Final Project Report

The thermostat supports the peripherals through three different outlined architectures. All three (Texas Instruments, Microchip, and Freescale) architectures support GPIO, I2C UART, and Timer. GPIO is used for controlling the LEDs which indicate the heat status, and reads button pressed to adjust the temperature setpoint. I2C is used to communicate with the temperature sensor and read the current temperature. UART is used to send the temperature, setpoint, and status data to a separate device for monitoring. Finally, the Timer is used to scheduled periodic temperature reading and temperature updates.

The thermostat connects to the cloud through Wi-Fi using a module and following three steps. The first step is configuring and initializing the Wi-Fi module. Next, it is connected to a network. Finally, data such as temperature and status are transmitted to a cloud server at regular intervals.

The TI (Texas Instruments) architectures flash supports the code by providing nonvolatile memory to store firmware. Furthermore, this architecture’s RAM supports the code by offering volatile memory for applications that are currently running. The Microchip architecture flash is also used for storing nonvolatile memory, but it is usually integrated on the microcontroller. Also, this architecture’s RAM is used for temporary storage of data while it is being processed. Finally, the Freescale architectures Flash is used to store the operating systems sand the applications code, and its RAM is also used to actively process data and run the application.