# VISER
Audio Spectrum Visualiser
by Dr Pinball

Viser is an audio spectrum analyser that displays a graphical representation of sound captured via the built-in microphone or the direct line connections.

There are various menu options to control the behaviour of Viser – it's possible to tune the performance and display to suit your room conditions and get the best results.

Viser can capture sound from your room and show you in a mesmerising way how that sound is composed. Most sound we hear is made up of many frequencies – Viser will allow you to see these different components.

Try whistling at Viser and see the display react!
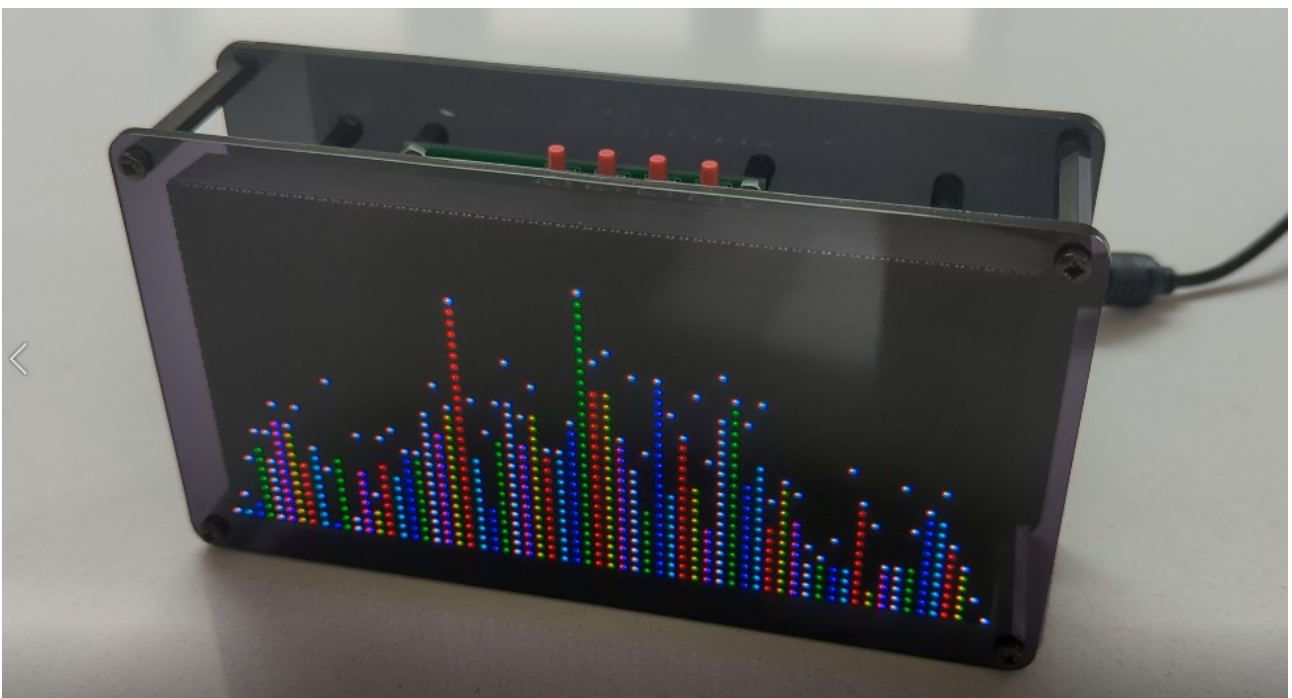
Connections

