



ELECTRIC WATER HEATER

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THANK YOU

MATERIALS USED

- XC8 compiler
- MPLAB IDE
- PICSimLab Simulator
- PICSimLab's MPLAB Plugin
- Example project from: <https://github.com/lcgamboa/picsimlab>, so drivers and sample codes can be used for my own reference

STEPS

1. Read the system's requirements carefully and understand it
2. Explore the sample code and data sheet to understand the board's registers, and how to use the drivers in the sample code.
3. Configure your IDE on I6F877A configuration
4. Start implementing the requirements
5. Use the debugging tool and the simulator for bug fixes

TIMERS AND TASKS

- There are five main functions in this project that requires to be done after a certain period of time, so timers were used for this purpose. The functions are:
 1. 7S display
 2. Temperature measurement
 3. Blinking 7S in temperature setting mode
 4. Blinked LED in heater mode
 5. Exiting temperature setting mode

TIMERS AND TASKS

Task	description	Delay required	Timer used
7S display	Updating 7S display	10 ms	TMR2
Measuring temperature	Measuring the temperature using ADC channel 2	100 ms	TMR0
Blinking 7S in temperature setting mode	Toggling 7S display to make it blink	200 ms	TMR0
Blinking LED in heating mode	Toggling LED output to make it blink	200ms	TMR0
Exiting temperature setting mode	Change back to the normal mode after a certain period of time	5 s	TMR1

IMPLEMENTATION DETAILS

- The frequency used is 2MHz
- TMR0 ,TMR1,TMR2 were used to make interrupts after: 100ms, 1s , and 10ms respectively.
- TMR0 were used to measure the temperature every 100ms, also it was used to make the blinking delay for both the 7S and LED by initiating a flag every 200ms by using a counter and toggling their values after the counter value reaches 2
- TMR1 were used to disable the temperature setting mode after completing 5 interrupts without using the UP or DOWN buttons
- TMR2 were used make a delay while displaying the temperature value on the 7S every 10ms

STATE DIAGRAM

