ID	Requirement	Use Case #	Design Elements	Test	Design Description
1	ON switch	1	MainWindow, Device	Ensure the device is off. Press the Power Button and observe as the rest of the device becomes enabled.	When you press the PowerButton a signal is sent in MainWindow and causes the Device to turn on enabling the rest of the device.
2	OFF Switch	2	MainWindow, Device	Ensure the device is on. Press the Power Button and observe as the rest of the device becomes disabled.	When you press the PowerButton a signal is sent in MainWindow and causes the Device to turn off, disabling the rest of the device.
3	Continuous circuit check when electrodes are in contact with the skin indicated by a test circuit symbol that shows contact ON (connected) or OFF (disconnected).	3	MainWindow, Device	Switch "Attach Probe to Skin" to false and observe the "Powered" checkbox be unchecked. Switch "Attach Probe to Skin" to true and observe the "Powered" checkbox be checked.	When you switch the "Attach Probe to Skin" ComboBox, a signal is sent in MainWindow and changes the "Powered" checkbox.
4	If skin contact is lost during treatment for less than 5	3	MainWindow, Device	Start a treatment and ensure the "Attach Probe to Skin" is true. Switch "Attach Probe	When you switch the "Attach Probe to Skin" ComboBox, a signal is sent in MainWindow and changes the "Powered" checkbox. The slot

				to Skin" to false and observe the "Powered" checkbox be unchecked. Observe after 5 minutes the treatment stops and the device powers off. If you switch "Attach Probe to Skin" to true before 5 seconds is completed, observe the treatment resuming.	toggleSkinInContact() checks if the device is not in contact and connects a QTimer to the slot padsFellProtocol. A signal is sent every second to padsFellProtocol, where a variable "checked" is incremented. Once "checked" reaches 5, the device will be disabled. However, if the "Attach Probe to Skin" ComboBox is set to true before "checked" reaches 5, the QTimer will stop.
5	Three frequency options of 0.5Hz, 77Hz and 100Hz.	4	MainWindow, Treatment, Device	Before the treatment starts, choose a frequency from the Radio Buttons at the top of the UI.	When a frequency is picked, it will send a signal in MainWindow, and check which frequency is checked, before having the Device set the Treatment frequency.
6	Three wave form options Alpha, Betta and Gamma.	10	MainWindow, Treatment, Device	Before the treatment starts, choose a waveform from the Radio Buttons at the top of the UI.	When a wave form is picked, it will send a signal in MainWindow, and check which wave form is checked, before having the Device set the Treatment waveform.
7	20, 40 or 60 minute countdown cycles.	5	MainWindow, Treatment, Device,	Before the treatment starts, choose a countdown cycle. Press the "Time" Button and adjust the cycle with the Up and Down Buttons.	The upButton and downButton's released signals are connected to the MainWindow's upButtonPressed() and downButtonPressed() slots. Every time one of the Buttons are pressed, it is checked whether the "Time" Button was clicked. If so, the device sets the Time Cycle of the Treatment.

8	Large timer display. Treatment starts when electrodes touch skin	5		MainWindow, Treatment, Device,	Ensure a countdown cycle has been selected and the treatment has started. Observe the treatment countdown.	The MainWindow's lcdNumber displays the countdown. The lcdTimer's timeout() signal is connected to the MainWindow's decreaseTime slot. Everytime the lcdTimer decrements, the lcdNumber display also decrements. When the "Time" Button is clicked at the start, the lcdNumber is initialized to the device's selected time cycle. When the remaining time reaches 0, the lcdTimer stops, the device is disabled, and the treatment is recorded if desired.
9	0 - 500 μA (microampere) current control (1-10): 50 μA when incrementing and 100 μA when decrementing.	6		MainWindow, Treatment, Device,	Ensure the treatment has started. Press the "Intensity" Button. Adjust the current with the Up or Down Buttons. Observe that everytime you increase the current it goes up by 50 and everytime you decrease the current it goes down by 100.	The upButton and downButton's released signals are connected to the MainWindow's upButtonPressed() and downButtonPressed() slots. Every time one of the Buttons are pressed, it is checked whether the "Intensity" Button was clicked. If so, the device will retrieve the device's treatment current which will either increase by 50 or decrease by 100. If the treatment is currently at 500 and the user requests an increase, the current becomes 50. If the treatment is currently at 0 and the user requests a decrease, the current becomes 400. If the treatment is at 50 and the user requests a decrease, the current becomes 450.
10	30 minute auto - off when not in use.			MainWindow, Treatment, Device,	Ensure a treatment has not started and that the device is powered on. Do	A QTimer, skin30Timer's timeout() signal is connected to the MainWindow's check30sec() slot if the treatment has not started on the

				nothing on the device for 30 seconds and observe the device turn off.	device. If connected, the QTimer will call the slot every second and will increment a variable. Once the variable reaches 30, the timer stops and the device is disabled.
11	Battery charge indicator: device issues a warning at 5% charge and shuts down at 2% after issuing another warning.	7	MainWindow, Device,	Ensure the device is turned on. Observe the Battery Bar at the top left and watch it decrease. When the device reaches 5% battery, observe a MessageBox warning you the device is at 5%. When the device is at 2%, observe a MessageBox warning you the device will turn off, and observe the device shutting off.	The Device starts at 100% and the Battery Bar's value is set at 100 upon initialization. The Battery Bar's maximum is set to 100 and its minimum is set to 0. A QTimer for the battery is connected to the slot decreaseBattery in MainWindow. The QTimer is set so every 5 seconds the battery will be decreased if the device is on. The battery is decreased by the formula (current/100 + 1) or just by 1 if current is 0. Once the battery is decreased, the value is set in the Battery Bar. If the power reaches 5%, a MessageBox is displayed warning the user. At 2%, another MessageBox is displayed and the device will be disabled after.
12	Recording: user can choose to record a therapy and add to the history of treatment. Assume only a single user. Therapy	8/9	MainWindow, Device, Treatment	Start a treatment, and choose the waveform, frequency, and duration of the treatment. Check the "Record at the end of treatment" box. At the end of the treatment, click the "History" Button and observe the treatment has	When the recordCheckBox is checked, a signal is sent in MainWindow to recordButtonPressed, which then sets the Device to start recording. If isRecording in Device is true, the device saves the treatment in a QList, and adds it to the treatmentListWidget. When the History Button is pressed, a signal is sent to the historyPressed() slot in MainWindow, which enables the treatmentListWidget. The treatment is

				been recorded. Select the recorded treatment, start it, and observe it is started with the same Waveform, frequency, duration, and power level.	replayed based on the index of the treatment in the treatmentListWidget.
	information to be recorded: Waveform, frequency, start time, duration and power level (if changed during therapy choose the last selected power level).				
13	Automatically and permanently disables itself should a single fault develop within the device causing the current to exceed 700 µA.		MainWindow, Device, Treatment	Ensure the device is on. Press the "Exceed Current Limit" Button. Observe the device being shut off.	When the "Exceed Current Limit" Button is pressed, a signal is sent in MainWindow to exceedDeviceCurrent() and sets the device current to 700. A QTimer in MainWindow checks the device current by sending a signal to currentExceeded() in MainWindow and if it ever exceeds 700, the device will be shut off.