RHIT – ECE230

Winter 2023-2024

MEMO

To: Dr. JianJian Song

From: Tim Ausec, Tuan Tran, and Lucas Tyson

Date: 2/7/2024

Re: Smart Safe Implementation Week 1 Progress Report

Summary of Last Meeting

- Discussed implementing stepper motors to provide delivery functionality
- Would communicate over bluetooth
- Starting implementation for the RTC to log access attempts
- Starting code documentation
- Completed LED blinking functionality

Current Status

- Minimum viable product is complete (without housing).
- Code is yet to be fully documented.
- Working on finalizing the physical design for the safe and its components
- Deciding what material to use for the actual safe
- Working on implementing Bluetooth and RTC logging

Work Done

- Implemented keypad functionality.
- Implemented LED user interface.
- Implemented servo functionality.
- Implemented state machine (main() file).

Current Work

- Integrating MSP432P4111's internal Real Time Clock for logging access attempts
- Integrating Bluetooth module to acquire access attempt log
- Manufacture box.
- Document code.

Final Objectives

- Create a working safe with Bluetooth integration
- Potentially add movement functionality with stepper motors to allow delivery of secured items
- Introduce an RTC to log the time/date of access attempts
- Develop and test our software using the test plan below
- Write our final report and demonstrate the working final project

Test Plan

- Ensure the voltage rails and other power inputs are operating properly
- Measure positive duty cycle of the servo control signal to ensure accurate PWM (within 1% of expected value)
- Measure the duty cycle of the blinking LED, ensure the on time and off time are equal, as well as making sure the duty cycle is accurate to 1% of expected.
- Verify that the keypad works correctly for all keys using the waveform digital signal scope
- Ensure the main() state machine functions in a timely manner (incorrect code entered -> red LED on, keypad code entered correctly -> LED blinking to indicate unlocked, button pressed -> servos opening, and return to original locked state)
- Verify that the bluetooth is working with correct parity and commands are read properly
- Verify that the RTC is logging the correct time/date info for access attempts