| ID | Requirement | Use Case | Fulfilled By | Description | Test (TestCases.h) |
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| 0 | The System has a Graphics Users Interface that the user can Interact With | N/A | MainWindow.ui | The GUI provided simulates as closely as possible the alpha_stim from the LCD screen to the button placement | N/A |
| 1 | The system can be turned off or turned on | UC1 | mainwindow & CES | The User can press the power button on the GUI which will show the main screen and initialize the default values | defaultStateTest() resetToDefaultTest() |
| 2 | Therapy starts when clippers are connected. | UC1 | mainwindow & CES | The user can check the earclip checkbox to simulate a connection to the ear lobe and start the therapy session | startPauseTherapyTest() |
| 3 | Continuous Circuit Check. When contact is lost for less than 5 seconds, treatment resumes. | N/A | CES | The CES class has a contactTimer, which starts if a treatment is running and the clips are disconnected. If the clips are connected again before the timer ends, the treatment resumes. Otherwise, the treatment stops. | contactTimerTest() resetToDefaultTest() |
| 4 | The user can select their frequency: 0.5, 77, 100 | UC7:Set Frequency | mainwindow & CES | The user can press the frequency button to cycle through the 3 preset options. The values are stored in an enumeration. Modular arithmetic is used to cycle through the values. | freqButtonPressTest() freqUiTest() |
| 5 | The user can select their waveform: alpha, beta, gamma | UC8:Set Waveform | mainwindow & CES | The user can press the waveform button to cycle through the 3 | waveButtonPressTest() waveUiTest() |

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| | | | | preset options. The values are stored in an enumeration. Modular arithmetic is used to cycle through the values.. | |
| 6 | The user can select their therapy time: 20,40 or 60 minutes | UC2: Set Timer | mainwindow & CES | The user can press the timer button to cycle through the 3 preset options. The values are stored in an enumeration. Modular arithmetic is used to cycle through the values.. | timerButtonPressTest()<br>startTimeUiTest() |
| 7 | Clock display updates when Therapy is running | N/A | mainwindow & mainscreen | When a therapy is running, the CES class has an internal timer running. On each tick, the timer value decreases by 1, and is updated in the UI. | clockUpdateUiTest() |
| 8 | The user select their amperage from 0 to 500 | UC3: Set Current | mainwindow & CES | The user can press the up/down buttons on the GUI to change the current values.The function ensures that no values lesser than 0 or greater than 500 can be set. | ampButtonPressTest()<br>ampUiTest() |
| 9 | 30 minute auto turn off | N/A | CES | The CES class has a timer called idleTimer. This timer is always running when the CES device is turned on, unless a treatment is running. When any button is pressed, idleTimer is set back into its initial value. When the timer ends, the system is turned off. | idleTimerTest() |
| 10 | Battery charge indicator. When the battery is at 5%, CES issues a warning. Turns off at | UC9: Handle Low Battery | CES | The GUI displays the current battery value. When a treatment is running, the battery value | batteryDrainTest()<br>batteryEndTest() |

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| | 2%. | | | decreases by a set value, every second. | |
| 11 | User can save/load a recording with previously used settings. | UC5: Save Recording<br>UC6: Load Recording | mainwindow, CES, recording, loggingwidget | The user can press the record button to save their treatment. When the treatment is done, it is then added to a vector of recordings.<br>The user can press the “recording’s log” button to view their saved recordings. When viewing recordings, the up and down buttons can now be used to traverse the list of recordings. When a recording is selected, the user can then press the “recording’s log” button again to load their values into the CES. | recordingTest()<br>recUiTest()<br>loadRecordingTest() |
| 12 | Current check ensures the current is never over 700 microamps. | UC1: extension | CES | The current value is checked on bootUp and when the current value is changed again. If the value is over the limit of 700 microamps, the system shuts down. | ampOverloadTest()<br>In the GUI: Debugger menu |
| 13 | Lock button functionality. When a button is pressed, all other buttons will not change settings. | UC4: Set Lock<br>UC2,3,7,8: extensions | mainwindow & CES | The user can press the lock button to prevent accidentally changing the values during treatment. Pressing this button changes isLocked, a boolean value stored in the CES class. When true, pressing any other button does not change the set values. | lockUiTest()<br>lockTest() |