



## LECTURE FIVE

(I/O & Memory Interfacing)

BY:

*M.Sc.: HASAN MUWAFQAQ GHENI*



## **2. Input Output Interfacing 8085 Microprocessor:**

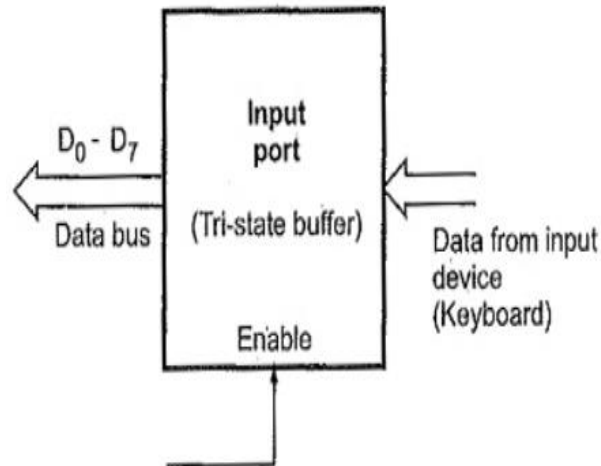
Any application of a microprocessor based system requires the transfer of data between external circuitry to the microprocessor and microprocessor to the external circuitry. User can give information to the microprocessor using keyboard and user can see the result or output information from the microprocessor with the help of display device. The transfer of data between keyboard and microprocessor, and microprocessor and display device is called Input Output Interfacing 8085 Microprocessor or I/O data transfer. This data transfer is done with the help of I/O ports.

### **Input Port:**

It is used to read data from the input device such as keyboard. The simplest form of input port is a buffer. The input device is connected to the microprocessor through buffer as shown in the Figure. This buffer is a tri-state buffer and its output is available only when enable signal is active.

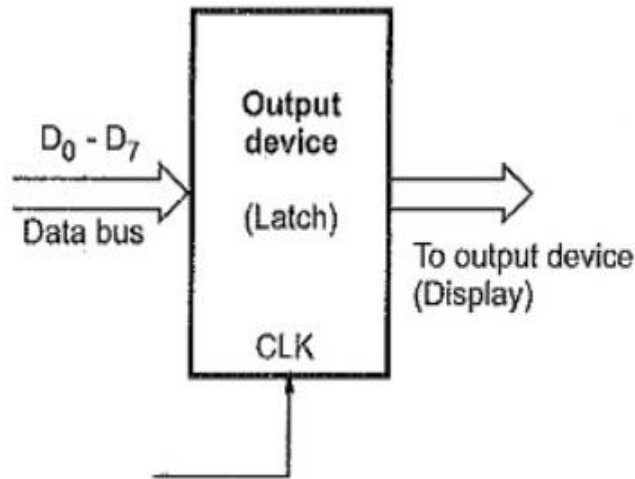


When microprocessor wants to read data from the input device (keyboard), the control signals from the microprocessor activates the buffer by asserting enable input of the buffer. Once the buffer is enabled, data from the input device is available on the data bus. Microprocessor reads this data by initiating read command.



### **Output Port:**

It is used to send data to the output device such as display from the microprocessor. The simplest form of output port is a latch. The output device is connected to the microprocessor through latch as shown in the Figure.



When microprocessor wants to send data to the output device, it puts the data on the data bus and activates the clock signal of the latch, latching the data from the data bus at the output of latch. It is then available at the output of latch for the output device.

**Example.1:** Consider a system in which the full memory space 64kb is utilized for EPROM memory. Interface the EPROM with 8085 processor.

Sol:

- The memory capacity is 64 Kbytes. i.e
- $2^n = 64 \times 1000$  bytes where  $n =$  address lines.
- So,  $n = 16$ .
- In this system the entire 16 address lines of the processor are connected to address input pins of memory IC in order to address the internal locations of memory.



- The chip select (CS) pin of EPROM is permanently tied to logic low (i.e., tied to ground).
- Since the processor is connected to EPROM, the active low RD pin is connected to active low output enable pin of EPROM.
- The range of address for EPROM is 0000H to FFFFH.

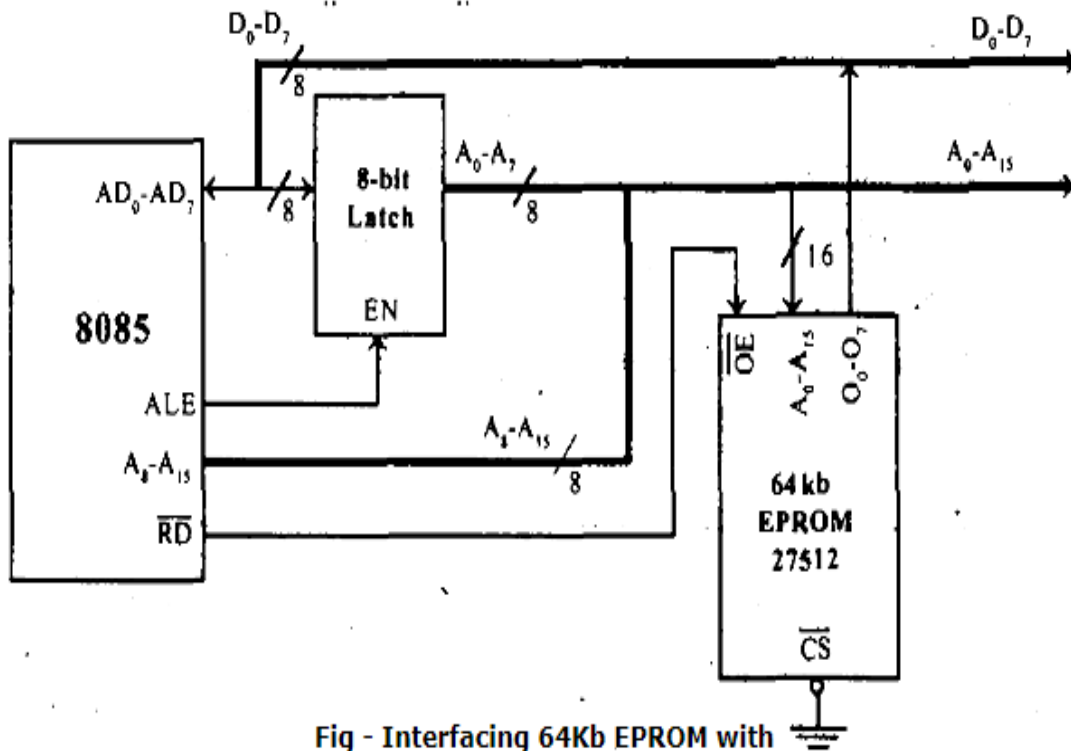


Fig - Interfacing 64Kb EPROM with