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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

19ECB211 – MICROCONTROLLER PROGRAMMING & INTERFACING

II YEAR IV SEM

UNIT I – PIC MICROCONTROLLER : HISTORY , FEATURES & ARCHITECTURE

TOPIC 3 – WREG Registers in PIC



What is a Register??

- A register is a place inside the PIC that can be written to, read from or both.
- Think of a register as a piece of paper where you can look at and write information on.



WREG Register in PIC

- PIC microcontrollers have many registers for arithmetic and logic operations. Among them is the WREG register.
- In the CPU, registers are used to store information temporarily.
- That information could be a byte of data to be processed, or an address pointing to the data to be fetched.
- The vast majority of PIC registers are 8-bit registers. In the PIC there is only one data type: 8-bit



WREG Register in PIC

- The range goes from the MSB (most significant bit) D7 to the LSB least-significant bit) D0.
- With an 8-bit data type, any data larger than 8 bits must be broken into 8-bit chunks before it is processed.
- The 8-bit WREG register is the most widely used register in the PIC micro controller.
- WREG stands for working register, as there is only one



WREG Register in PIC

- The WREG register is the same as the accumulator in other microprocessors.
- The WREG register is used for all arithmetic and logic instructions
- The context of two simple instructions: MOVE and ADD.



MOVLW Instruction



➤ The MOVLW instruction moves 8-bit data into the WREG register. It has the following format:

MOVLW K ; move literal value K into WREG

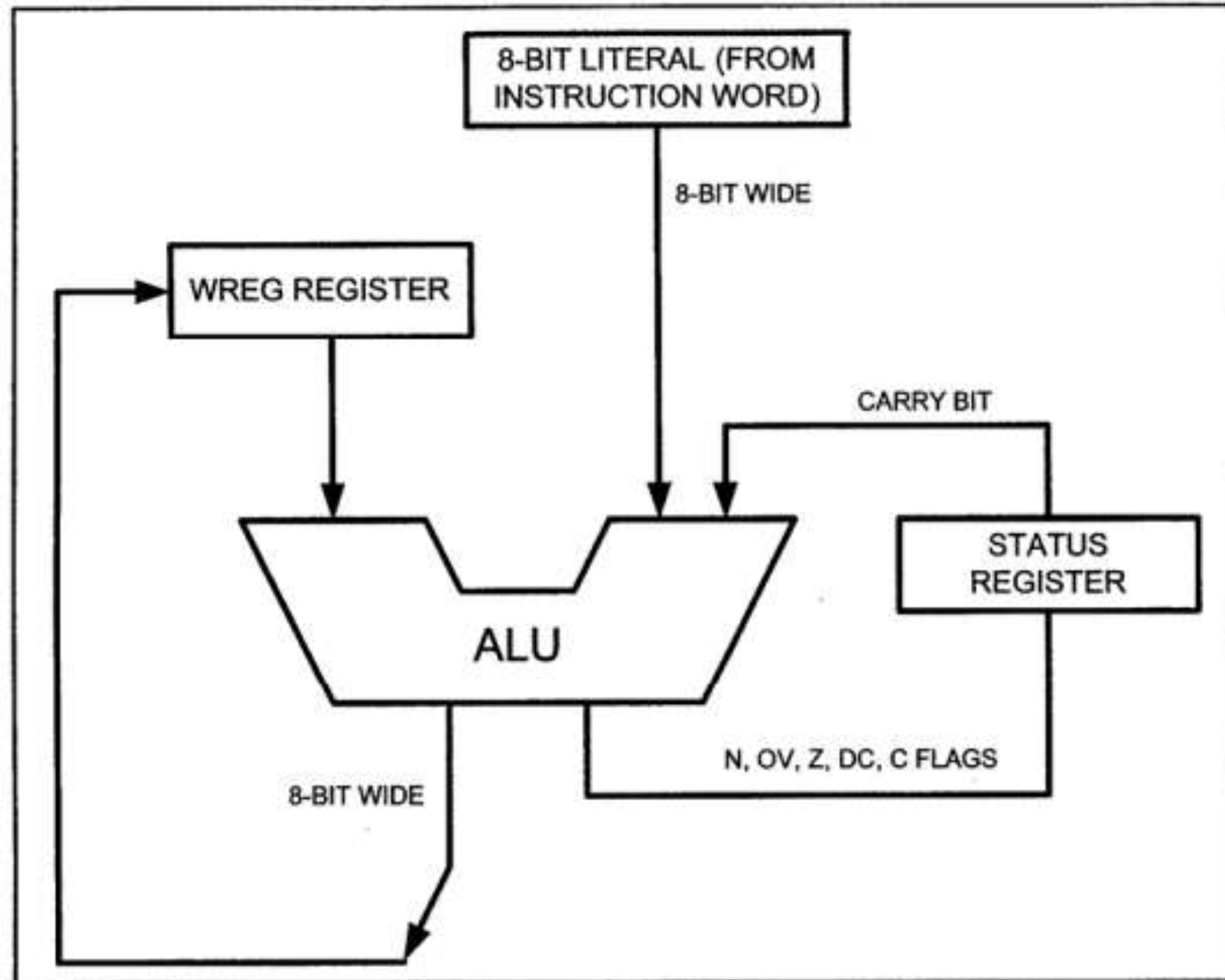
K is an 8-bit value that can range from 0-255 in decimal, or 00-FF in hex. The L stands for literal, which means, literally, a number must be used.

MOVLW 25H ; move value 25H into WREG (WREG = 25H)

MOVLW 15H ; load 15H into WREG (WREG = 15H)



PIC - WREG Register





ADDLW Instruction



➤ The ADDLW instruction has the following format:

ADDLW K ; ADD literal value K to WREG

The ADD instruction tells the CPU to add the literal value K to register WREG and put the result back in the WREG register

➤ To add two numbers such as 25H and 34H, one can do the following:

MOVLW 25H ; load 25H into WREG

ADDLW 34H ; add value 34 to W ($W = W + 34H$)



RISE OF MICROCONTROLLER



➤ The following program will add values 12H, 16H, 31H, and 43H:

MOVLW 12H ; load value 12H into WREG (WREG = 12H)

ADDLW 16H ; add 16 to WREG (WREG = 28H)

ADDLW 11H ; add 11 to WREG (WREG = 39H)

ADDLW 43H ; add 43 to WREG (WREG = 7CH)



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- When programming the WREG register of the PIC microcontroller with a literal value, the following points should be noted:
- Values can be loaded directly into the WREG register.
- There is no need for a preceding pound sign or dollar sign to indicate that a value is an immediate value as is the case with some other microcontrollers.
- If values 0 to F are moved into an 8-bit register such as WREG, the rest of the bits are assumed to be all zeros



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➤ Moving a value larger than 255 (FF in hex) into the WREG register will truncate the upper byte and cause a warning in the .err file.

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MOVLW 7F2H ;ILLEGAL 7F2H > 8 bits (FFH), becomes F2H  
MOVLW 456H ;ILLEGAL 456H > FFH, becomes 56H  
MOVLW 60A5H ;ILLEGAL but becomes A5H
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References



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Thank You