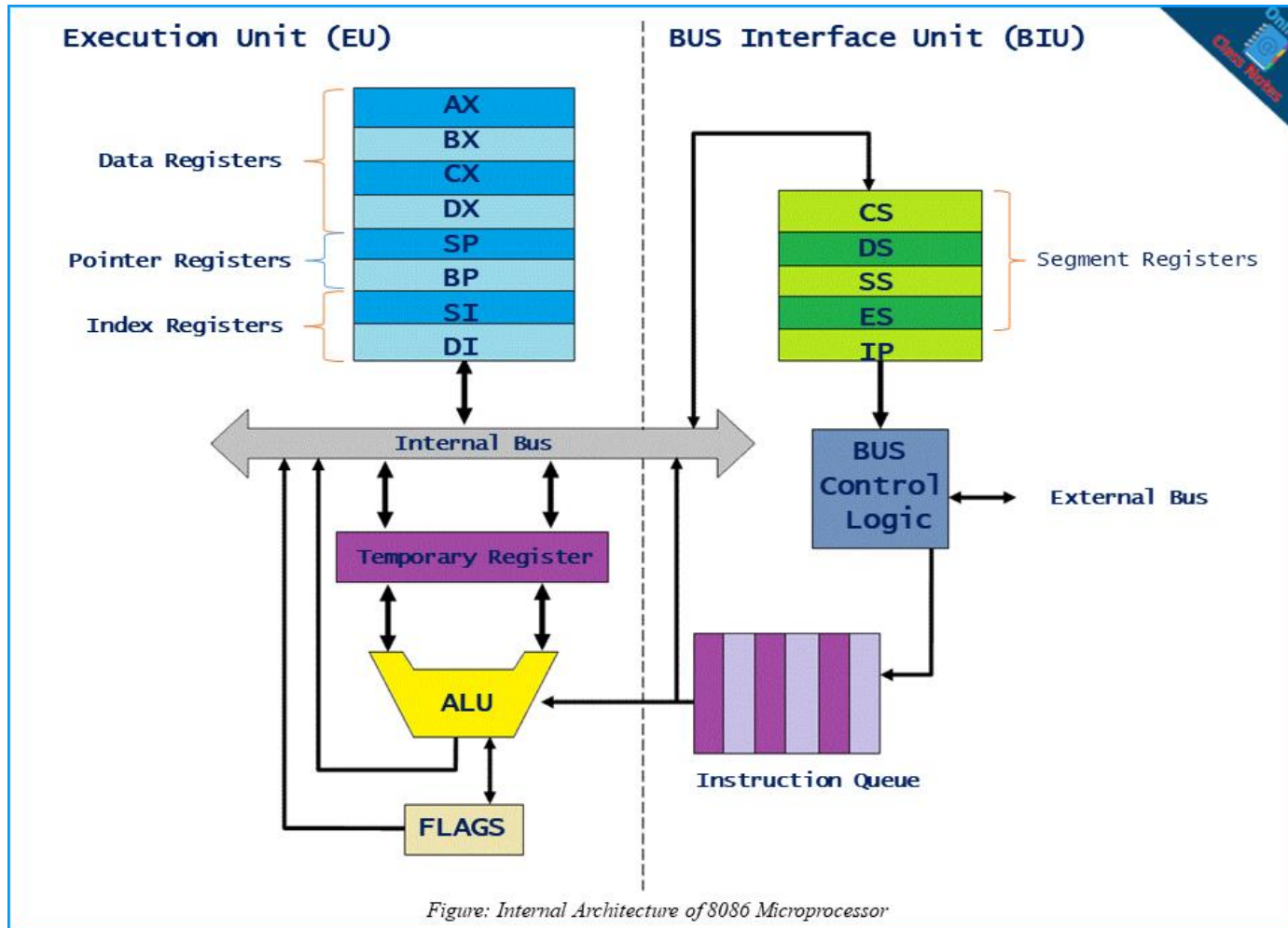


Figure: Internal Architecture of 8086 Microprocessor

Sample Emulator Program

```
Orig 100  
MOV CX,0000H  
MOV AX,1234H  
MOV BX, 1000H  
ADD AX,BX  
HLT  
ret
```


Lab-1 Tasks

PROGRAM -1 (Using Registers and Immediate Data (Result is with carry))

MOV AL, 0F0H ; Load the value to 0F0H

MOV BL, 10H ;Load the value to 10H

ADD AL,BL ; Addition of above two numbers generates carry and carry flag is set CY=1,AL=00H

PROGRAM -2 (Using Registers and Immediate Data (Result is without carry))

MOV AL, 01H ; Load the value to 01H

MOV BL, 02H ;Load the value to 02H

ADD AL,BL ; Addition of above two numbers generates carry and carry flag is set CY=0,AL=03H

Lab-1 Tasks

PROGRAM -3 (Using Registers and Immediate Data)

MOV AL, 01H ; Load the value to 01H

ADD AL,02H ; Addition of AL and immediate data 02 gives result as
CY=0,AL=03H

PROGRAM -4 (Using Registers and Memory)

MOV AL, 01H ; Load the value to 01H

ADD AL,02H ; Addition of AL and immediate data 02 gives result as
CY=0,AL=03H

MOV [1234H],AL ; Physical Address=DS * 10 + 1234H . If DS=0700H then PA =
08234H

PROGRAM -5 (To demonstrate the ADC Instruction)

MOV AL, 0F0H ; Load the value to 0F0H

MOV BL, 10H ;Load the value to 10H

ADD AL,BL ; Addition of above two numbers generates carry and carry flag is set
CY=1,AL=00H

ADC AL,20H ; ADC adds carry flag, contents of AL and 20H.Result=21H (If ADD
instruction is used result will be 20H)



Thankyou