ID	Requirement	Use Case	Fulfilled By	Test	Description
1	A light on the machine and/or a symbol on the screen that indicates an active pulse reading	UC1	MainWidow, UI	Run the application, select the sensor button. (on/off)	The sensor is created in the UI and is set checkable, when done so the button turns red indicating a connection.
2	A screen and buttons. The screen contains the menu options and the display graph. There are eight buttons: an off/on button for the device, a menu button, a standard back button which will return the user to the menu, four arrow buttons (up/down,left/right) and a selector in the center of the arrow buttons which also functions as a start/stop button in session mode.	N/A	MainWindow, UI	Run the application, turning on the power button and **Start New Session** observe the GUI. Click the **OK** button to terminate the session.	All elements are visible in the GUI, and implemented by the UI directly. Selective screen visibility is moderated by MainWindow.
3	the device has A led light that changes to red, blue or green to indicating low, medium or high coherence, depending on the challenge level	N/A	MainWindow, UI, SessionInProgressState	Select **Start New Session** check if the top lights turn on/change is displayed when reaching a new coherence level (approx every 5 seconds)	MainWindow tracks the previous coherence level reported by session. On a new level the lights are changed.
4	Press selector to initiate and end a session.	UC1	MainWindow, UI, MainMenuState SessionInProgress SessionSummary	Select **Start New Session** and observe UI changes. Press **OK** again, ending the session and observe UI & data changes	MainWindow changes the UI and currentState to SessionInProgress from MainMenu and SessionInProgress to SessionSummary. Behavior for the OK button is uniquely implemented in the child states.

5	The menu options are displayed as default on the session screen. There is an option at the top to start a new session. The menu could consist of the following options: start new session, settings, log/history.	UC1	MainWindow, UI, MainMenuState	Start the application, and click on the **Power Button.** Observe the GUI.	MainWindow instantiates the MainMenuState, and MainMenuState instantiates the menu.
6	Session screen must display the main HRV graph (HR vs time) with key metrics	UC2	MainWindow, UI, Sensor, SessionInProgressState QCustomPlot	Run the application, turning on the power button and **Start New Session** observe the GUI.	Data for the graph is pulled from Sensor, which is then organized in SessionInProgressState and funneled into MainWindow for QCustomPlot to display.
7	The metrics on the screen include the current coherence score (numerical value), length (duration of session), achievement (total sum of coherence scores sampled every 5 seconds)	UC2	MainWindow, UI, SessionInProgressState	Run the application, click the **Power Button** and **Start New Session** observe the GUI.	The coherence score is calculated by the SessionInProgressState. Results are funneled back to MainWindow to be displayed in the UI.
8	A breath pacer in the form of a strip of lights on the machine itself, or a ball going back and forth on the session screen, default set at one breath every 10 seconds, adjustable in settings	UC2,UC3	MainWindow, UI, SessionSettingsState	Start a session, observe the bar movement, as well as the states **inhale, hold** and **exhale**. To change breath pace navigate to **Set Breath Timer** and select your new value.	MainWindow sets up the movement, states, and defaults of the bar. In Session SettingsState we navigate to the menu where the requested changes can be made and push them in MainWindow.
9	The breath pacer, 1-30 seconds, increases time interval between each breath, default at 10 seconds	UC2	MainWindow, SessionSettingsState	N/A	Default is set up in MainWindow, interval options are available in SessionSettingsState.

10	When the user ends a session a summary view will appear that includes the following information: percentage of time in different coherence levels (low, medium and high), average coherence, length of session, achievement score, entire HRV graph	UC2	MainWindow, UI, Session, SessionSummaryState	Run the application, click the **Power Button** and **Start New Session** observe the GUI. Click on **OK** to end the session. Observe the **Session.**	Default positions are set in UI, and their visibility is moderated there as well. Session holds all of the data to be displayed.
11	The menu contains a log or history tab of all sessions, with dates, when selected show the summary view, as well as the ability to delete a session	UC5	MainWindow, UI, Session SessionHistoryListState SessionSummaryState SessionActionState	Run the application, click the **Power Button** and **Start New Session**. Do so a couple of times to accumulate a list. Then navigate to **Logs/History** to view your sessions. Click **OK** on a session to view it and click **OK** again to see the options for deletion.	Each state corresponds to a new visible menu, with ActionSate holding the deletion options. Session holds all the data which will be reviewed in the SummaryState. MainWindow moderates these changes and the menu items are displayed / hidden in the UI.
12	An option to reset, wipe all data and restore the device to the initial install condition	UC4	MainWindow, UI SessionSettingsState	Run the application, navigate to **Settings,** select **Reset** and then **Confirm.**	Menu display is handled by the Mainwindow, and navigation to the Reset is handled by SessionSettingsState.
13	There is a battery charge indicator on the session screen	N/A	MainWindow, UI	Run the application. **Battery** will drain 1% a second.	Battery settings are set up in mainWindow, decreases per each timer tick.
14	A beep goes off when a new coherence level is reached	UC2	MainWindow	Run the application, turning on the **Power Button** and **Start New**	On each timer expiration the graph is refreshed in MainWindow. Current coherence

				Session observe the GUI. Every 5 seconds a *BEEP* qInfo will appear in the console indicating a new coherence level.	level is checked and if a given threshold is reached a BEEP is printed to the console.
15	If in a session, it is paused when the HR contact is disconnected. Reconnecting un-pauses.	UC2 Extension 1-10.a	MainWindow, UI	Run the application, start a session. Uncheck the hr contact button	Mainwindow calls pauseSession function which stops the update and breath timers, ergo stopping the session.
16	A battery outage, if during a session will save the session prior to shut off.	UC2 Extension 1-14.a	MainWindow, UI, SessionInProgressState	Run the application, start a session. Wait for the battery to run out. Observe the console messages, device shut off and saved session.	MainWindow tracks the battery amount on every update. If below 5% MainWindow will notify the User of critical battery in the console. If at 1% Mainwindow Calls endSession in sessionInProgressState, saves the session and turns off the device.