

Traceability Matrix

ID	Requirement	Related Use Case	Fulfilled By	Test	Description
1	The application interface contains buttons	N/A	MainWindow.ui	Run the application in Qt and observe the UI	The device interface was designed using QT's interface editor and widgets
2	The application displays the remaining session time when a session is started	N/A	MainWindow	Run the application and power it on. Select a group and a session, and confirm treatment. Observe the ui	When a session is confirmed, the MainWindow's session timer is started by beginSession with an interval of 1 second. This timer is connected to the updateTimer function. which calculates the remaining time and updates the label in an "hour:minute:second" format
3	The user can select a group with the power button	UC3: Selecting a Session	MainWindow, group	Run the application and power it on. Once powered on, press the power button to select a group	When the device is on and there isn't currently a running session, pressing the power button sends a signal to mainWindow and executes the selectGroup function, which cycles through the QVector containing the groups
4	The user can select a session with the up and down intensity buttons	UC3: Selecting a Session	MainWindow, session	Run the application and power it on. Once powered on, press the up or down intensity button to select a session	The up and down intensity buttons send a signal to mainWindow and executes selectUpSession/selectDownSession, which update the currently selected session index, referring to a specific index in a QVector containing all sessions.
5	The user can confirm a treatment with the check button	UC3: Selecting a Session	MainWindow	Select a group and a session and make sure that the earclips are connected. Then, press the check mark button.	When the check button is pressed , the confirmTreatment slot executes, confirming the group and session, and checking the connection before beginning a session
6	The user can view a history of recent treatments even when the device is restarted		MainWindow, dbmanager, recording	Save a session and observe the UI.	
7	The user can dampen their ears	N/A	MainWindow	Click the "Damp Ears" button and	When the damp ear button is pressed, MainWindow's

				observe the colour of the box beside it	earsWet variable is changed and the ui updates the status box to either green if changed to damp and red otherwise
8	The user can connect ear clips	N/A	MainWindow	Click the “Connect Earclips” button and observe the colour of the box beside it	When the damp ear button is pressed, MainWindow’s earClipsConnected variable is changed and the ui updates the status box to either green if changed to damp and red otherwise
9	The application can only confirm a session when a group and session type are selected	UC3: Selecting a Session	MainWindow, session, group	Attempt to press the check mark without selecting a group and/or a session	When the check button is pressed, MainWindow checks to see if its currSelectedGrp and currSelectedSess are valid. If not, it prints out a warning without confirming the session. Otherwise, the session is confirmed and corresponding UI signals are blocked.
10	The user can only save a session when there is a running session	N/A	MainWindow, dbmanager, session, group, recording	Attempt to press the Save Treatment button without a running session	MainWindow blocks the save treatment button’s signals until a session is begun. If pressed without a running session, no signal is sent and nothing happens.
11	The application displays connection strength when a session is begun	UC5: Connection Test	MainWindow	Start a session and observe the connectivity scale	When a session is begun, MainWindow checks for damp ears and connected earclips. The connectivity scale on the UI is update accordingly
12	During a session, there should be no connection when earclips are not connected	UC5: Connection Test	MainWindow	Start a session and press the “Connect Earclips” to disconnect it. Observe the connectivity scale	When a session is begun, MainWindow checks if earclips are connected. If they are not, then the connectivity scale lights up levels 7 and 8 in red.
13	During a session, there should be okay connection when the earclips are connected and the ears are not damp	UC5: Connection Test	MainWindow	Start a session with connected earclips but not damp ears. Observe the connectivity scale	When a session is begun, MainWindow checks if earclips are connected and if ears are damp. If the ears are not damp, then the connectivity scale lights up levels 4-6 in yellow.
14	During a session, there should be strong	UC5: Connection Test	MainWindow	Start a session with connected earclips	When a session is begun, MainWindow checks if

	connection when the earclips are connected and the ears are damp			and damp ears. Observe the connectivity scale	earclips are connected and if ears are damp. If the earclips are connected and the ears are damp, then the connectivity scale lights up levels 1-3 in green.
15	The running session is ended if the device is turned off and the timer should be reset	UC2: Turning The Device Off	MainWindow	Start a session and hold the power button while the session is still running. Observe the remaining time	When the the device is powered off, it runs the endSession function, which sets the currTimerCount to 0 and updates the UI remaining time label to 0:0:0
16	A session can be saved in a database	N/A	MainWindow, dbmanager, session, group, recording	Start a session and press the Save Treatment button	When the “save treatment” button is pressed, a recording object containing the current intensity, group and session is created and inserted into the database and added to recordingList
17	The ui should display battery power level	N/A	MainWindow	Run the application and observe the Battery label	Ui displays and updates a progress bar which shows the current battery level of the system
18	The device turns off when battery power level reaches 0	UC2: Turning The Device Off	MainWindow	Run the application and use it until the battery reaches 0	Once the progress bar reaches a level of 0, it shuts down the device
19	The device supports 4 session types	UC3: Selecting a Session	MainWindow, session	Power on the device and press the power button without a running session to make sure you can only cycle through 4 options	MainWindow keeps an array named sessionList which contains the 4 sessions displayed on the UI. Selection cycles through this list
20	The device supports 3 groups	UC3: Selecting a Session	MainWindow, group	Power on the device and press the up and down intensity without a running session to make sure you can only cycle through 3 options	MainWindow keeps an array named groupList which contains the 4 sessions displayed on the UI. Selection cycles through this list and MainWindow sets the corresponding time to either 20,45 or user-designated.
21	The device should send a warning when battery power is low	N/A	MainWindow	Use the device until it is low on battery	The UI displays the battery level in red instead of blue when the power is at a low level