ID	Requirement	Related Use Case/Sequence Diagram	Fulfilled By	Test	Description
1	The application has an interface similar to that of OasisPro with slight modifications. It contains buttons, several display elements. The application simulates electrodes that connect to earlobes as well as multiple microcurrent therapies.	N/A	MainWindow.ui	Run the application in QT and observe the UI	The QT's built-in ui design framework was used to replicate the physical appearance of the OasisPro device with some modifications. All the buttons are clickable with a mouse. To simulate the electrodes (and their connection quality), the OasisPro application is displayed alongside another panel (above this panel) that allows the user to modify the battery level and simulate the connection of the electrodes to the earlobes. The battery level can be monitored/modified through the QDoubleSpinBox. The battery also displays when the device is turned on displays initially and subsequently periodically during running of the session on the bar graph. The buttons work as per instructions except the group button with the label "T" that is used instead of the power button to change between groups. To simulate the various display icons, Qlabel was implemented. Making the icon interactive was achieved through setting stylesheets.
2	Battery is displayed on bar graph when the device is turned on.	UC1/Power On	MainWindow.ui	Set a battery level in the dialogue box and turn the device on.	Once the device is turned on (power button is pressed), a function called changePowerStatus() is called (connected to the button through signals and slots of QT framework). This function, in turn, calls the displayBatteryLevel() function which lights the appropriate

					number of elements in the bar graph to display the battery.
3	The application battery level is dependent on time, intensity (during running of the session) and contact status of the electrodes.	N/A	MainWindow.ui	Select a therapy and adjust intensity and adjust connection. Observe that battery drain varies depending on therapy, intensity and contact status	Once the device is turned on, a timer will start which will call a function termed drainBattery() in the MainWindow every second. The function will determine the drain rate based on the current state of the device (as per requirements) and update the battery attribute of the device accordingly. This function will also make a decision when to display the battery on the bar graph.
4	The power button turns the device on/off	UC1/UC2 Power On/Power Off	MainWindow.ui	Input a battery level above 0 and press the power button to turn on. Press again to turn off	The useTimer() function handles the running of a session. This function is called every second trough the use of Qt Timer. When the desired time of a session is reached (20s, or 45s), useTimer() calls another function (recordTherapy()) which checks if a Boolean attribute called isRecording is true (note: isRecording can be set to true/ false by startRecording() function which is connected to the record button). If the isREcording is set to false, the session is not recorded, and all the attributes (such as intensity, sessionStatus, elapsed time, etc.) are reset. Otherwise, a a Qstring is build describing the details of the ran session. This message is then displayed in a QListWidget.
5	The device records the session type, duration and intensity if the user presses the record button prior to the end of a session.	UC4/Save Intensity	MainWindow.ui QTimer QString QListWidget	Turn on the application. Go through the groups (pressing the “T” button) and sessions (pressing up/down arrow buttons) then	The useTimer() function handles the running of a session. This function is called every second trough the use of Qt Timer. When the desired time of a session is reached (20s, or 45s), useTimer() calls another

				press the select button to run the session for the selected time/group. Press the record button (note record button can be pressed anytime and so it is not necessary to press it after starting a session). Observe the recording screen.	function (recordTherapy()) which checks if a Boolean attribute called isRecording is true (note: isRecording can be set to true/ false by startRecording() function which is connected to the record button). If the isRecording is set to false, the session is not recorded, and all the attributes (such as intensity, sessionStatus, elapsed time, etc.) are reset. Otherwise, a a Qstring is build describing the details of the ran session. This message is then displayed in a QListWidget.
6	Battery flashes when low	NA	MainWindow.ui	Set a battery level below 20%. Turn on the device and observe the battery UI	The drainBattery() function will automatically blink the battery graph when battery falls below 20%. Between 20% and 10% two bars will blink on the graph. Between 10% and 0% one bar will blink on the graph.
7	The button with “T” symbol changes between the three available groups (20s, 45, and user designed). The ui displays the selection.	NA	MainWindow.ui	Turn on the application, press the button marked “T” to cycle through the available groups.	The button marked with the “T” symbol is connected to a function called selectGroup() in the MainWindow class through the use of Qt’s signals and slots mechanism. Every time this button is pressed, the function changes an attribute called currentGroup. The function makes it so that attribute can only hold values between 0 and 2 (0 = 20s, 1 = 45s and 2 = user designed). The function then calls another function called displayGroup() which changes the stylesheet of the corresponding label based on the currentGroup attribute.
8	The up/down buttons change between the four available groups (“ALPHA”, “DELTA”, “THETA” and “MET”). The ui displays the selection.	UC3/Select Session	MainWindow.ui	Turn on the application, press the up/down button to cycle through the available sessions.	The up/down buttons are connected to functions called upArrowButtonOperations() and downArrowButtonOperations() respectively in the MainWindow

					class through the use of Qt's signals and slots mechanism. Every time these buttons are pressed, the function checks the status of a Boolean attribute called sessionStatus (1 = session selected, 0 = not selected). If the sessioStatus is 0 the functions change an attribute called currentSession. The functions make it so that attribute can only hold values between 0 and 3 (0 = "ALPHA", 1 = "DELTA", 2 = "THETA" and 3 = "MET"). The function then calls another functions then call displaySession() which changes the stylesheet of the corresponding label representing the session based on the currentSession attribute.
9	During the running of a particular session, the up/down buttons change the intensity at which the treatment is administer (intensity can hold values between 1-8).	UC3/Select Session	MainWindow.ui	Turn on the application, select/run a session. Once the session is running press the up/down arrow buttons to change the intensity.	The up/down buttons are connected to functions called upArrowButtonOperations() and downArrowButtonOperations() respectively in the MainWindow class through the use of Qt's signals and slots mechanism. Every time these buttons are pressed, the function checks the status of a Boolean attribute called sessionStatus (1 = session selected, 0 = not selected). If the sessioStatus is 1 (session is selected) and the electrodes are connected the functions change an attribute called intensity. The functions make it so that attribute can only hold values between 1 and 8 (these are the only intensity levels available for the device) The function then calls another functions then call displayIntensity() which changes the stylesheet of the corresponding labels to represent the intensity on the

