

What is an Embedded System?

- An embedded system is a device that has computer intelligence and is dedicated to performing a single task, or a group of related tasks.
- Embedded systems often perform monitoring & controlling functions such as gathering and reporting sensor readings or controlling motors and switches.
- They are called embedded systems because the program code is an integral part of it or embedded in the device itself.

So What is an Embedded Technology?

- the system in which the code or program is embedded within the system itself - is an embedded system. and the technology that is used to develop such types of system is Embedded Technology.
- thus in all it is process of -
 - Designing Hardware,
 - Code Development,
 - Compilation,
 - Simulation,
 - Burning or Embedding &
 - Execution.

Applications of Embedded Systems?

the following are the applications of embedded system in various domain or areas:-

Communications

- Satellites
- Network Routers
- Switches
- Hubs
- Mobiles...

Computer Peripherals

- Printers
- Scanners
- Keyboards
- Displays
- modems
- Hard disk drives
- CD-ROMs...

Home

- Dishwashers,
- Washing Machines.
- Microwave Ovens
- VCRs
- Televisions
- Stereos
- Cameras
- clocks
- Radios...

Industrial

- Elevator Controls
- Surveillance Systems
- Robots
- Conveyer Belts
- Automatic Packaging,
- CNC Machines
- Access Control Panels...

Instrumentation

- Data Collection
- Oscilloscopes
- Signal Generators
- Power Supplies
- Control systems...

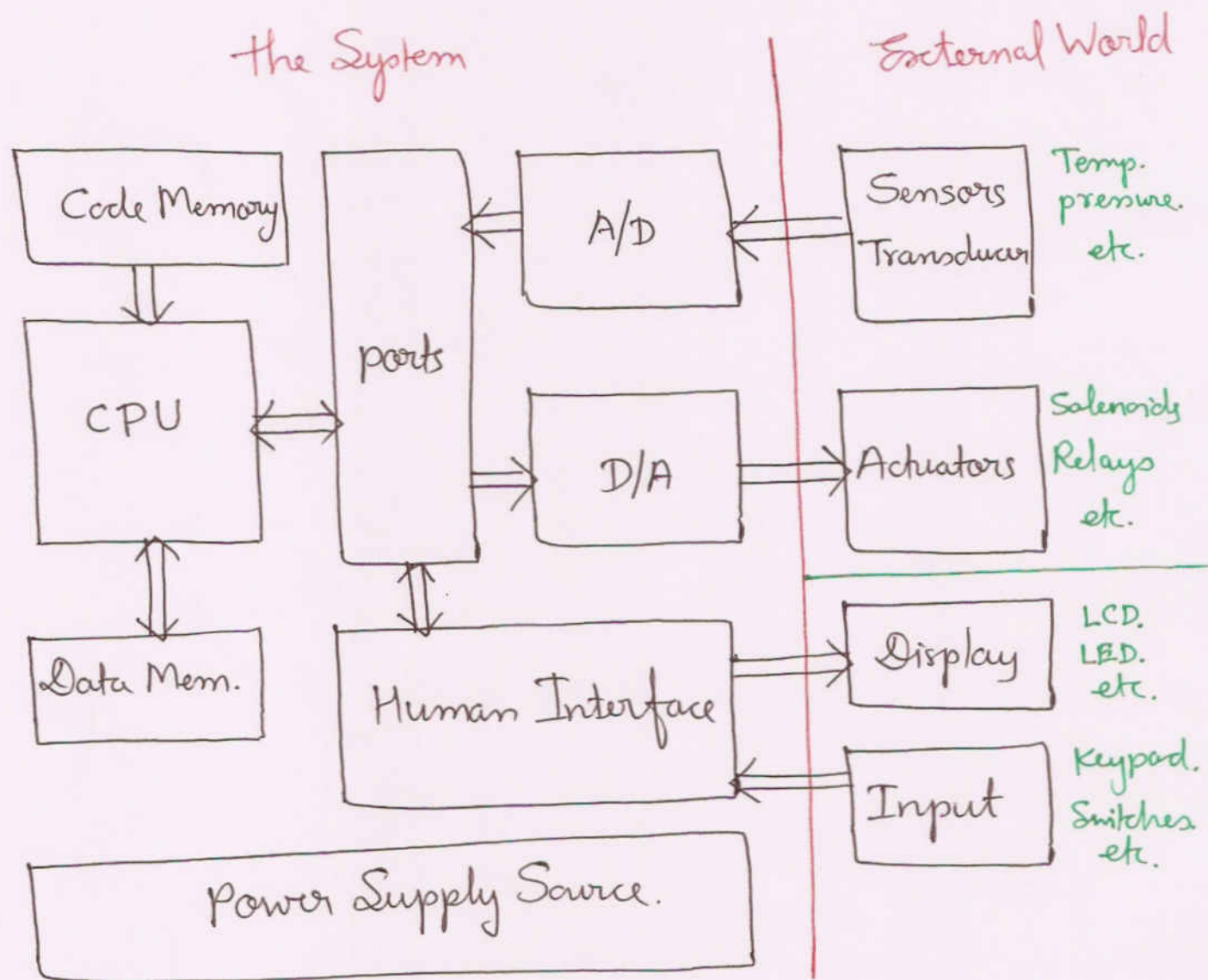
Medical

- X-Ray Machines
- MRI Scanner
- Heart Beat Monitors
- ECG Plotters...

Office

- Fax Machines,
- Copiers,
- Intercom telephones
- Cash Registers...

Generic Structure of Embedded System.



the basic function of most of embedded System is to take input from various sensors (mostly analog) & to process on it for decision making. Finally the response is transferred to external world using actuators for controlling purpose.

thus an embedded system should have minimum System configuration consisting of- CPU, instruction memory (code-mem), Data memory and human Interface unit for external world interface.

The Complete Project Development Process in Embedded System :-

Select Microcontroller

Select the controller depending upon project requirement. One can choose ifrom - AT89C51, P89C51RD2BN or AVR-ATmega32.

Design Circuit

Use EAGLE S/w for circuit & PCB designing. get the pcb printed & solder it.

Develop Program

Develop small test programs & re-integrate for main project code.

Compile for .hex

Compile the code in respective platform like Keil / AVR studio4 to get .hex file.

Burn in MC

burn this file in microcontroller using programmer or I.S.P.

Execute it.

Place the MC in the hardware to get an embedded system.