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Project Thermostat

The thermostat project for SysTec could use the Freescale, Microchip, and TI microcontrollers to control the peripherals associated with this venture. The Microchip microcontroller captures touch sensing input and captures timing such as the buttons used in the thermostat to get the desired setpoint temperature. (Staff, 2009) The Freescale microcontroller is used for the wireless communications with the server to upload the data to the cloud, and the TI microcontroller controls the timers, interrupts, LEDs, and sensors. In the CC3220S board these functions are all ran by two microcontrollers one for Wi Fi and one for everything else.

This system would upload data to the cloud every second. This board utilizes the GPIO peripheral that is checking for button inputs every 200ms, which is being used to adjust the setpoint; the I2C peripheral to read the current temperature every 500ms from the heat sensor and compare that to the setpoint to determine if it should turn the heater on or off; and UART peripheral which is being used to simulate the sending of the data to the server every one second. This would be a wi-fi transmission, done over a Freescale microcontroller. (Staff, 2009)

The flash memory on these microcontrollers is used to upload the program and store it. So in the case of the Microchip controller, it will have the code stored that says to check the button input every interval, and the RAM on this chip will update the variable to whether the button was pushed, and to what button was pushed. The Freescale wi-fi controller will have the program with the sever/client program information in the flash memory and will send the updated information that is coming in every second which is updated on the controllers RAM such as the new current temp, setpoint, heat on/off status, and elapsed time. The TI micro controller will have the bulk of the program code in the flash, checking the timers, running the state machines off the ongoing interrupts, several comparisons being made, with many variables being updated in the RAM such as lights going on or off, setpoint being set, new temperatures being read and set, heat statuses updated, and time being updated. These systems work together to make the thermostat function with the flash holding the program even when the power goes off, and the RAM becoming active and loading data when the program is running. (*Different Types of Memory on Microcontroller -RAM, EEPROM, Flash.*, 2022)

References

*Different Types of Memory on Microcontroller -RAM, EEPROM, Flash.* (2022, October 8). Microdigisoft.com. https://microdigisoft.com/different-types-of-memory-on-microcontroller-ram-eeprom-flash/

Staff, D. (Ed.). (2009, April 15). *Freescale, Microchip, TI Roll out Microcontrollers*. Design News. https://www.designnews.com/freescale-microchip-ti-roll-out-microcontrollers-0