

Traceability Matrix

ID	Requirement	Related Use Case	Implemented by	Tested by	Design
1	User starts a new session	Normal Operation (Use case 1)	Mainwindow::startSession(), MainWindow::electrodeConnectionCheck()	Choosing the "New Session" option in the menu after turning on all EEG's	The startSession() first checks if all the EEGs are turned on and if the device's battery is less than 10%. If any of these requirements are not met, the device does not start a new session and prints an error to the console. The startSession function also keeps a sessionInProgress boolean that helps stop the session whenever the session is paused / ends.
2	Timer begins once contact is initiated	Normal Operation (Use case 1)	Session::startTreatment(), Session::Session()	Viewing the elapsed time after a session is completed .	A QTimer currentTimer is initialized in the session constructor. Once the playSession() function is called to resume or start a new session, the QTimer is turned on and keeps track of the elapsed time.
3	Device calculates the overall baseline for all 21 EEG sites concurrently at	Normal Operation (Use case 1)	Session::startSession(), Session::calculateBaselineAvg()	Choosing the "New Session" option in the menu after turning on all EEG's	

	the start of the session .				
4	Device calculates the baseline average frequency for each EEG site before treatment (1 minute)	Normal Operation (Use case 1)	Session::startSession(), Session::calculateBaselineAvg()	Viewing the session Logs after a treatment is completed	
5	Treatment starts, adding an offset frequency of 5hz to the baseline and recalculating every 1/16th of a second , 16 times (1 second)	Normal Operation (Use case 1)	Session::startTreatment(), Session::recalculateBrainwaveFrequency()	Choosing the "New Session" option in the menu after turning on all EEG's, console outputs treatment progress	

6	Device calculates the baseline average frequency for each EEG site after treatment	Normal Operation (Use case 1)	Session::stopSession(), Session::calculateBaselineAvg()	Viewing the session Logs after a treatment is completed	
7	Green light flashes during treatment	Normal Operation (Use case 1)	Session::startTreatment(), Session::startRound(), Session::greenLightOn(), , Session::greenLightOff(), MainWindow::treatmentLedHandler()	Choosing the “New Session” option in the menu after turning on all EEG’s, Green light is flashed during recalculations	The MainWindow contains a treatmentLedHandler() function that is connected to a signal in the Session class called turnOnGreen. This signal is controlled by the greenLightOn() and greenLightOff() functions in the Session class. They are used at the start of a treatment, and at every round of adding an offset frequency. Once the treatmentLedHandler() receives the signal, it changes the style sheet's background color to green.
8	Blue light is turned on when timer is initiated	Normal Operation (Use case 1)	MainWindow::electrodeConnectionCheck(), MainWindow::contactLedHandler()	Choosing the “New Session” option in the menu after turning on all EEG’s	The MainWindow contains a contactLedHandler() function that changes the style sheet's background color to blue. It is called one time

					inside the electrodeConnection Check() function. It turns on a blue light once all nodes are connected, indicating the start of the timer and a new session.
9	Red light flashes when contact is lost	Connection loss between electrodes and device (Use case 4)	Session::checkIfConnectionLost(), MainWindow::contactLedHandler(), turnOnRed()	Disconnecting and EEG during treatment	The MainWindow contains a lostLedHandler() function that is connected to a signal in the Session class called turnOnRed. This signal is controlled inside the checkIfConnectionLost() function. The function emits the signal if one of the EEG's is disconnected. Once the lostLedHandler receives the signal, it changes the style sheet's background color to red.
10	If contact is not established after 5 minutes, device is turned off	Connection loss between electrodes and device (Use case 4)			
11	Timer shows approx time	N/A		Choosing the "New Session" option in the menu	

	remaining			after turning on all EEG's, timer should be visible on the device	
12	Session progress bar is indicated by a percentage	N/A		Choosing the "New Session" option in the menu after turning on all EEG's, progress bar should be visible on the device	
13	Session log preview history that displays the time, date and session name	Therapy history viewing (Use case 2)	MainWindow::deviceLogsPreview()	Selecting the "Preview Logs" option in the "Session logs menu" then viewing the information on the device itself	The MainWindow contains a deviceLogsPreview() function that is called if the user selects the Preview session logs option. This function gets information from the sessionsLog list and formats it to fit into a QStringList. That list is then passed into an updateMenu function that displays the session logs onto the device.
14	Upload to pc option that allows user to view before and	Therapy history viewing (Use case 2)	MainWindow::sendLogstoPC()	Selecting the "Upload To Pc" option in the "Session logs menu"	

	after baselin es for each session			then viewing the baseline informatio n on the file.	
15	Option to change current date and time	N/A	MainWindow::setTime(), MainWindow::setDate(), displayCurrentDateAndTime()	Selecting the “Time & Date” option in the menu then adjusting the time and date	If the “Change Date” or “Change Time” options are selected, the mainWindow makes a ui element visible, this ui element then allows the user to change the date or time respectively. It then updates the current time/date using the setTime() and setDate() functions provided in the QDateTimeEdit object.
16	User can press pause volunta rily during a session	Connecti on loss between electrode s and device (Use case 4)	MainWindow::pauseSession()	Clicking the pause button during the session	The sessions can be paused by pressing the QPushButton “pauseButton”. This button is connected to the pauseSession() function that sets the boolean sessionInProgress to false, and pauses the current Session.
16	Device display s a “battery low” messa ge when device battery	Battery low response (Use case 3)	MainWindow::drainBattery()	BatteryLo w QDialog appears when device battery reaches 20%	When the device reaches 20%, the drainBattery() function creates a batteryLowMessage Object. batteryLow.exec() is then called which displays a QDialog window indicating

	reaches 20%				that the battery is low.
--	-------------	--	--	--	--------------------------