COMP3004 Final Project Traceability Matrix

ID	Requirement	Related use cases	Fulfilled by	Test	Description
1	The device has a screen, 8 buttons, and LEDs.	N/A	MainWindow	Launch the program and look at the interface	There are visible buttons and LEDs, and a screen that turns on. The buttons are clickable with the mouse, the screen is populated once turned on, and LEDs turn on contextually.
2	The battery level depletes over time during therapy. When empty, machine remains off until charged.	2. Turn Device On, 4. Turn Device Off, 8. User Starts a Session	MainWindow, Profile	Start session, watch battery deplete. Let battery deplete to 0, ensure device turns off and does not turn on until recharged.	The battery display shows the current level rounded to integers, changing colours as it depletes. It discharges during session, and if it runs out, it will turn off the device. If the battery is empty, the device will not turn on until it is recharged at least partially. The battery level is stored in the profile.
3	A light on the machine indicates an active pulse reading	3. Active Pulse Reading Indicator	MainWindow	Observe state of purple LED when enabling and disabling skin connection	The LED should be lit when there is an active skin connection and the pulse is being read. It should be unlit when pulse reading is not in progress.
4	The 8 buttons on the device are functioning, and non-power buttons disable when device is turned off	2. Turn Device On, 4. Turn Device Off	MainWindow, Menu	Go through each button and ensure it does what it should in each relevant context	The arrow buttons navigate the user through menus. The OK button confirms the user's selection, either navigating them to a submenu or performing an action they have selected. It can also be used to stop an in-progress session. The back button brings the user out of a submenu, also stopping a session. The Menu button instantly brings the user to the top of the main menu, also stopping a session. The power button turns the device on or off depending on its current state. All of the buttons besides the power button are disabled when the device is off.
5	The three coloured LEDs light to signal the current coherence level.	6. Coherence Level Indicator	MainWindow	Start a session, and observer the top three LEDs to see that they light and delight in accordance with the curren coherence level.	There are three LEDs at the top of the device: Red, Blue, Green. Red is low, Blue is medium, Green is high. Depending on the user's selected challenge level, different levels of Coherence trigger a change between each level, and this change triggers the LEDs to change in accordance.
6	The main menu allows the user to start a session, view logs, or navigate to settings.	N/A	MainWindow, Menu	Boot up device, and navigate around main menu. Ensure nothing is missing.	The main menu has three options: Start session, which brings up the session view, hides the menu view, and begins a session. History, which lets the user view their previous sessions. Settings, which lets the user change settings or reset the device.

7	Session view displays graph and metrics	8. User Starts a Session	MainWindow, Session	Begin a session, and observe the session display	The session screen has a graph plotting Heartrate over Time, and key metrics including coherence score, length of session, and achievement.
8	Session view has breath pacer	1. Breath Pacer, 8. User Starts a Session	MainWindow	Begin a session, and observe the breath pacer bar	While a session is in progress, a breath pacer will appear to guide the user's breathing. It will increase, to indicate the user should inhale, and then decrease, to indicate the user should exhale. The amount of time the bar stays full can be adjusted.
9	Settings menu lets the user customize the breath pacer speed	1. Breath Pacer, 8. User Starts a Session	MainWindow, Menu	Start the device, and navigate to the settings. Adjust the breath pacer duration. Then, start a session and see if the breath pacer waits the correct amount of time	The user has the option to change the length of time the breath pacer waits before decreasing. This defaults to 10 seconds. If the user changes the setting, the pacer bar should change its behavior accordingly.
10	Settings menu lets the user customize challenge level	6. Coherence Level Indicator, 8. User Starts a Session	MainWindow, Menu, Session	Start the device, and navigate to the settings. Adjust the challenge level. Then, start a session and see if the coherence score calculation is adjusted.	The user has the option to change the challenge level, changing the threshold needed before reaching low, medium, and high levels of coherence. Lower challenge levels make it easier, requiring lower overall levels of coherence, while higher challenge levels require the user to reach higher levels of coherence before switching the blue or green indicators on.
11	Show a summary view when user ends a session	8. User Starts a Session	MainWindow, Session	Start the device, and start a session. After some time, end the session (by pressing back or OK), observe the results screen.	The summary view appears when the user finishes a session. It contains the following information: Challenge level, percentage of time in different coherence levels, average coherence, length of session, achievement score, and entire HRV graph.
12	History submenu contains logs of all previous sessions	7. View Logs	MainWindow, Menu, Session, Log, DBManager	Complete multiple sessions to populate the list, then navigate to the history submenu and look at all of the logs to ensure they are accurate. Then, delete one of the logs. Ensure that the correct log was deleted, and that the list adjusts as needed.	All sessions are logged in the history tab for the user to view later. It includes info about challenge level, percentage of time spent in each coherence level, average coherence, length of session, achievement score, and the entire HRV graph.

13	Full factory reset option in settings menu	5. Reset Device	MainWindow, Log, Menu, DBManager	Complete multiple sessions to populate the list, and adjust the pacer settings and challenge level. Then, press RESET in the settings menu, and confirm. Ensure that the history menu is empty, and that the adjusted variables are set to their default values.	In the settings menu is an option labelled RESET. Selecting it and confirming will wipe the entire device's memory, resetting it to a completely new device. It will have no logs, and the pacer/challenge level settings are at their defaults.
14	There is a battery display	N/A	MainWindow, Profile	Allow the battery to drain and observe the display deplete. Then, charge the battery, and see that it replenishes.	There is a battery indicator on the top left of the screen in all views. It accurately indicates the current battery level, and will change from green to yellow to red as it reaches different thresholds, reaching red when only 20% or less is left.
15	Beep for new coherence level	8. User Starts a Session	MainWindow, Session	During a session, reach different coherence levels, and ensure that a beep goes off each time.	Any time the user reaches a new coherence level is reached, either from above or below, the machine will beep.