Embedded Hardware units and Devices in a system

1. Power Supply

Supply of electricity is necessary to operate any system.

2. Processor

* Core component of any embedded system is its CPU
* Smaller applications require fewer bit processors and large applications require larger bit processors.
* Three different processor types - 8 bit, 16 bit, 32 bit CPU.

Categories of processors available are,

* General purpose processor
* Digital signal processor
* Media processor
* Application specific processor
* Microprocessor } primarily used
* Microcontroller }
* Embedded processor
* Application-specific instruction processor.

3. Timers and Counters

In embedded system, timers are deployed to count the occurence of things and carryout actions at regular intervals.

Timers primary task is to create waveform with specific delays.

4. Memory:

There are several types of system memory

* Internal memory at μc
* RAM at SoC or External RAM
* Internal cache at μc
* External RAM Chips
* ROM / PROM
* Flash / EEPROM

μC itself contains RAM and ROM
(volatile) (Non-volatile)

5. Communication port

These are interfaces through which the System can communicate with other system.

Various interfaces are available

→ UART → CAN → Ethernet
→ Rs-232 → Rs-422 → Rs-485
→ SPI → I2C → USB

Serial port

* Used for Serial Communication
* Data is transferred one bit at a time
* Serial protocols are UART, SPI, SCI, I2C.

Parallel port

* Used for peripheral connections
* Transmits several bits of data simultaneously

In comparison to modern serial ports, the Parallel ports have more datalines and require longer cables and port connectors.

6) Input and Output

* Input may come from user or sensor
* Fixed number of I/O ports can be used on μC under the user's need.