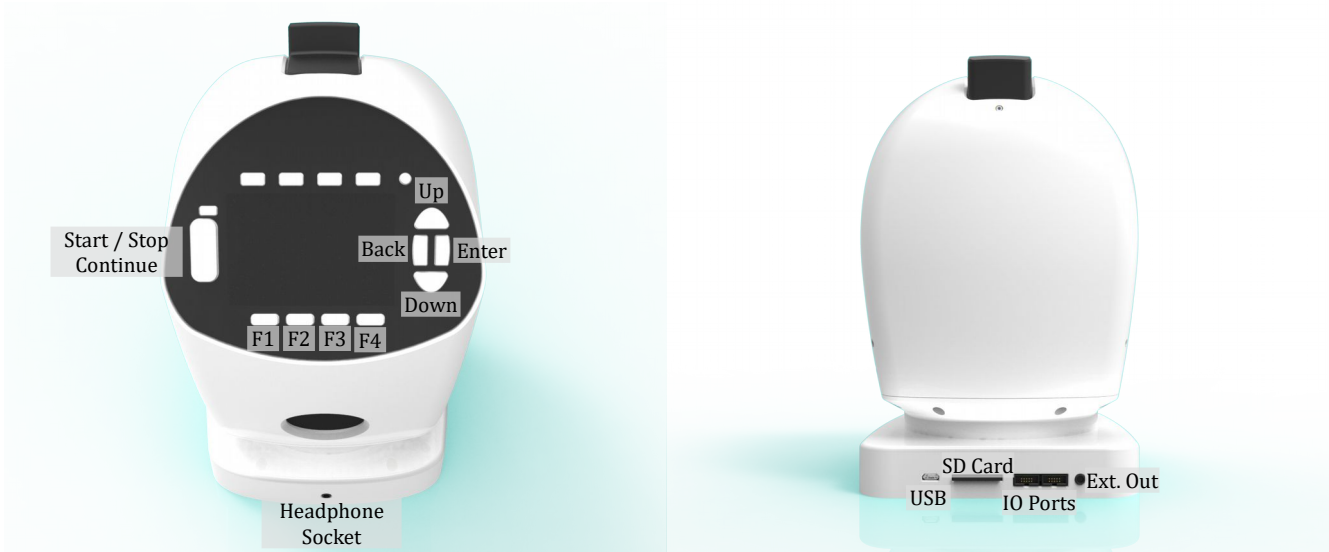# User Interface

ZUMI uses a simple user interface consisting of a START/STOP button, D-pad and function buttons.

Button	State	Function
Start /Stop Continue	Idle Running Waiting	Start a test sequence Stop a test sequence Skip waiting and continue
Up	Viewing graph Viewing menu Changing value	Change to next graph page Move up selected item Increment value
Down	Viewing graph Viewing menu Changing value	Change to previous graph page Move down selected item Decrement value
Enter	Viewing graph Viewing menu Changing value	Enter menu tree Select highlighted item Confirm new value
Back	Viewing graph Viewing menu Changing value	- Go back one menu tree level Undo change and deslected value

Power Up

ZUMI uses a 5V power supply through a USB micro socket on the rear. Power can be supplied from any 5V source such as a PC, wall charger or power bank.

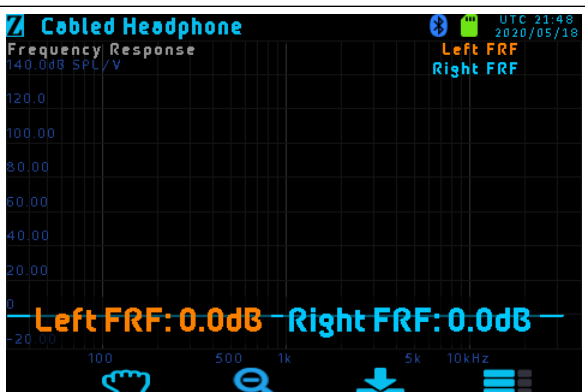Press the power on/off button power on and off the devcie.