					bar graph of devices' display. Once a session is over buttons can no longer change intensity (since the sessionStatus attribute becomes 0).
10	The select button selects/starts a session if electrodes connected properly.	UC3/Select Session	MainWindow.ui	Turn on the application. Go through the groups (pressing the "T" button) and sessions (pressing up/down arrow buttons) then press the select button to run the session for the selected time/group. Observe that session on icon lights up.	The power button is connected to a function called selectButtonOperations() in the MainWindow class. Every time this button is pressed, the function checks the Boolean sessionStatus. If it is false, the function sets it to true and start a QTimer for a session. The function also loads the preferredIntensity attribute from the session and sets the intensity to it. The timer calls the useTimer() function every second which handles the running of the selected session.
11	The select button saves the current intensity as preferred intensity for the current (running) session.	UC5/Save Intensity	MainWindow.ui Session QTimer	Turn on the device and run a session. Change the intensity until the desired intensity is achieved. Press the select button to save the intensity. Turn off the device and turn it back on. Select the previous session and run it. The intensity saved during the previous session will be loaded for the current running session.	The power button is connected to a function called selectButtonOperations() in the MainWindow class. Every time this button is pressed, the function checks the Boolean sessionStatus. If it is true, the function retrieves the appropriate session from the Qlist holding the four sessions of the device and sets their preferedIntensity attribute to the current value of the intensity attribute.
12	The device checks the status of the electrodes (connection test) and displays the results (display as per manual) every time a session is selected for running. If there is no connection the session does not run.	UC3/Select Session	MainWindow.ui QTimer	Turn on the application. Go through the groups (pressing the "T" button) and sessions (pressing up/down arrow buttons) then press the select	The power button is connected to a function called selectButtonOperations() in the MainWindow class. Every time this button is pressed, the function checks the Boolean sessionStatus. If it is false, the function calls

				button to run the session for the selected time/group.	displayConnectionTestResult(). This function checks an integer attribute called currentConnection (0 = “no connection”, 1 = “okay connection”, 2 = “excellent connection”) and lights the appropriate number of elements in the bar graph to display the connection status. The function also uses this attribute to make a decision whether to run the session or not. The currentConnection attribute is also linked to the QComboBox through updateCurrentConnection(int) function which allows to update the attribute when a user selects a particular connection from the QBox. The displayConnectionTestResult() function implements a Qt singleshot timer to display the connection status as per manual (for example flashing bar graph labels and turning off the connection status display after some time has elapsed).
13	The running session is paused if the electrodes are disconnected and resumes once reconnected	UC3/Select Session	MainWindow.ui QTimer	Turn on the application. Go through the groups (pressing the “T” button) and sessions (pressing up/down arrow buttons) then press the select button to run the session for the selected time/group. Through the QComboBox select the “no connection” option. Observe, then reselect either “okay connection” or	When the session is selected to run, a timer is started which is connected to a function called useTimer(). This function is called every second. The useTimer() function keeps track of attribute called elapsedTime (tracks the time since a session is started). The useTimer() function keeps track of currentConnection attribute. If the currentConnection is set to 0 (“no connection”), the function does not update the elapsedTime attribute and returns. This essentially pauses the session at the time the electrodes were disconnected.

				"excellent connection"	
14	Intensity level is displayed on the bar graph for a short period of time every time intensity is changed during the running of a session (current intensity level flashes on the appropriate bar graph icon).	NA	MainWindow.ui	Turn on the application. Go through the groups (pressing the "T" button) and sessions (pressing up/down arrow buttons) then press the select button to run the session for the selected time/group. During the running of the session change the intensity level of the session using the up/down arrow buttons and observe the bar graph.	Every time up/down arrow buttons are pressed during the running of a particular session the upArrowButtonOperations()/ downArrowButtonOperations() functions call the displayIntensity()function which changes the stylesheet of the corresponding labels to represent the intensity on the bar graph of devices' display. The flashing of the current intensity label (and the turning off of the overall intensity display after some time is achieved with the help of a singleshot Qt timer).
15	"Session on" icon turns on when a session is running and turns off when the session is not running. This is the animation implementation as described in the manual (modified)	NA	MainWindow.ui	Follow the previously described steps to run a session. Observe the icon turn on. Wait for a session to end or end it early (either by disconnecting the electrodes or pressing the power button). Observe the icon turn off.	A function called displaySessionOnStatus() checks the value of a Boolean sessionStatus attribute and turns on/off the icon accordingly. displaySessionOnStatus() is called from the useTimer which handles the running of sessions for the device.
16	Turning off the device during a session (running of a session) while recording is on records and displays the session on the QListWidget.	UC2/Power Off	MainWindow.ui QTimer	Follow the previously described steps to run a session. Turn on the recording. Turn the device off in the middle of a session. Observe the recorded session details on the QListWidget.	The power button is connected through the signals and slots to a function called changePowerStatus() in the MainWindow. This function has a check for the Boolean sessionStatus attribute. If it is true (i.e a session is selected/running), it calls the recordTherapy() function before turning off the device. recordTheraphy() handles the

					logging of the session details to the QListWidget.