Lab Manual

For

Embedded System Design Based on

ARM/Atmel Lab

(MMC- 520)

Prepared By: Dr. SRN Reddy, Associate Professor, CSE &

Mr. VINEET KR SAHU, Assistant Professor, CSE

Computer Science & Engineering Department

Indira Gandhi Delhi Technical University for Women

Kashmere Gate, Delhi-110006

Embedded System Design Based on ARM/Atmel Lab (MMC-520)

EXPERIMENT-1
Introduction to programming tool chain for Embedded Application Development Environment (IDE) i.e. KEIL µversion4 and Flash Magic.

EXPERIMENT-2
Design and develop a re-programmable embedded computer using 8051 architecture. Give its schematic diagram and explain the function of each block.

EXPERIMENT-3
Explain the procedure for Multiple Processor programming with Flash Magic & draw its schematic.

EXPERIMENT-4
Write a program to interface LEDs at Input/ Output Ports, write delay routine and generate 10 different patterns with specified delay.

EXPERIMENT-5
Use of I/O pins for data transfer between two controllers and perform Master and Slave Communication.

EXPERIMENT-6
Write a program to use different Memory Block for different purpose.(e.g. each block for different LED patterns). Use switches for selecting different LED patterns.

EXPERIMENT-7
Write a program to erase a particular memory block (as in experiment no. 5) and re-write with some other LED pattern code. Use switches for selecting different LED patterns.

EXPERIMENT-8
Write a program to use of Timers 0/1 in Timer Mode and generate delay and use this delay to blink LED as per experiment no.3. Also calculate the delay.

EXPERIMENT-9
Write a program to interface seven segment display
a) Display the numerals from 0-9 at regular interval.
b) Display one character of your name at a time at regular interval.

EXPERIMENT-10
Write a program to communicate between PC and Controller using RS232 interface at 9600 baud rate using Window XP hyper-terminal application.

EXPERIMENT-11
Write a program to communicate between two controllers using SPI (Serial Peripheral Interface) and draw its schematic.

EXPERIMENT -12
Write a program to print Hello World/ Your name using Intel Atom board editor and check the output on the terminal.

EXPERIMENT-13
Write a program to display MAC address of Intel Atom Board on the terminal and initialise the serial port.

EXPERIMENT-14
Study the architecture and peripherals of MBED ARM development board and write a program to display various system parameters.

EXPERIMENT-15
Write a program to interface buzzer and LEDs at I/O ports of ARM MBED board.

EXPERIMENT-16
Write a program to interface LCD to ARM board and display moving message.

EXPERIMENT-17
Write a program to generate variable duty cycle of Pulse Width Modulation (PWM) using ARM board. Select duty cycle using 8 switches D/P switch.

EXPERIMENT-18
Minor project based on 8051/ATmeg/ARM/ATOM. Choose a project as per your choice it should include at least five interfaces from following list-

i. External interrupt
ii. Timer/counter
iii. Sensor- motion/IR/Sound/humidity/pressure/Temperature
iv. ADC
v. LCD
vi. 4 X 4 keyboard/ Qwerty Keyboard
vii. RS232 Interface/I2C/SPI
viii. GSM module/ Bluetooth Module
ix. Motor
x. Relay
xi. RTC