**Traceability Matrix**

| ID | Requirement | Related use case | Fulfilled By | Tested by | Description |
| --- | --- | --- | --- | --- | --- |
| 1 | The device is powered ON/OFF | NA | MainWindow, | By click the power ON or OFF in the GUI | The device is powered off by default. User presses the power button to power the device. |
| 2 | User starts a new session | UC 1 | MainWindow, qcustomplot, heartwavecontrol | By clicking “New Session” in the menu. | Starting a new session with the sensor attached starts the heartwave session and displays a graph. |
| 3 | The session graph updates every 5 seconds | UC 1 | MainWindow, qcustomplot, heartwavecontrol | After starting a session, the graph and numbers update every 5 seconds. | User matches their breath with the breath pacer. A coloured light turns on according to the user's coherence level. |
| 4 | User can end the session | UC 1 | MainWindow, qcustomplot, heartwavecontrol, loghistory, | By clicking the end session in the GUI | After starting the session, the user can end the session by clicking select again. They can review the session in the log/history tab |
| 5 | User has the option to log the session or not | UC 1 | MainWindow, qcustomplot, heartwavecontrol, loghistory, | After completing a session, an option will be shown to the user and they will choose to log the session or not. | The log/history will display a screenshot of the graph, it’s length, average coherence and achievement score. |
| 6 | Device displays message when sensor is not attached | UC 1 | MainWindow, | Tested by not having the sensor connected to the device and trying to start a new session. A display message will be shown. | Having the sensor attached is necessary to start a session. A message will pop up if it is not connected. |
| 7 | User can access settings menu | UC 2 | MainWindow, settings | By selecting settings in the Main Menu | The settings tab gives the options to modify the challenge level, modify breath pacer, and reset the device. |
| 8 | User can select their desired challenge level | UC 2 | MainWindow, coherence | From the settings menu, the user selects their desired challenge level using the arrow buttons. | There are four different Challenge Levels; 1, 2, 3, and 4. As the Coherence Score rises you shift up in range (low, med or high) |
| 9 | Select desired number of seconds for the Breath Pacer | UC 3 | MainWindow, settings | From the settings menu, the user can highlight the Breath Pacer in the settings menu and use the arrow buttons to select a number of seconds between one and thirty. | A breath pacer in the form of a box of lights on the device, default set at one breath every 10 seconds |
| 10 | Confirm selection of number of seconds for the Breath Pacer | UC 3 | MainWindow, settings | After choosing a number of seconds for the Breath Pacer, click confirm. | User can set the breath pacer from 1-30 seconds This increases time interval between each breath, default is at 10 seconds |
| 11 | Access Log/History | UC 4,5 | MainWindow, loghistory | By clicking Log/History from the main menu, then using arrow buttons to select the desired session by date. | Log/History displays a screenshot of the graph, its length, average coherence and achievement score. |
| 12 | Delete a logged session | UC 5 | MainWindow, loghistory | After selecting the desired session by date in the Log/History menu, select the delete button with arrow keys. | Delete logs from log/history tab on the device. |
| 13 | Device reset | UC 6 | MainWindow, settings | By navigating to the settings menu, then select the reset device button using the arrow buttons. | Resetting the device does a fresh restart by clearing logs/history and setting all options to default. |
| 14 | Confirm reset device | UC 6 | MainWindow, settings | After selecting reset the device in the settings menu, the user is asked if they want to reset the device. | The user is prompted with a yes or no screen after clicking the reset device option. |
| 15 | Device tracks battery level | UC 7 | MainWindow, | Battery level shown on the top left side of the GUI. | Battery level is drained while the device is being used during a session. |
| 16 | Device battery level consumed | UC 1,7 | MainWindow, | Device consumes more battery while performing a session (Use case 1) than when not in use. | Conserve battery life by ending the session when done. |
| 17 | Device battery level too low to start a session | UC 7 | MainWindow, | Tested by having the battery life less than 5% and attempting to start a session. | If the battery level is at 5% or under, the user is told that the battery is too low to start a session and is returned to the Main Menu |
| 18 | Device battery level too low to continue the session | UC 7 | MainWindow, | Tested by being in the middle of a session and letting the battery life drop to 5%. | If the battery level is at 5% or under during a session, the user is told that the battery is too low to continue the session and is returned to the Main Menu |
| 19 | User can set the battery level | UC 8 | MainWindow, | Set the battery life on the top right side of the device, then clicking the power on button. | The user can set the battery level at start.The lowest percentage the device needs to turn on is five percent. |
| 20 | Connect sensor to device | UC 9 | MainWindow, | User clicks on the Sensor check box to connect the sensor to the device. | The sensor is required to start a session. |
| 21 | Sensor is successfully connected to device | UC 9 | MainWindow, | After checking the sensor check box, the sensor icon appears to show that it is connected. | The sensor is required to start a session. |
| 22 | Sensor disconnect during session | UC 9 | MainWindow, | Test by unchecking the attach sensor box during a session. | If the Sensor is disconnected during the session, the session ends. |