Final Project Reflections

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The prototype version of this thermostat worked well with the TI board. We were able to read temperature from the board using I2C, indicate the activation of the hypothetical heating element using GPIO, and simulate sending data with UART2. When considering the next phase beyond prototype, however, there are some additional aspects to consider.

One major consideration for peripheral need in this application is the capability of output. It is imperative that data can be sent to Systec’s server in a consistent and accurate manner. When looking at some of the alternative hardware that Texas Instruments offers, the SimpleLink CC2652P (CC2652P n.d.) comes to mind. This microcontroller makes use of a power amplifier to extend the range within a 2.4GHz wireless application. This could be a way to make data output more efficient within the device. Also, the fact that our working prototype was completed on a TI board makes the future integration with TI even more enticing.

There are other manufacturers to consider that would also provide perfect solutions for the final product. From Microchip, there is a nice 32bit microcontroller called the Atmel AT03198 (Atmel AT03198: Thermostat with touch and wireless ...). This board is designed for thermostat functionality, and comes enabled for Wi-Fi connectivity. It also features a nice LCD touch screen for an added “touch”. It also has an enabled feature where it can operate on extremely low power with full RAM retention, which allows for less compromise to performance and functionality.

With the functionality we have laid out within the prototype board, there is no concern for being above the storage threshold, and the other boards previously mentioned only have more capability within that realm. Given that the source functionality will be able to be stored in flash memory, and RAM will handle any current commands, the Atmel board may be a good consideration with its better capabilities in retaining RAM for longer periods of inactivity and lower power consumption.

References:

* *CC2652P. CC2652P data sheet, product information and support | TI.com. (n.d.).* [*https://www.ti.com/product/CC2652P?bm-verify=AAQAAAAJ\_\_\_\_\_9\_vgD9NkUl52Wij569O4l4gQ4-0P57Fww-twVTqax5oovVsVwMEMHWcJMEqsu0GbrN\_lS-EAPRmvtcC2ANNBtRS6hNwmgnw-E-frTykH4WM4QTTx9jEN061aqGveeVnc1wPU5FOMCtT83BZOhJr5qXeWyyJi\_ix8PgOzeGcyjcVTgZZLKb8XF2TAh8x9OhoeNEn2O\_OrBmLS7UktYZm6yKUg-9PczicUeVIKkETQPrrejEtCyd0bJ8KDmQnyFXRkh2WsqXSWEMX7xNybA*](https://www.ti.com/product/CC2652P?bm-verify=AAQAAAAJ_____9_vgD9NkUl52Wij569O4l4gQ4-0P57Fww-twVTqax5oovVsVwMEMHWcJMEqsu0GbrN_lS-EAPRmvtcC2ANNBtRS6hNwmgnw-E-frTykH4WM4QTTx9jEN061aqGveeVnc1wPU5FOMCtT83BZOhJr5qXeWyyJi_ix8PgOzeGcyjcVTgZZLKb8XF2TAh8x9OhoeNEn2O_OrBmLS7UktYZm6yKUg-9PczicUeVIKkETQPrrejEtCyd0bJ8KDmQnyFXRkh2WsqXSWEMX7xNybA)
* *Atmel AT03198: Thermostat with touch and wireless ... (n.d.). https://ww1.microchip.com/downloads/en/Appnotes/Atmel-42201-Thermostat-with-Touch-and-Wireless-Connectivity-Software-User-Guide\_AP-Note\_AT03198.pdf*