When booting is complete the graph display will be visible

Select Profile

To select a test profile;

Press ENTER to enter the menu tree. Use UP / DOWN buttons to highlight 'Select Profile' and press enter		![Main Menu screen] Bluetooth Headphone — UTC 21:30 2020/05/18 **Main Menu** Select Profile > Edit Profile > Pass Fail > Settings > Utilities > ZUMI V0.91
Use UP / DOWN buttons to highlight the required test profiles and press ENTER		![Select Profile screen] Bluetooth Headphone — UTC 21:29 2020/05/18 **Select Profile >** Preset Template Profiles Bluetooth Headphone Cabled Headphone BT Battery Life ANC Manual ANC Loop Feedforward Acoustics
The selected profile will load and return to the graph display		![Cabled Headphone graph] Cabled Headphone — UTC 21:48 2020/05/18 Frequency Response — Left FRF, Right FRF 140.0dB SPL/V 120.0 100.00 80.00 60.00 40.00 20.00 0 -20.00 Left FRF: 0.0dB Right FRF: 0.0dB 100 500 1k 5k 10kHz

Simon Weston

Bluetooth Headphone

The bluetooth headphone profile will measure the frequency response for a headphone through the bluetooth connection. The measurement will check, frequency response, channel assignment, polarity and channel balance by default. The test is executed in two parts, the first part with ANC OFF and the second with ANC ON. (NOTE This is test does not measure the ANC level).

Step	User Action	ZUMI Action	Note
1	Select test profile 'Bluetooth Headphone'	-	If Bluetooth Headphone was the last used profile it will load by default on reboot
2	Switch ANC OFF Set headphone to pairing mode	-	
3	Place headphone	-	
4	Press START	-	
5	-	LED light flashes while ZUMI attempts to connect to the bluetooth device	ZUMI will connect to any device in pairing mode, this may take several seconds
6	-	Connection completee.	The user can specify a waiting time after the connection is established to allow the device to finish and message prompts before testing
7	-	ZUMI executes measurement	You should be able to here the test signal sweep sound.
8	-	LED light flashes while ZUMI waits fort he user to switch ANC ON	
9	Switch ANC ON	-	If the headphone does not have ANC you can ignore this step
10	Press START button	-	Pressing start button here tells ZUMI to stop waiting and proceed with the measurement
11	-	ZUMI executes measurement	You should be able to here the test signal sweep sound.
12	-	Test Complete	When the test is complete ZUMI will disconnect bluetooth.