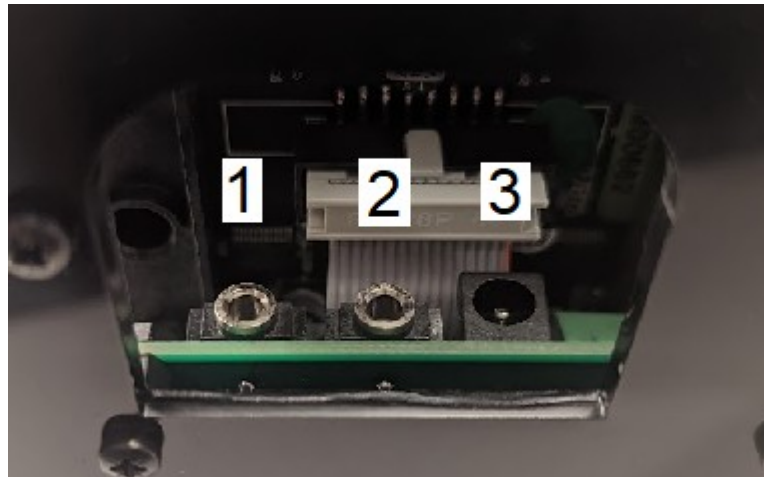Figure 1 shows the audio and power connections.

Figure 1 – Connections

Connection 1 / Connection 2 – Direct audio using 3.5mm stereo jack plugs. Both sockets are connected to each other allowing pass through of audio. Either socket can be used for input and output.
These connections allow direct connection to a hifi or television, for example.
You must select Line from the Input menu item to use the direct audio connections, see below.

Connection 3 – This is the 5V power connection. Connect the supplied power supply.

For all connections it's possible to loop cables from the back so that they will not be seen from the front.

Buttons

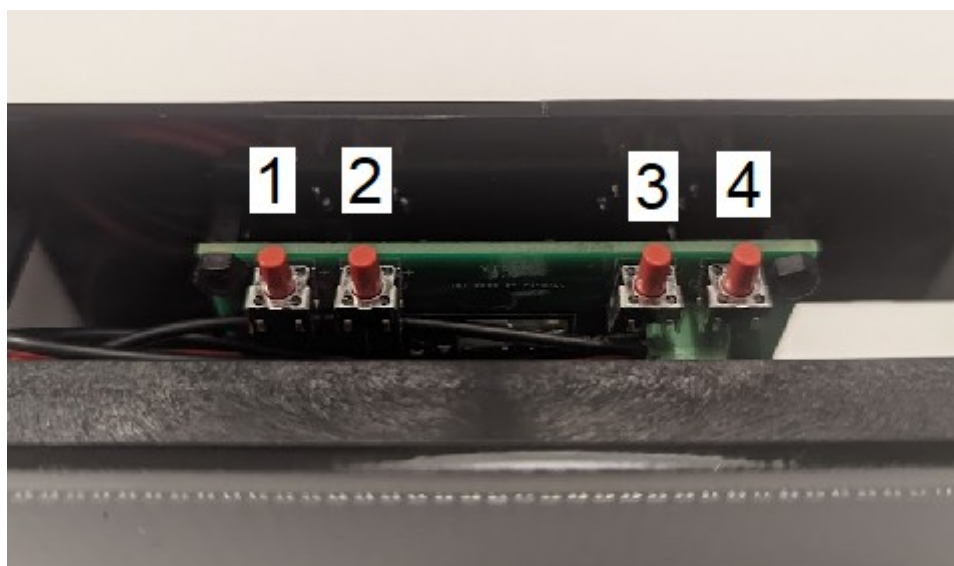Figure 2 shows the buttons accessible from the top of Viser.

Figure 2 – Menu buttons

Button 1 – Show menu. When changing a menu item this button will go back without saving. Use this button to exit from the menu.
Button 2 – Select menu item to change its value. Press again to save the changed menu item.

Button 3 – Move to the previous menu item, or change to the previous menu item value after pressing button 2.
Button 4 – Move to the next menu item, or change to the next menu item value after pressing button 2.

Pressing Buttons 3 and 4 outside of the menu will move the display through the different visualisations.

Menu
After pressing Button 1 you will see a menu on the screen. Move through the menu items using buttons 3 and 4.
Press Button 2 to change a menu item, and move through the available values again using Button 3 and 4.
Press Button 2 to save your change, or press Button 1 to ignore your change.
Press Button 1 to exit the menu.

