Testing, Simulation and Debugging Techniques and Tools:

Lesson-4

In-Circuit Emulator
1. Development processes using ICE
Circuit for emulating target system remains independent of a particular targeted system and processor
Using an Emulator or ICE

- A circuit for emulating target system remains independent of a particular targeted system and processor.
- Emulator or ICE provides great flexibility and ease for developing various applications on a single system in place of testing that multiple targeted systems.
An Emulator
An ICE

![Diagram of an In-Circuit Emulator (ICE)](image-url)
Emulator

- Emulates MCU inputs from sensors
- Emulates controlled outputs for the peripheral interfaces/systems
- Emulates target MCU IOs and socket to connect externally MCU
ICE

- Means In-Circuit Emulator
- Interface COM port of a computer
- Emulates target MCU IOs
- ICE socket connects MCU externally
ICE…

- Uses computer developed object files and hex files for the MCU
- Uses debugger at the computer developed files for the MCU application
Nohau Emulator
Difference in Emulator and ICE

- Emulator uses the circuit consisting of the microcontroller or processor itself. The emulator emulates the target system with extended memory and with codes downloading ability during the edit-test-debug cycles.
Emulator and ICE …

- ROM Emulator emulates only a ROM.
- ICE uses another circuit with a card that connects to target processor (or circuit) through a socket.
2. Back support hardware package and ICE Subunits
Back support hardware package and ICE Subunits

- Interface circuit
- Socket
- External Memory
- Emulator-board display unit
- Twenty-keys pad
- Registers
- Connectors
Summary
We learnt

- ICE used for debugging a target system without using the target processor microcontroller
We learnt

- Number of software tools used to develop software for designing an embedded system.

- Sophisticated tools—RTOS, Integrated Development Environment and Prototype development tools needed for integrated development of system software and hardware.
End of Lesson-4 of chapter 14 on In-Circuit Emulator