

# EMBEDDED SYSTEM TRAINING MODULE 1

Duration -25 Days (Theory (1:30 daily) +Practical lab (1:30 daily) = 75 hours)

(8051 Microcontroller/PIC Microcontroller/AVR Microcontroller)

## Introduction of Embedded System

- 1) What do you mean by embedded system?
- 2) Embedded system Development Process?
- 3) Microcontroller Architecture.
- 4) Understanding of Microcontroller Families.
- 5) D/B Microcontroller and Microprocessor
- 6) D/B RISC and CISC Architecture.
- 7) Embedded C Language

## Hardware Component Families

- 1) Resistors
- 2) Capacitors
- 3) Diodes
- 4) Regulators
- 5) Connectors
- 6) Transistor
- 7) Different IC Families
- 8) Soldering Practice
- 9) Practical Hands on Bread Board and PCB Board

## Microcontroller

- 1) Introduction of Microcontroller (8051/PIC/AVR)
- 2) Pin Description
- 3) Memory organization
- 4) Introduction to IDE
- 5) Introduction to Embedded C Programming
- 6) Configuration of I/O Ports and its Registers
- 7) Timer/Counter.

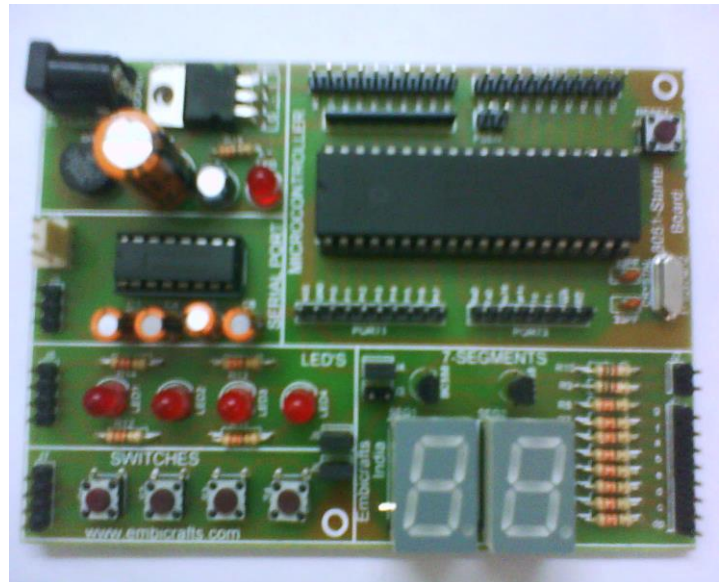
## Interfacing

- 1) LED's
- 2) Switches (polling mode /interrupt mode)
- 3) Seven segment (simplex mode/scrolling mode/TDM mode)
- 4) 16\*2 LCD /20\*4 LCD (number display, char display, special char generation)
- 5) Matrix Keypad
- 6) Motor Driving Dc motor
- 7) Communication Protocol- UART(MAX232)
- 8) Buzzer
- 9) PCB Designing Use Eagle 6.1 Software (Art of Generation and Development using Toner Transfer Method) Drilling, soldering and Testing of Designing Module.

**Projects:** 1 project is completed in the duration of this course.

We will provide the necessary software and hardware:

- 1) Software CD.
- 2) Kit is provided to student it is completed (soldering by student).
- 3) Power Adopter.
- 4) Serial Communication Cable.
- 5) Connecting cable.



## EMBEDDED SYSTEM TRAINING MODULE 2

Duration - 45 Days (Theory (^ 1:30 daily) +Practical lab (1:30 daily) = 150 hours

(8051 Microcontroller/PIC Microcontroller/AVR Microcontroller)

### Introduction of Embedded System

- 1) What do you mean by embedded system?
- 2) Embedded system Development Process?
- 3) Microcontroller Architecture.
- 4) Understanding of Microcontroller Families.
- 5) D/B Microcontroller and Microprocessor.
- 6) D/B RISC and CISC Architecture.
- 7) Embedded C Language

### Hardware Component Families :

- 1) Resistors
- 2) Capacitors
- 3) Diodes
- 4) Regulators
- 5) Connectors
- 6) Transistor
- 7) Different IC Families
- 8) Soldering Practice
- 9) Practical Hands on Breed Board and PCB Board

### Microcontroller :

- 1) Introduction of Microcontroller(8051/PIC/AVR)
- 2) Pin Description
- 3) Memory organization
- 4) Introduction to IDE
- 5) Introduction to Embedded C Programming
- 6) Configuration of I/O Ports and its Registers
- 7) Timer/Counter.

### Interfacing :

- 1) LED's

- 2) Switches (polling mode /interrupt mode)
- 3) Seven segment (simplex mode/scrolling mode/TDM mode)
- 4) 16\*2 LCD /20\*4 LCD(number display, char display, special char generation)
- 5) Matrix Keypad
- 6) Motor Driving DC motor
- 7) Communication Protocol - UART(MAX232)
- 8) Buzzer
- 9) Relay
- 10) IR Sensor
- 11) Stepper Motor use l293D IC
- 12) PIR Sensor
- 13) LDR Sensor
- 14) Communication Protocol-I2C, SPI,
- 15) EEPROM (AT24C08 IC)
- 16) RTC (DS1307 IC)

PCB Designing Using Eagle 6.1 Software (Art of Generation and Development using Toner Transfer Method). Drilling, soldering and Testing of Designing Module.

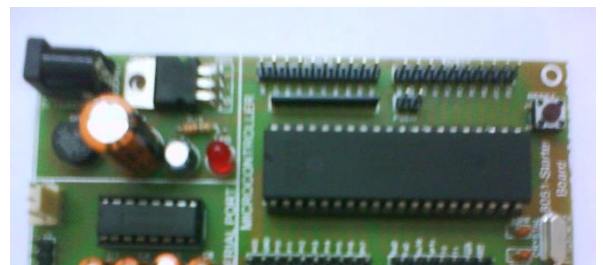
Projects: 1 project is completed in the duration of this courses.

We will provide the necessary software and hardware :

- 1) Software CD.
- 2) Kit is provided to student it is completed (soldering will be done by student).
- 3) Power Adopter.
- 4) Serial Communication Cable.
- 5) Connecting cable.

Optional (any one of these below mentioned Major modules will be used for the project):

- 1) RFID
- 2) GSM
- 3) ZIGBEE



- 4) RF MODULE
- 5) GRAPHICAL LCD
- 6) GPS
- 7) MCP3204 (Analog to Digital Conversion IC)
- 8) DS1621(Thermo state )