VISER – Choose the visualisation shown on the screen. Menu items are as follows:
- VU
- VU PK
- VU PK DN
- VU PK UP
- BUG
- BUG PK
- BUG PK DN
- BUG PK UP
- CTR
- CTR PK
- CTR PK DN
- CTR PK UP
- RANDOM

Each of these items behave in the following way:
- VU – Shows a VU style display with bars from left to right representing the audio intensity at increasing frequencies. Looks like a retro graphic equaliser!
- BUG – Shows bars reflected horizontally from left to right representing the audio intensity at increasing frequencies. Looks like an insect!
- CTR – Similar to VU, but bars start in the middle and alternate left and right representing the audio intensity at different frequencies
- PK – Shows a coloured dot on the peak of each bar
- PK DN - Shows a coloured dot that falls after the bar has reached its maximum
- PK UP - Shows a coloured dot that rises after the bar has reached its maximum
- RANDOM – Rotates through random combinations of Viser, Peak Colour and Bar Colour, changing each minute.

PK COLOR – Choose the colour of the peak dot. Menu items are as follows:
- RED
- GREEN
- YELLOW
- BLUE
- MAGENTA
- CYAN
- WHITE

BAR COLOR - Choose the colour of the bars. Menu items are as follows:
- RED
- GREEN
- YELLOW
- BLUE
- MAGENTA
- CYAN
- WHITE
- METER – Intensity shown in green, yellow and red from minimum to maximum
- RAINBOW – Multicoloured bars

BAR WIDTH – Choose the width of each bar. Menu items are as follows:
- 1 PIXEL
- 2 PIXELS
- 4 PIXELS
- 8 PIXELS

BRIGHT – Adjust the brightness of the display. Use Buttons 3 and 4 to decrease and increase.

MIN dB – Adjust the minimum intensity of sound that will be shown on the display i.e. affects when bars will start to be seen. Menu items are as follows:
- 00dB to 50dB

MAX dB - Adjust the maximum intensity of sound that will be shown on the display i.e. affects when bars will hit the display maximum (saturate). Menu items are as follows:
- 60dB to 120dB

Auto dB – Automatically adjust the MIN dB and MAX dB – Viser will try to make bars fit within the display. Note that the minimum possible is set by MIN dB, but the maximum can go between 60dB and 120dB. Menu items are as follows:
- OFF
- ON

MAX FREQ – Sets the maximum frequency of intensities displayed. This will affect the highest pitch sounds that you will see. Frequencies always start at 40Hz (low, bass sounds) but the maximum can be chosen from the menu items as follows:
- 4 KHZ
- 8 KHZ
- 16 KHZ

INPUT – Choose the method by which audio is captured. Menu items are as follows:
- MIC – Use the internal microphone on the back of Viser
- LINE - Use the direct 3.5mm jack audio sockets.

MIC GAIN – The internal microphone incorporates a built-in amplifier. This menu item will set the gain of this amplifier. Use this if the sounds you wish to visualise are quiet. Menu items are as follows:
- 40dB – Lowest amplification
- 50dB
- 60dB – Highest amplification

MIC AR – The internal microphone has Attack Rate for the internal Auto Gain Control. It is suggested to leave this menu item at 1:4000. Menu items are as follows:
- 1:4000
- 1:2000
- 1:500

FIRMWARE – Get information on the current firmware version and perform an update. Menu items are as follows:
- VERSION – Show the version
- BOOTSEL – Set Viser into new firmware mode. To get out of this mode remove and restore power.

Further Help
If you need any further assistance don't hesitate to get in touch:
email: pins@drpinball.co.uk

Please visit our shop for other great products:
web: www.drpinball.co.uk

If you are interested in understanding the technology behind Viser, the following are used:
- LED 3 colour display - Red, Green, Blue - 64 X 32 dots
- Raspberry Pico microcontroller – firmware written in C++
- Adafruit auto gain microphone - based on MAX9814 integrated circuit
- Perspex frame - cut using K40 laser cutter
- Other components supplied by Farnell UK Ltd.