Ryan G. Cooper

Professor Morales

CS-350 Module 7 Project Submission Paper

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**SysTec Smart Thermostat**

The goal is to introduce cloud connectivity to the existing thermostat system. This paper will evaluate options from Texas Instruments (TI), Microchip, and Freescale, focusing on three pivotal criteria: peripheral support, Wi-Fi connectivity, and memory adequacy (Flash and RAM).

Starting with TI, the CC3220 Series seems like a good fit for thermostat hardware. The CC3220 Series board supports GPIO, UART, and I2C, which is essential for the thermostat's existing sensors and interfaces. The TI CC3220 has Wi-Fi built into the board which will help support seamless integration to any cloud services. When it comes to memory, the TI CC3220 has 1MB of flash memory and 256KB of RAM. This amount of memory should be adequate for both the firmware and any future updates.

The Microchip PIC32MZ Series also supports GPIO, UART, and I2C communications. For Wi-Fi, the Microchip PIC32MZ microprocessor would need to add the external WINC1500 module. Since an external module would be needed, it will add to the complexity of the program and the hardware of the thermostat system. Lastly, there are variants of the PIC32MZ Series that has up to 2MB of Flash and 512KB of RAM, offering space for code expansion.

The last board that I researched was the Kinetis KW41Z Series also has the necessary peripheral like GPIO, UART, and I2C communications. The Kinetis KW41Z Series is more focused towards Bluetooth but additional Wi-Fi modules can be attached for cloud connectivity. Then, for memory, the Kinetis KW41Z Series is equipped with 512KB Flash and 128KB RAM, which might be limiting for extensive applications.

Overall, the TI CC3220 Series stands out as the best choice for SysTec's cloud-enabled thermostat system. Its integrated Wi-Fi, sufficient memory capacity, and peripheral support make it a balanced and future-proof solution for all IoT and smart home applications.

**References**

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Top of Form

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