

Traceability Matrix

ID	Requirement	Related Use Case	Fulfilled By	Test	Description
1	The application interface contains buttons, display, labels, and combo boxes.	N/A	MainWindow.ui	Run the program in Qt and observe the ui.	Using QT's built in user interface framework, the physical Oasis Pro system was replicated as closely as possible with an additional display. All the buttons are clickable with the mouse. There is a small admin panel with combo boxes control specific elements.
2	The application battery level is dependent on the time and intensity of a session.	N/A	MainWindow, Device, Session	Start a session and observe the graph decrease as the session progresses.	The <i>Device</i> class keeps track of the device's power level, which the <i>MainWindow</i> class uses to update the display. As a session is running, the power level constantly decreases at a rate depending on the intensity for however long the session is.
3	During a session the graph alternates between showing the battery level and the intensity.	Battery Level/Out of Battery (UC8)	MainWindow, Device	Start a session and observe the graph alternate between the battery level and current intensity.	The <i>Device</i> class enters a session state when a session is started which causes the <i>MainWindow</i> class to alternate what the graph is showing between the current battery level and the current intensity every 4 seconds.
4	Sessions only run with an Okay or Excellent electrode connection.	Connection Test (UC5)	MainWindow, Device	Select the "Select a session" option on the display to enter	The <i>Device</i> class keeps track of the current connection status and updates the graph on the

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				the connection test, if you attempt to start a session with the connection set to poor nothing will happen.	<i>MainWindow</i> . The <i>Device</i> class will only change to the session state and start a session if the connection status is not poor.
5	Sessions pause when the electrode connection becomes poor.	Connection Test (UC5)	MainWindow, Device	Start a session then change the electrode connection to poor.	The <i>Device</i> class keeps track of the electrode connection. If the connection changes to poor while a session is running, the <i>Device</i> will revert to the connection test state and pause the session which is reflected by the <i>MainWindow</i> class.
6	Device supports a session intensity range between 0 and 8 inclusive.	Adjusting Intensity (UC9)	MainWindow, Device, Session	Start a session and press the up or down button to adjust the intensity.	The <i>Session</i> class keeps track of the current session intensity. When the up or down button is pressed, the <i>Device</i> class increases or decreases the intensity respectively which is then displayed on the graph by the <i>MainWindow</i> class.
7	Electrode connection is simulated.	Connection Test (UC5)	MainWindow, Device	Select a connection status in the Electrode Connection combo box.	The <i>Device</i> class keeps track of the current electrode connection status. If the <i>Device</i> is in the connection test state, the connection status is displayed in the graph by the <i>MainWindow</i> class.
8	Device supports 4 session groups.	Selecting a Session (UC6)	MainWindow, Device, Session	While selecting a session, press the	The groups are represented as QLabels that are displayed by

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				power button to cycle through the supported groups.	the <i>MainWindow</i> class and used to create the <i>Session</i> object when the confirm button is pressed and the signal to start the session is sent to the <i>Device</i> class.
9	Device supports 8 session types.	Selecting a Session (UC6)	MainWindow, Device, Session	While selecting a session, press the up and down buttons to cycle through the supported types.	The types are represented a QLabels that are displayed by the <i>MainWindow</i> class and used to create the <i>Session</i> object when the confirm button is pressed and the signal to start the session is sent to the <i>Device</i> class.
10	The user can choose to record a session and add to the treatment records for a single user.	Record Session (UC10)	MainWindow, Device, Session, longTermStorage	Hold the confirm button while in the connection test to start the session and add it to the records once it is completed.	When the confirm button is held down to start the session, the <i>MainWindow</i> , the <i>Device</i> turns on recording for the <i>Session</i> . Once the <i>Session</i> is complete, it gets stored in <i>longTermStorage</i> as a JSON file.
11	The user can view the records of previous treatments.	View Recorded Session (UC11)	MainWindow, Device, longTermStorage	Select “View records” from the display.	When the “View records” option is selected, the <i>MainWindow</i> sends a signal to the <i>Device</i> , which enters the records state and retrieves all the records from <i>longTermStorage</i> .

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12	The device simulation can be powered on and off.	Turn On/Off (UC3)	MainWindow, Device	With the battery inserted combo box set to true, hold the power button until the device turns on or off.	When the power button is held for 2 seconds the <i>MainWindow</i> sends a signal to the <i>Device</i> to power it on or off.
13	Intensity of a session can only be changed during a session.	Adjusting Intensity (UC9)	MainWindow, Device	Press the up and down buttons during different states (main menu, selecting session, records).	When the <i>Device</i> is in different states the <i>MainWindow</i> sends different signals for the up and down buttons to select menu items or select a session type. During a session is the only time the <i>MainWindow</i> sends the signal to adjust the intensity.
14	A saved record saves the date, time, group, and type of treatment.	Record Session (UC10)	Device, Session, longTermStorage	N/A	The <i>Session</i> class has attributes for the date, time, group, and type for each session (the group includes the duration of the session, and the type includes the frequency and the CES mode). The <i>Device</i> creates the <i>Session</i> object and the <i>longTermStorage</i> stores the <i>Session</i> once it is complete.
15	The device becomes non-functional when the battery level reaches 0.	Battery Level/Out of Battery (UC8)	MainWindow, Device	Run sessions until the battery level reaches 0 then attempt to turn the device back on.	Once the battery level reaches 0, the <i>Device</i> alerts the <i>MainWindow</i> to turn off the simulator. If the power button is held while the battery is at 0, nothing will happen.

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16	Records are stored in persistent storage.	N/A	longTermStorage	N/A	The <i>longTermStorage</i> class stores all the recorded sessions in a JSON file.
17	User designated session settings are stored in persistent storage.	N/A	longTermStorage	N/A	The settings for user designated sessions are stored as a JSON file by the <i>longTermStorage</i> (Cannot save new user designated sessions without a secondary device).
18	Device enters Soft Off™ at the end of a session then powers off.	Ending a Session (UC7)	MainWindow, Device	Run a session to completion.	Once a currently running session finishes, the <i>MainWindow</i> sends a signal to the device to enter soft off. The <i>MainWindow</i> then updates the display to show the soft off process before powering off.
19	Device enters Soft Off™ when the battery becomes critical then powers off.	Battery Level/Out of Battery (UC8)	MainWindow, Device	Run sessions until the battery level becomes critical mid-session.	If the battery level becomes critical during a currently running session, the <i>MainWindow</i> sends a signal to the device to enter soft off. The <i>MainWindow</i> then updates the display to show the soft off process before powering off.
20	Battery level resets to full when the user sets battery inserted to false then back to true.	Insert Battery (UC2)	MainWindow, Device	Run at least one session to drain some/all of the battery then change the battery inserted combo box to false and back to true.	When the battery is inserted into the <i>Device</i> it is always at 100% power which is then displayed by <i>MainWindow</i> when the device is turned back on. This is to simulate changing to a fresh battery.

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21	The application does not contain memory leaks.	N/A	N/A	Run valgrind to check for memory leaks.	All dynamically allocated memory that the program was designed to allocate is deleted in the appropriate class destructor.