This test produces 4 result graphs, Frequency Response with ANC OFF, Channel balance with ANC OFF, Frequency response with ANC ON and channel balance with ANC ON
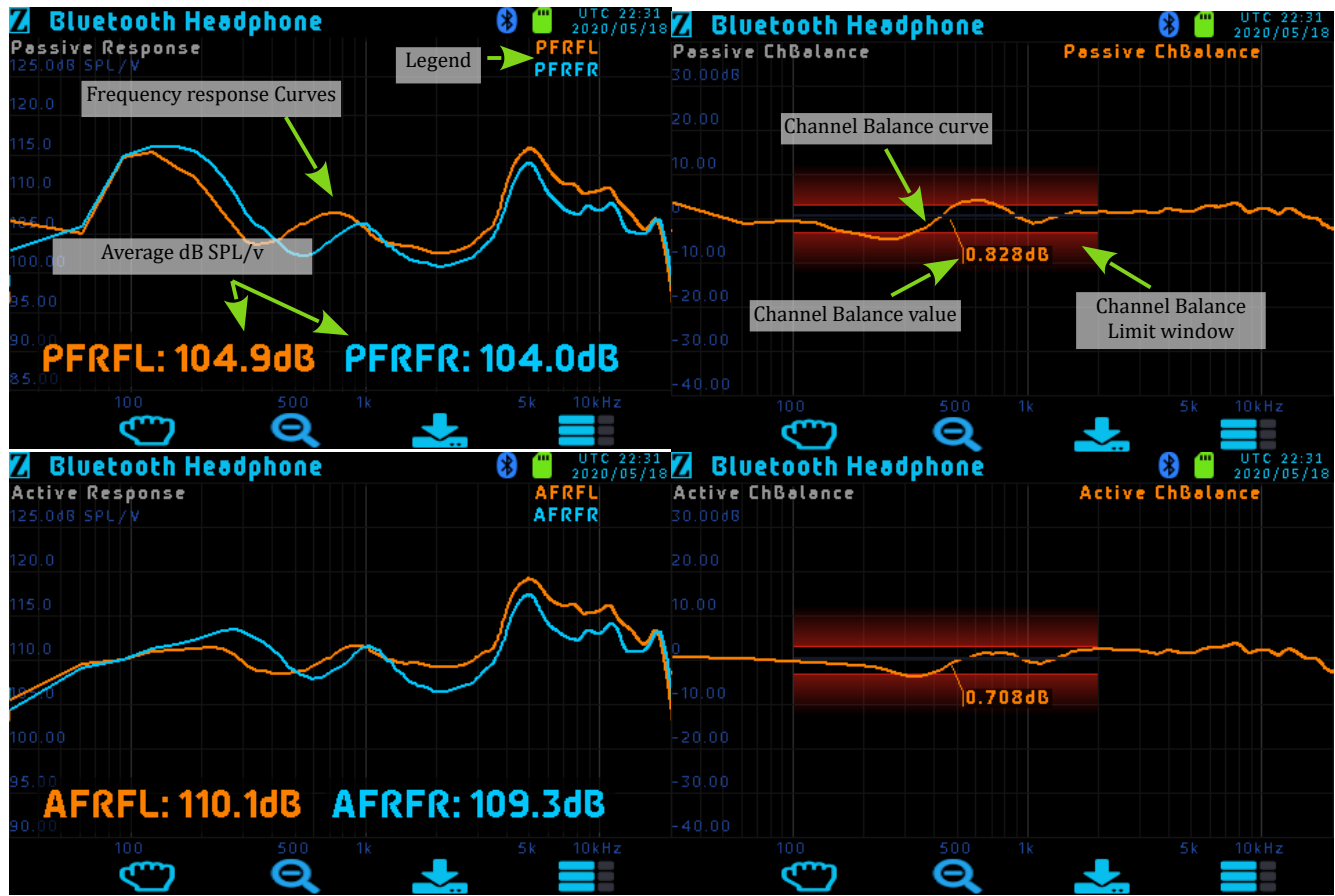
ANC Manual

The ANC manual profile measures the headphones ANC and frequency response. The ANC test requires external loudspeakers. The speakers shall be connected to ZUMI's rear socket. Typically speaker are positioned either side of ZUMI at a distance of approx. 25cm. The speaker must have good low frequency output (at least 50Hz). The frequency response is measured through the headphone cable (NOTE by default this test does not use bluetooth).

Step	User Action	ZUMI Action	Note
1	Select ANC Manual test profile	-	
2	Connect headphone cable to ZUMI front socket Switch OFF ANC	-	By default this test is configured to use a cabled test signal to the headphone. You can ignore the frequency response if its not needed
3	Press START	-	-
4	-	ZUMI will first output a test signal on the headphone socket and measure the frequency response, then output to the rear socket to make the first part of the ANC measurement	-
5	-	LED lights flash to indicate ZUMI is waiting for the user	-
6	Switch ON ANC	-	-
7	Press START	-	-
8	-	ZUMI will first output a test signal on the headphone socket and measure the frequency response, then output to the rear socket to make the second part of the ANC measurement	-
9	-	Test Complete	-

This test produces 4 results graphs. The frequency response, channel balance, ANC curves and Noise spectrum.

The frequency response graphs shows the frequency for left and right of both ANC on and ANC off together. Similarly the Channel balance graph shows the channel balance for ANC on and ANC off together. The ANC curve shows the spectral character of the ANC as well as the total area under the curve. The Noise spectrum data is used to make a quick check of the sound generated byt eh external speakers.