ID	Requirement Description	Related Use Case	Fulfilled By	Test	Design Element Description
1	The application interface contains buttons, display, and icons.	N/A	MainWindow.ui	Run the simulator in QT to observe the UI.	Using QT's built-in user interface framework, the physical OASIS PRO device was replicated. All buttons are clickable with the mouse. The OASIS device UI is displayed alongside an admin panel, which allows for back-end input of battery level, intensity level, connection status and battery details print out. Also, there is the DAVID Session Editor which allows the input settings for user designated sessions.
2	The icons will light up once the device is turned on and will grey out once the device is turned off.	N/A	MainWindow.ui	Run the simulator in QT to observe the UI.	Once the device is turned on by pressing the power button, the icons for session groups, session types, connection status, battery level will lit up. The icons will be greyed out if device is turned off by holding the power button for 5 seconds.
3	The application battery level is dependent on device status (on or off) running time and intensity of the session.	N/A	MainWindow, Battery	Turn on the device, observe the battery graph (consists of 8 levels), or by selecting "TRUE" for the drop-down list of "show battery depletion detail" on the admin panel. Then start a session and observe the battery level. The battery level will decrease as the device turned on, then it will decrease faster as session started and intensity level increases.	The Battery class keeps tracking of the current battery status of the device, which the MainWindow class then use to update its display on UI and on the admin panel. Once the device is turned on, the battery starts depleting at a constant speed. Then once a session started, the battery will deplete at a faster speed (rate of depletion is affected by the intensity level).

4	When a session started, the device displays the time of treatment.	N/A	MainWindow, Timer	Select and start a session to observe the timer (counting down of time remaining) on the display.	MainWindow class contains the QTimer and QElapsedTimer objects, which control the timer countdown and keep track of how long the session has been running. The MainWindow will display the time set for the selected session group and type before started and will display the timer counting down when a session is running.
5	Session time counting down only when the device ear clips are attached to both left and right earlobes	Test the Connection (UC5)	MainWindow	Start a session and observe the timer when the check box for "Left" and "Right" are unclicked, or if the "No Connection" is selected from the dropdown list for the connection test.	The MainWindow class keeps track of whether the device's ear clips are attached to both earlobes. The session will only start (timer will start counting down) if the ear clips are attached to both earlobes and passing the connection testing.
6	Session time pauses (or does not keep counting down) when clips not attached to both earlobes.	Test the Connection (UC5)	MainWindow	Start a session and observe the timer when the check box for "Left" and "Right" are unclicked, or if the "No Connection" is selected from the dropdown list for the connection test.	Implementation here is the opposite of the previous case. The timer will pause if the device is detached to the earlobes.
7	Device supports a intensity level of a therapy in the range [1, 8].	Adjust the Intensity (UC6)	MainWindow, Record	Start a session and change intensity level by clicking either the up or down button.	Intensity level can only be changed via the up and down buttons on the OASIS Pro simulator when a session is running. The intensity level display on the admin panel will be in sync with the simulator. When any change in the intensity level is detected, the MainWindow and record class will store the information and update the MainWindow.
8	Device supports 3 session groups.	Select Session Group (UC3)	MainWindow	Press the power button to navigate device's supported session groups	The MainWindow class stores the information for 3 groups.

9	Device supports 4 session types.	Select Session Type and Start the Session (UC4)	MainWindow	Press the up or down button to navigate device's supported session types	The MainWindow class stores the information for 4 types.
10	The device will run a connection testing before starting a session.	Test the Connection (UC5)	MainWindow	Press the select button after a session is being selected, the connection testing will be triggered.	The connection can be set using the admin panel, and once the user selects to start a session, the connection test will be triggered, and the session will only start if the connection test is passed.
11	The user can add customized sessions using the DAVID Session Editor	Customize Sessions (UC7)	MainWindow	User enters customized settings for the 4 session types under the 3rd group (User Designated Session).	Using the DAVID Session Editor panel alongside the simulator, user can enters session time, select session type and adjust the intensity level for the sessions being customized. Once the settings is saved, user will be able to select the session using the simulator.
12	The user can choose to record a session and add to history of treatment.	Save Sessions (UC8)	MainWindow, Record, DBManager	Start a session, and press save button (either during the session or after a session completed) to save the record to the history of treatments.	By pressing the save button during or after a session finished, user can save the session information (start time, session group, session type, and duration) to a corresponding Record class object and then saved to an external database via the DBManager object in MainWindow.
13	The user can view the history of treatments.	View Saved Sessions (UC9)	MainWindow, Record, DBManager	Given the device is turned on, press the view button to turn on the records viewing display and to view all sessions currently saved to the device.	By pressing the view button, user can see a scrollable list of all the sessions the device has saved since they were last cleared. These records are loaded from database via DBManager into MainWindow.

