

Traceability Matrix

ID	Requirement	Related Use Case	Fulfilled By	Test	Description
1	The interface for the application consists of buttons and screen display	N/A	MainWindow.ui	Run the mainWindow.ui in Qt	When running the ui application using Qt, the user interface is a replica of the HeartWave device with functional buttons that helps to navigate through the menu and options on the screen.
2	The power of the device is dependent on the battery level of the device.	N/A	MainWindow, Profile	Start a new session to check if the battery level changes.	The class Profile keeps record of the recent battery level of the device. The MainWindow uses that from the class to display on the screen the status of the battery power based on the updates received.
3	Session shows the time length of the current session.	N/A	MainWindow, Log, Session	Start a session to see the time on its session length	The class Session has a QTimer that is used to keep track of time during the session. This is going to be displayed in the MainWindow while the session is active and when the session ends, a new Log object to record the ended session history.
4	Session is activated/functional only when Sensor is switched on on the device.	N/A	MainWindow	Select the menu to start a new session with the sensor switched off, and another time with the	The device has to make sure that the pulse sensor is activated in order to record the session pretty accurately. Therefore the user has to first switch the

				sensor switched on.	sensor on before starting a new session.
5	Active session stops when the sensor is no longer on.	N/A	MainWindow	Start a new session on the device while the sensor is on and turn it off to check what happens to the current session	In the middle of the device doing a session on the pulse reading, if the sensor is switched off, the session will stop where it is at. The MainWindow will then stop and show the status of the recorded session for the duration while the sensor was on.
6	The HRV device supports changing the challenge level for the session in the range of 1 to 4	The user changes the Challenge Level (UC5)	MainWindow, Log, Session	Go to the Settings menu and select the Change challenge level menu to change it.	The challenge level can be changed on the MainWindow ui when a user selects the settings menu to change the levels using the left and right buttons to either decrease or increase the challenge level. The changed level will be updated by the Log class and set the new session according to the new level.
7	The device has 3 frequencies	N/A	MainWindow, Session	Select a session to view the top display as a session is being run.	The MainWindow has a session display that's being run measured but 3 things. When a session is activated, it will start recording the average coherence, session length, and the achievement Score at the top of the display screen. This is kept by the Session and

					recorded to the Log class as it ends.
8	The user has the choice to either keep the record of the current session or discard the current session history	The user manages saves sessions (UC7)	MainWindow, Session	Start a Session on the device then end a session and it will give two options to either keep or discard the session.	The MainWindow records the sessions once the user has started it. However when the session ends, it will give the user choice to keep the recorded session data or discard it before moving on. This will be recorded in the Log class if the user chooses to keep the record.
9	The user can manage to see the history of the previous sessions on the device.	The User manages saved sessions (UC7)	MainWindow, Session, Log	The History menu of the device and select the Review Session History option	On the main menu display of the HRV device, there will be a section of History menu, using the selector button, there will be a sub menu within the History menu. The Review Session History option will show the history of all the saved sessions on the device.
10	The user can clear the session history from the device.	The user manages saved sessions (UC7)	MainWindow, Session, Log	The History menu of the device and select the Clear Session History option.	On the main menu display of the HRV device, there will be a section of History menu, using the selector button, there will be a sub menu within the History menu. The Clear Session History option will give the user option to clear all the session history from the device as the user desires. As the user selects the option,

					there will be two options 'Yes' or 'No' to confirm the user's decision.
11	The application does not contain memory leaks.	N/A	N/A	Valgrind for leak checking.	As the sessions are cleared and edited in the settings, all dynamically allocated memory will be cleared in the destructors.
12	The device can be turned on and off, stopping the functionality as the device turns off.	The device is switched on (UC1), The device is switched off (UC8)	MainWindow	Turn the device on/off but pressing the power button on the interface,, as the device is switched on, the menu options will appear.	The power button is the foundation for the functionality of the device. When the user switches on the device, all the main menu options will be displayed on the screen and become functional.
13	A saved session saves the session date, time, average coherence, session length and achievement score.	The user manages saved sessions (UC7)	MainWindow, Log, Datagen	N/A	The Log consists of records for date, challenge level, achievement score, coherence score, coherence level and session length. As a session is saved into the log, a new record is created under History with all these attributes recorded for the saved session.
14	Device is not functional when the battery level is 0.	Device is switched on (UC1)	MainWindow, Profile	Leave the device for longer or drain the battery by starting a session and when the battery level percentage reaches 0, the	As the battery level get to 0%, the device will automatically shut off and will be non-functional. The user can choose to press the Recharge Battery button on the device to continue using the device

				device becomes non-functional and turns off.	before it reaches 0%. If the user pressed the button to recharge, the device will go up to 100% for the device to continue being functional.
15	At the beginning of a session, the timer will start 0 then starts counting up.	N/A	MainWindow, Session	Start a new session and see the time length as the session is recording.	The Session class has a QTimer added to record the time and with a max time available for controlling the length of session.