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Emerging Systems and Architecture

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Project Report

SysTec requested a smart thermostat be developed in order to join the growing global smart thermostat market. The prototype was developed using a TI board. The finished item will use peripherals to support required functions. The finished thermostat will connect to the cloud via Wi-Fi. Also, it will utilize Flash and RAM to support the code.

The prototype was developed using a TI board. Other hardware options for this application include Microchip and Freescale. Each of these options will utilize peripherals to carry out functions in a more user-friendly way. These peripherals include a monitor to display the temperature, and a touchpad for users to adjust the temperature setting. TI have touchscreen controllers that would listen for actions on the touchscreen to be processed to display through the touchscreen which would be the monitor and the touchpad. Microchip would require a touch sensor and a monitor connection in order to display and receive input by users via touch. Freescale has touch monitors that could be used for the thermostat.

The thermostat must connect to the cloud via Wi-Fi to send data to SysTec’s server software. The TI board used for the prototype is a cloud-based device and connecting to the cloud is relatively simple. The TI board must be plugged into the computer that has Code Composer Studio installed and that software facilitates the communication between the TI board and the cloud. Microchip follows similar steps but utilizes the Google cloud platform.

The thermostat must also have enough flash and RAM to support the code. Each of the three hardware options have various boards that include various amounts of flash and RAM. The flash memory will be used to hold the memory. This includes the temperature set and the main functions of the code. The RAM completes the calculations and processing needed to continuously monitor the current temperature and adjust as needed when changes to the temperature are made.