14	The user can clear the history of treatments.	Clear Saved Sessions (UC10)	MainWindow, Record, DBManager	Given the device is turned on and display for viewing the records are on, press the clear button to clear all sessions currently saved to the device.	User can choose to clear the records in the system (database) by pressing the clear button, if the device is turned on, the view recording display is on, and the database is not empty.
15	The device simulation can be turned on and off, disabling normal device functionality when the device is turned off.	Turn Device On (UC1), Turn Device Off (UC2)	MainWindow	Turn the device on by pressing the power button. Turn the device off by pressing and holding the power button for more than 5 seconds. Press other buttons while the device is off and observe that their functionalities have been disabled.	The power button, when clicked, sends a signal to MainWindow to disable/enable the buttons, lit up/grey out the icons on the simulator.
16	Intensity level of the session is only changeable during a session.	Adjust the Intensity (UC6)	MainWindow	Select and start a session and change the intensity level by clicking either the up or down button. The intensity display on the admin panel should be in sync.	When a session is not running, MainWindow will identify the status of the session, and determines whether the up and down buttons are used to select session types or adjust intensities.
17	A saved record saves the session start date, time, group and type of session, last chosen intensity level, and the duration of the session.	Save Sessions (UC8)	MainWindow, Record, DBManager	N/A	The Record class has attributes for start date, session group, session type, and duration of the sessions. The MainWindow class keeps a collection of Records objects, and they are created. The DBManager will store and retrieve older records from other runs of the simulator as required.
18	The device becomes non-functional when the battery level is below 2 and will power off if battery level reaches 0.	Battery Depletion (UC11)	MainWindow, Battery	Drain the battery level by running a session or set the level using the admin panel. Once the battery level is below the threshold, a session will be stopped. If the level reach to 0, the device will turn off.	When the battery level reaches to 2 and goes below, the Battery class will alert the MainWindow class to stop the session running. If battery completely drained, the device would turn off. If the power on button is pressed while the battery is at 0, the simulator will not turn on.

20	The device will turn off automatically if no action (no button being pressed by user) in a set time (currently set to 30 seconds).	Turn Device Off (UC2)	MainWindow,	If no action, no button pressed on the simulator within 30 seconds, the device will turn off automatically.	MainWindow has a QTimer object to keep track of user's action with the device. When user do not press any button within the set time of 30 seconds, the auto off timer will reach the threshold and notify the MainWindow class to turn off the device.
21	At the start of a session, the timer starts at the session type's designed time counting down to 0:00.	N/A	MainWindow, Timer	Start a session and observe the timer display.	The MainWindow class maintain a QTimer object sessionTimer to counts the time elapsed for a session. Timer class has a function to help print the counting down on the simulator.
22	Records that contain session information are stored in persistent storage.	N/A	DBManager	N/A	The DBManager class is used to create tables, insert/delete, and query data in an external SQLite database.
23	Last intensity level is stored in persistent storage.	N/A	DBManager	Adjust the intensity level during a session and observe the value saved in the record.	The DBManager saves a record which includes the intensity level information and keeps updating to save the latest info if any changes are made.
24	Device simulator is in sync with the admin panel	N/A	MainWindow	Adjust the intensity level during a session or set the intensity level using the DAVID Session Editor, observe the intensity value displayed on the admin panel. Adjust the battery level using the admin panel and observe the battery graph on the simulator.	The MainWindow and Battery classes keep tracks of the latest battery and intensity level, so whenever these levels got changed, either from the simulator or from the admin panel/session editor, the levels will be in sync.