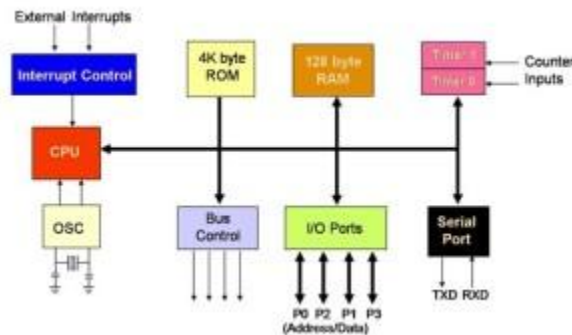


8051 Microcontroller Architecture

Microcontroller 8051 block diagram is shown below. Let's have a closer look on features of 8051 microcontroller design:



Block Diagram of 8051 Microcontroller

CPU (Central Processor Unit):

As you may be familiar that Central Processor Unit or CPU is the mind of any processing machine. It scrutinizes and manages all processes that are carried out in the Microcontroller. User has no power over the functioning of CPU. It interprets program printed in storage space (ROM) and carries out all of them and do the projected duty. CPU manages different types of registers in 8051 microcontroller.

Interrupts:

As the heading put forward, Interrupt is a sub-routine call that reads the Microcontroller's key function or job and helps it to perform some other program which is extra important at that point of time. The characteristic of 8051 Interrupt is extremely constructive as it aids in emergency cases. Interrupts provides us a method to postpone or delay the current process, carry out a sub-routine task and then all over again restart standard program implementation.

The Micro-controller 8051 can be assembled in such a manner that it momentarily stops or break the core program at the happening of interrupt. When sub-routine task is finished then the implementation of core program initiates automatically as usual. There are 5 interrupt supplies in 8051 Microcontroller, two out of five are peripheral interrupts, two are timer interrupts and one is serial port interrupt.

Memory:

Micro-controller needs a program which is a set of commands. This program enlightens Microcontroller to perform precise tasks. These programs need a storage space on which they can be accumulated and interpret by Microcontroller to act upon any specific process. The memory

which is brought into play to accumulate the program of Microcontroller is recognized as Program memory or code memory. In common language it's also known as Read Only Memory or ROM.

Micro-controller also needs a memory to amass data or operands for the short term. The storage space which is employed to momentarily data storage for functioning is acknowledged as Data Memory and we employ Random Access Memory or RAM for this principle reason. Microcontroller 8051 contains code memory or program memory 4K so that it has 4KB Rom and it also comprises of data memory (RAM) of 128 bytes.

Bus:

Fundamentally Bus is a group of wires which functions as a communication canal or mean for the transfer Data. These buses comprise of 8, 16 or more cables. As a result, a bus can bear 8 bits, 16 bits all together. There are two types of buses:

1. **Address Bus:** Microcontroller 8051 consists of 16 bit address bus. It is brought into play to address memory positions. It is also utilized to transmit the address from Central Processing Unit to Memory.
2. **Data Bus:** Microcontroller 8051 comprises of 8 bits data bus. It is employed to carry data.

Oscillator:

As we all make out that Microcontroller is a digital circuit piece of equipment, thus it needs timer for its function. For this function, Microcontroller 8051 consists of an on-chip oscillator which toils as a time source for CPU (Central Processing Unit). As the productivity thumps of oscillator are steady as a result, it facilitates harmonized employment of all pieces of 8051 Microcontroller. Input/output Port: As we are acquainted with that Microcontroller is employed in embedded systems to manage the functions of devices.

Thus to gather it to other machinery, gadgets or peripherals we need I/O (input/output) interfacing ports in Micro-controller. For this function Micro-controller 8051 consists of 4 input/output ports to unite it to other peripherals. Timers/Counters: Micro-controller 8051 is incorporated with two 16 bit counters & timers. The counters are separated into 8 bit registers. The timers are utilized for measuring the intervals, to find out pulse width etc.