



ENT269

Embedded System and Interfacing

Laboratory 6: Smart Home Monitoring System

Name:

Matrix No.:

Laboratory Group:

Date:

Lab Demonstration

Demo		Verification
HyperTerminal		Time :
ThingSpeak		Sign :

OBJECTIVES

1. To develop Smart Home Monitoring System using PIC18.
2. To program the system in C18 programming language.
3. To demonstrate Smart Home Monitoring System in software and hardware application.

EQUIPMENT/COMPONENTS

1. PIC Microcontroller (SK40C) – 1 Unit
2. Temperature Sensor LM35 – 2 Units
3. DC Motor Fan – 1 Unit
4. 5V Relay board – 1 Unit
5. WiFi Module ESP 8266 – 1 Unit

INTRODUCTION

Smart Home Monitoring System is a system with combination of sensors, microcontroller and serial communication to monitor the temperature inside home.

LM35 temperature sensor converts temperature into its proportional analog voltage value. LM35 is three terminal device. Pin number one and three are for 5-volt voltage supply. Pin two is analog voltage output with respect to temperature value. Relation between measured temperature and analog output voltage is:

$$1^{\circ}\text{C} = 10\text{m volt}$$

Hence for every 1 degree increase in temperature there will be a increment of 10m volt in output voltage of LM35 sensor.

PIC18F4580 microcontroller built in ADC (analog to digital converter) is used to measure analog voltage. ADC has been used to read analog voltage. After reading ADC value, using voltage and temperature relationship voltage is converted back into temperature. A conversion factor is used to convert voltage back into temperature. Hyper Terminal is used to display temperature value.

ACTIVITY/TASK

PREPARE a structured program in C language to the tasks given below:

Task

Develop a Smart Home Monitoring System as shown in Figure 1.0. Get the temperature data from channel 0 (RA0) and channel 1 (RA1). External interrupt connected to port RB0 (INT0) is used to TOGGLE the LED at port RD1 and a fan connected to port RD0 is used to monitor the average temperature of the system.

AVERAGE TEMP $\geq 27^\circ\text{C}$: FAN ON

AVERAGE TEMP $\leq 27^\circ\text{C}$: FAN OFF

Simulate the system and display the **TEMP1**, **TEMP2**, **AVERAGE** temperature value and **FAN** status at HyperTerminal. For the hardware application you can choose either to display through **HyperTerminal** or **ThingSpeak** (using WiFi module – ESP 8266).

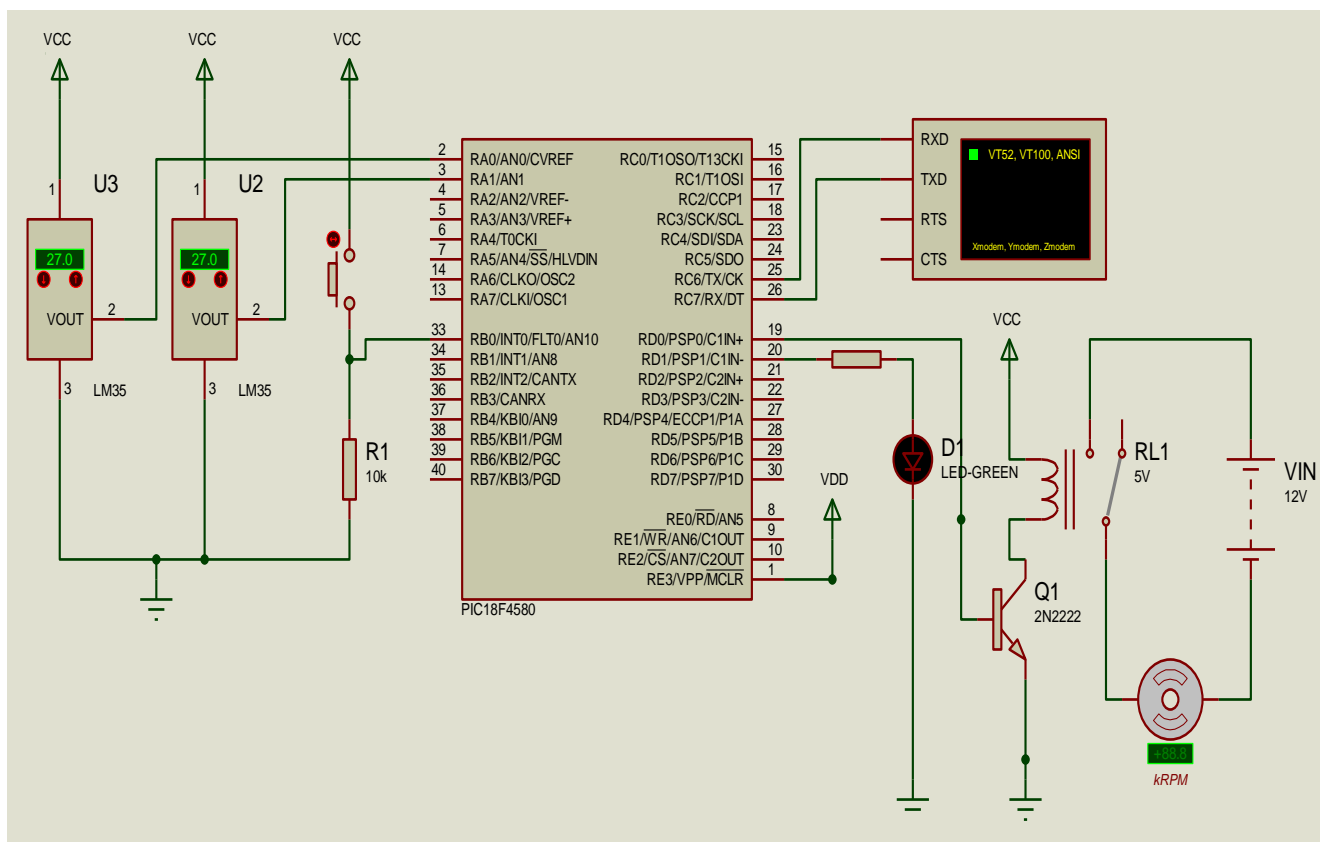


Figure 1.0

PROGRAM CODE:

DISCUSSION:

CONCLUSION: