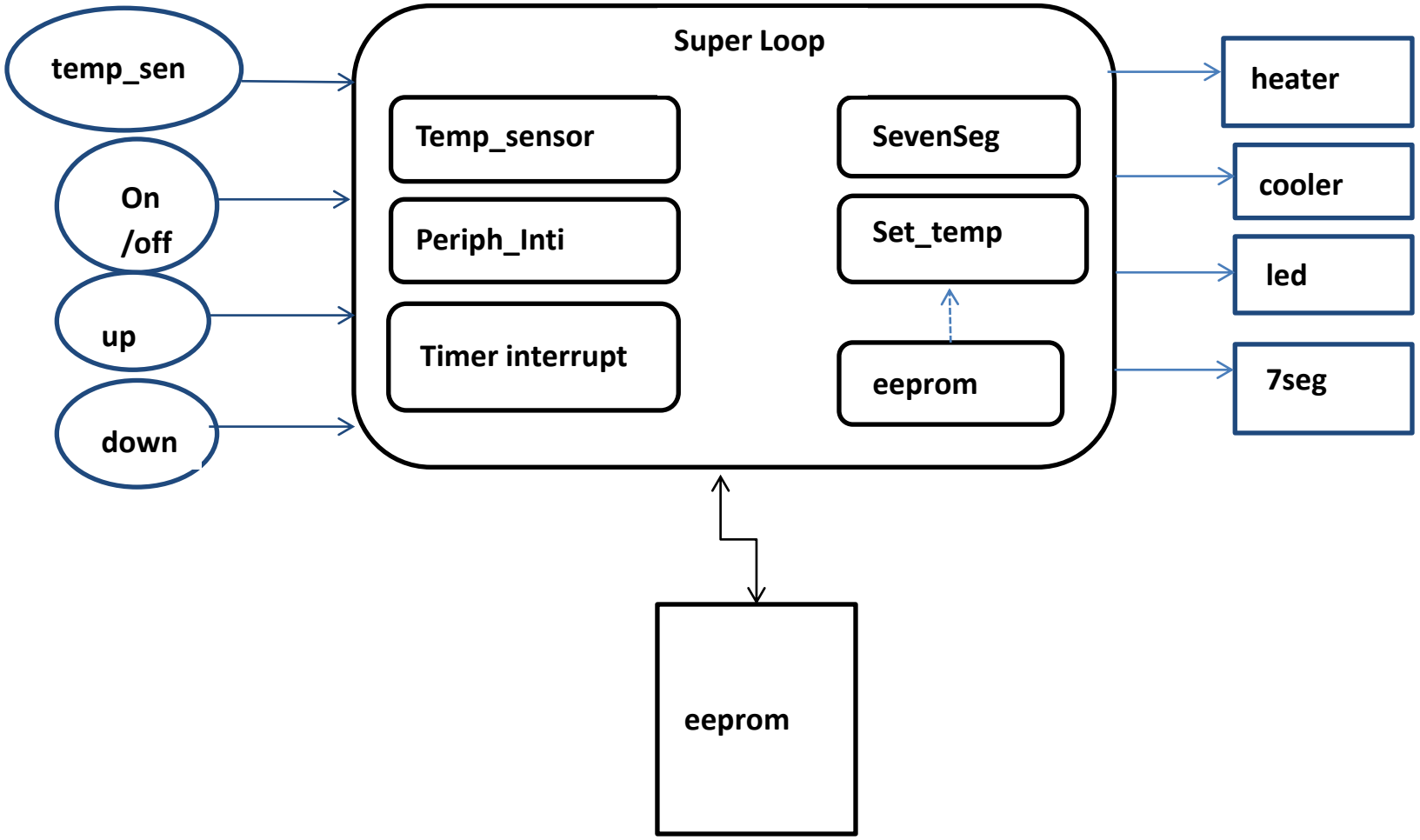
Overview


temp_sen
On
/off
up
down
Super Loop
Temp_sensor
Periph_Inti
Timer interrupt
SevenSeg
Set_temp
eeprom
heater
cooler
led
7seg
eeprom

Software Details

Timer_interrupt
- Timer0_Init
- Enable_Timer0_Interrupt
- Disable_Timer0_Interrupt

Periph_Inti
- DIO_Inti
- HeaterON
- Cooler_ON
- Cooler_Heater_OFF

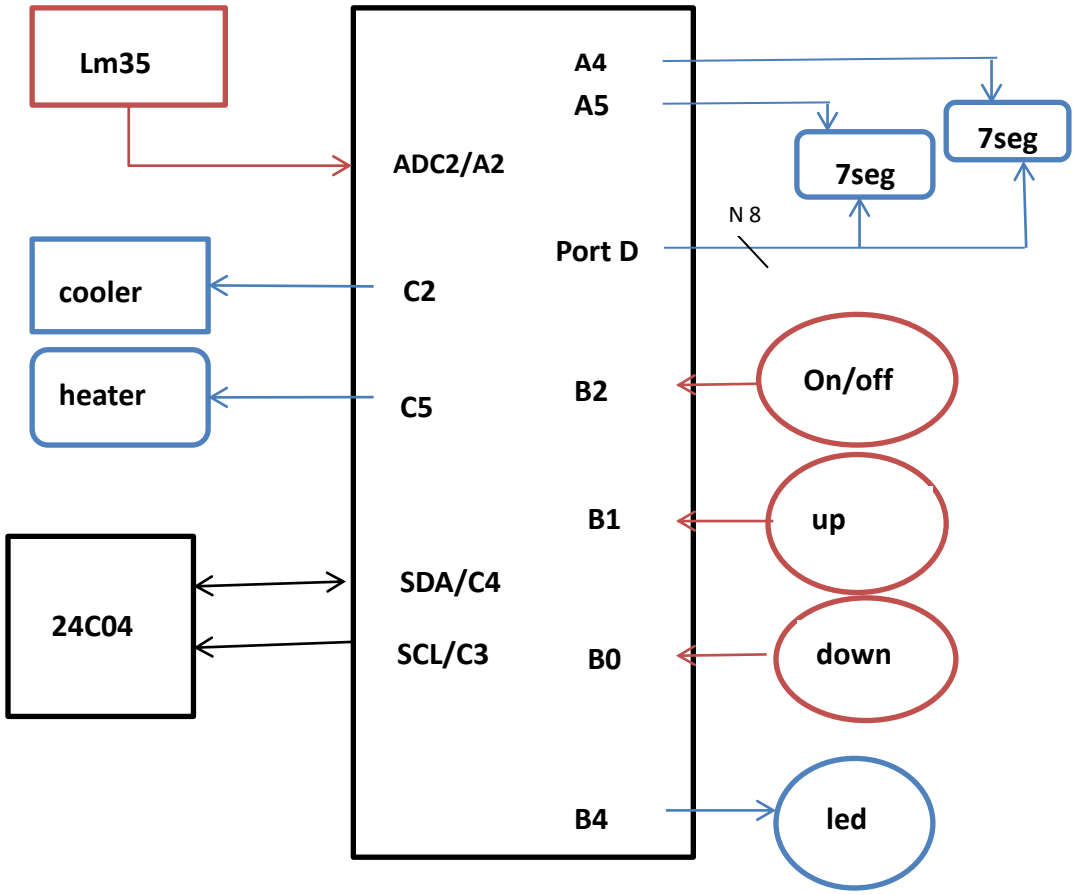
SevenSeg
- Display7s
- SEGMENT_Display_2Digit
- Display_OFF

Temp_sensor
- ADC_Init
- ADC_Read
- ADC_Start_Conv

Set_Temp
- Temp_Inc
- Temp_Dec
- Temp_push
- Calculate_Temp_Avg

E2PROM
- E2PROM_Read
- E2PROM_Write

Hardware diagram



1) crystal oscillator
freq = 20 MHZ.

2) EEPROM has initial value
60 on the address 2

PORTA

A2 : input for ADC2 to read the temperature sensor “ lm35” .

A4 : output Enable for seven segment 1 .

A5 : output Enable for seven segment 2 .

PORTB

B0 : input to read the down button.

B1 : input to read the up button.

B2 : input to read the on/off button.

B4 : output heater led .

PORTC

C2 : output to enable or disable the cooler system .

C5 : output to enable or disable the heater system .

C3 : Shares the clock signal .

C4 : Sends the data to and from between the pic and eeprom “ 24c04” .

PORTD

All pins of port D is output shared between the 2 seven segment to write the data.

Timer0.

The sequence of the code

```
Main(){

… … …

While(1){

   While(heater_state==HEATER_OFF)

          {  … … …  }


   While(heater_state==HEATER_ON) {

        If( … )  { … }


        else{

1.              if( … ){  … }

2.          while((Temp_Setting==Temp_Setting_ON) && … … )

            {   …  …

              … …     }

3.          while(( TempSet_Flag==1 )  &&  … … )

           {   …  …

              … …     }

                                    }    }

                                                 }       }
```

Timer0 interrupt using for :

1. Turn off the setting mode after 5s
2. Flash the 7seg every 1s
3. Read the water temperature every 100ms
4. Flash the heater led every 1s