System Test Plan

Rev 1.0

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Health-Assist

Introduction

Listed below are the system test plans for the Pill-Matic automated pill dispenser. The sections have been split into software, hardware and firmware test cases, and have been designed for certain requirements found in the functional specification document. All test conditions are under the assumption that the prototype Pill-Matic is working under normal conditions. Power is ON and controller and mobile application is working as expected.

System Test Plan

Software Test Plan

Mobile Application Test Plans:

T-0 Data Transfer	
Procedures: Attempt to access all elevated user features through the Android mobile application while connected through Bluetooth to the Pill-Matic	**Applicable Requirement:** S5.1.1-III, S5.1.2-II, S5.1.4-III, S5.1.5-III
	Expected Results: Controller shall respond correctly to any mobile application request received via Bluetooth and return the designated response signals

Mobile Application Privacy and Safety:

T-1 Lock Screen	
Procedures: Attempt to modify pill schedules or change connection options	**Applicable Requirement:** S5.3.3-II, S5.4.2-III, S5.4.3-III
	Expected Results: Lock Screen prompt should activate and ask users for a password for further access

Hardware Test Plan

Power Modules:

T-2 Power supply and adapter shall maintain voltage and current stability at all times	
Procedures: Maintain steady operation under maximum power constraints including: All motors at maximum chamber loads, LCD screen touch display ON, microcontroller running, Bluetooth connection	**Applicable Requirement:** H2.4.1-III
	Expected Results: All features are working as intended with no significant impact to user experience

Mechanical Modules:

T-3 Dispenser Mechanism	
Procedures: Send a dispense signal either through "immediate dispense" option or as a normal scheduled dispense to the Pill-Matic	**Applicable Requirement:** G2.10.1-III, G2.10.3-III, S3.3.1-III
	Expected Results: Dispensing mechanism shall release the correct amount of pills as tasked from the correct chambers without being obstructed by the physical mechanisms

T-4 Holding Cell Mechanism	
Procedures: Allow break beam sensor to trigger or allow pills to be stored in holding cells for too long during its normal operational period	**Applicable Requirement:** H3.3.1-III, H3.4.7-II
	Expected Results: The holding cell will release any pills in its chamber to the separate discard chamber when prompted

Firmware Test Plan

Raspberry Pi Firmware:

T-5 The firmware recovers from system crashes	
Procedures: 1. Cause a power loss to the system. 2. Cause the execution of a program to segmentation fault 3. Cause an out of index error in a program	**Applicable Requirement:** F4.1.7-III
	Expected Results: The device reboots and comes back online

T-6 Firmware updates time when syncing with android application	
Procedures: Purposefully change android phone time so that the file transferred via Bluetooth has the incorrect time	**Applicable Requirement:** F4.1.4-III
	Expected Results: The Raspberry Pi adopts the time written in the file, instead of its' own system time.

T-7 Firmware loses less than 1 second per day when powered off and less than 100ms per day when powered on	
Procedures: Completely power off Raspberry Pi, record current device time, against internet time, power on in one day, compare time again.	**Applicable Requirement:** F4.1.4-III
	Expected Results: The current device time compared to internet time should differ by at most one second

T-8 The firmware can read from a template file shared from and to a Bluetooth device	
Procedures: Check to ensure that the firmware is able to read configuration information from the file transferred via Bluetooth and that it can write to said file	**Applicable Requirement:** F4.1.5-III, F4.1.6-III
	Expected Results: The firmware can read and write to the template file and adopts its' configuration to match it.

GUI:

T-9 User interface is reasonably fast so it does not interfere with everyday usage	
Procedures: Navigate between all GUI pages	**Applicable Requirement:** F4.5.1-I
	Expected Results: Time to get from page to page is on average less than 1 second

T-10 User interface does not allow user to get stuck in a menu	
Procedures: Navigate between all GUI pages and finally back to the home page	**Applicable Requirement:** F4.5.2-III
	Expected Results: All pages either link to another page or link to home