

ID	Requirement	Related use case	Fulfilled by	Description	Test
1	Device establishes a baseline average frequency for an EEG site over the period of one minute	Starting New Session (UC1)	NeuresetDevice, EEGHeadset, Electrode	When EEGHeadset starts a measurement of an electrode, a WaveForm is generated, and the dominant frequency is calculated based on extracted frequencies and amplitudes	Start a session and observe console output
2	Device administers one second treatment for an EEG site according to LENS protocol	Starting New Session (UC1)	NeuresetDevice, EEGHeadset, Electrode	Upon baseline measurement completion, NeuresetDevice calls EEGHeadset's startTreatment() with increasing frequency depending on the current stage in order to set the correct offset, and applies the treatment to each electrode site	Start a session and observe console output
3	Overall baseline average is calculated concurrently for all 21 EEG sites at the beginning and end of a session	Starting New Session (UC1)	NeuresetDevice, EEGHeadset, Electrode	NeuresetDevice calls calculateOverallBaseline() at the beginning and end of a session, which prompts the EEGHeadset to start a measurement of each electrode site's baseline concurrently using a QFutureSynchronizer. Once all baselines are measured, the EEGHeadset computes the average	Start a session and complete the treatment. The before and after baseline averages are recorded in the session history and can be viewed by selecting the session log option from the device menu
4	Application interface has a display, buttons, lights, and battery charge indicator	N/A	MainWindow	Uses QT's built-in user interface framework to create a simulated version of the Neureset device	Run the simulator in Qt to open the main window and observe the UI
5	Upon selecting the "new session" option, a timer is opened and begins once contact is initiated	Starting New Session (UC1)	MainWindow	mainwindow.ui has a button simulating establishing contact. When a session is started and this button has been pressed, a QTimer is started	Start a new session from the menu and select the "establish contact" button, and observe the timer
6	At any given time during a session, timer shows approximate time remaining, along with a progress bar indicating percentage	Starting New Session (UC1)	MainWindow, NeuresetDevice	NeuresetDevice frequently emits the session progress percentage as the session goes on. Display continually updates to show the remaining time as well as the progress bar percentage	Start a session and observe the timer and progress bar
7	During a session, blue light is turned on while contact is maintained	Starting New Session (UC1)	MainWindow	MainWindow keeps a boolean storing whether or not contact is established. Upon starting or resuming a session, if contact is established, the blue contact light is turned on, and is turned off if contact is lost at any point	Start a session and observe the blue light, clicking the "lose contact" and "establish contact" buttons to see how the light is affected
8	Whenever contact is lost, session is paused, red light flashes	Handling Lost Connection (UC6), Pausing Session (UC2)	MainWindow	mainwindow.ui has a loseContactButton to simulate losing contact with the EEG headset. When this button is pressed, the red contact lost light flashes.	Start a session and click the "lose contact" button, and observe the red light
9	If contact is lost and is not reestablished within 5 minutes, the device turns off and the session is erased	Handling Lost Connection (UC6)	NeuresetDevice, EEGHeadset, MainWindow	When a session is paused, NeuresetDevice begins a 5-minute QTimer. When the pause timer times out,	Start a session and click the "lose contact" button and wait for 5 minutes. Observe the device UI

				cancelSession() is called, which prompts the EEGHeadset to delete the current session. MainWindow also has its own QTimer, and if contact is not reestablished, the display is updated to inform the user that the device has been turned off	
10	During a session, green light flashes while one second treatment is being delivered	Starting New Session (UC1)	MainWindow, NeuresetDevice	NeuresetDevice emits a signal indicating that treatment is being applied. When MainWindow receives this signal, the green treatment light is flashed	Start a session and observe the green light while treatment is delivered
11	User can press the pause button to pause a session at any time	Pausing Session (UC2)	MainWindow, NeuresetDevice	mainwindow.ui has a pause button that, if clicked while a session is ongoing, saves the remaining time on the timer before stopping it, and prompts the NeuresetDevice to pause.	Start a session and observe the timer after pressing the pause button
12	Each session is recorded with its time and date as well as before and after baselines	Starting New Session (UC1)	EEGHeadset, NeuresetDevice, Session, SessionLog, MainWindow	EEGHeadset stores a pointer to the current Session, initialized in the constructor, and sets the start time upon the beginning of a new session. The EEGHeadset's handleBaseline() sets the before and after baseline averages, and upon completing the after baseline calculations at the end of a session, emits the Session pointer along with the MainWindow's current dateTime so that the NeuresetDevice can receive it. The NeuresetDevice then sets the Session's end time, and adds it to the SessionLog	N/A
13	User can view the time and dates of past sessions by pressing the session log button	Viewing Session Log (UC3)	MainWindow, NeuresetDevice	mainwindow.ui has a menu including an option to view the session log. When this option is selected, MainWindow gets the SessionLog from the NeuresetDevice and loops over each session, adding the time and date info to a QString to be displayed	Complete a treatment. Click the session log option from the menu and observe the display
14	The full session log (time, date, before and after baselines) can be uploaded to a PC	Uploading Session Data to PC (UC4)	MainWindow, PCWindow, PC, TransferWindow	mainwindow.ui has a button for uploading to the PC. Clicking this button creates a PCWindow instance. When the PC and NeuresetDevice are connected, a "Transfer data" button is enabled in the pcwindow.ui, and clicking it prompts the PC to retrieve the SessionLog from the NeuresetDevice. The sessions are displayed in a popup TransferWindow, allowing the user to cancel the transfer or commit the sessions to an underlying SQL database. Once uploaded, the full sessions are displayed in the pcwindow.ui	After completing at least one treatment, click the "Upload to PC" button to open a PC window. Check the "Neureset Connected" checkbox on the PC Window to enable the "Transfer data" button. Clicking this brings up a confirmation window. Click "Save to Database" to confirm the transfer, and then observe the PC UI

15	User can adjust the current time and date by pressing the time and date setting button	Changing Time and Date (UC5)	MainWindow	Selecting the time and date option from the menu in mainwindow.ui brings up the date/time edit, allowing the user to adjust it	Click the update date and time button from the menu and enter changes
16	Battery level goes down over time while application is on	N/A	MainWindow	Battery level is represented in mainwindow.ui as a slider that goes down as a session progresses	Start a treatment and observe the battery icon
17	Device becomes non-functional when the battery level reaches 0	N/A	MainWindow	MainWindow uses a QTimer to check the battery level periodically. When the battery level reaches 0, the current session is ended and the NeuresetDevice is turned off.	Run treatments to drain the battery until it reaches 0 and observe the display