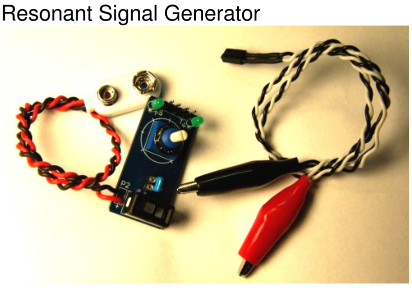
Resonant Signal Generator



SG – LCR2M

Signal Generator – LC Resonator

This tiny module provides a compact and low cost variable square wave signal source.
The device has an output for direct use of the signal and also includes a second output which can be used for matching the resonant frequency of LC (inductor-capacitor) circuits such as Tesla Coils.

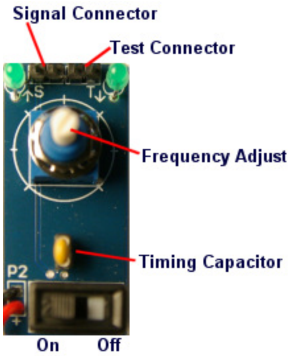
The range of frequencies available is very large so this device an be use for anything from subsonic signals to ultrasonic signals right into the radio frequency (RF) range!

Input - 9V. PP3 clip included for connection to 9V battery.

Features and Specifications

NB: Figures may vary under different loading conditions and environments.

Output 1 – Variable Frequency Square Wave
Output 2 – Variable Frequency Square Wave with current indicator
Frequency Range – < 270 Hz – 1.8 MHz
Duty Cycle – 50% Fixed
Max Output Current: - Sink 150mA, Source 15mA
Max input Voltage – 18V

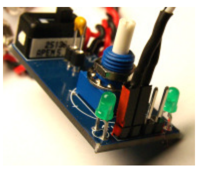


Operation

For use as just a signal source, connect the croc lead to the pin header marked ‘S’. You can then connect the signal to whatever you wish (not exceeding specified limits) using the croc clips. Use the black clip for the common ground and the red clip as the signal source. The frequency of the output is adjusted by turning the white post of the trim pot. Turning this clockwise will increase the frequency of the output.

The timing capacitor can be replaced with any non polarised capacitor to change the range of frequencies available from adjusting the frequency adjust trim pot. The maximum frequency output will be 1.8 MHz which can be obtained using a capacitor such as 100pF. Larger capacitors will give lower frequencies. The device is supplied fitted with a 220 pF capacitor which will give a frequency range of 200 kHz to 1.5 MHz. The other capacitor provided is 220 nF which will give a frequency range of 270 Hz to 6 kHz

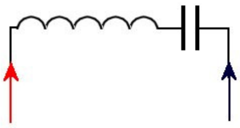
With the croc leads connected to the pin header marked ‘T’, the SG-LCR140K can be used to compare sets of LC resonant circuits. The LEDs give an indication of the relative current draw from the device. When testing a series LC circuit there will be maximum current flow at the resonant frequency. When testing an LC parallel circuit there will be minimum current flow at the resonant frequency.



Connections

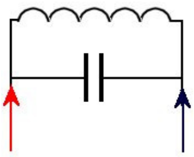
The included croc lead can be connected to pin headers marked ‘S’ and ‘T’. The pair marked ‘S’ is used for the standard signal output.
The pair marked ‘T’ is used for the testing of LC circuits. The outermost pin, nearest the edge of the board is the active signal (+ve) in both cases. The central pins are both connected to GND.

Testing LC Circuits



Series LC Circuit

Connect the croc clips as shown in the diagram. The arrows represent the red and black clips.
Start with the dial turned fully clockwise and then slowly turn it anti-clockwise until the LEDs are most brightly lit. At this point the signal output is matching the resonant frequency of the LC circuit.



Parallel LC Circuit

Connect the croc clips as shown in the diagram. The arrows represent the red and black clips.
Start with the dial turned fully clockwise and then slowly turn it anti-clockwise until the LEDs are most dimly lit. At this point the signal output is matching the resonant frequency of the LC circuit.

Tuning Tesla Coils

Testing the primary circuit is done just like it is shown for the parallel LC circuit shown above. Just short out the spark gap and test as shown above.

To test the secondary circuit make the connections as shown in this diagram and then follow the procedure for the Series LC circuit shown above.

It is usually best to test the secondary circuit and then make a note of the position of the dial on the SG-LCR140K. You can then connect it to the primary circuit and adjust the tapping position on the primary coil until its resonant frequency matches that of the secondary circuit (the LEDs are most dimly lit).

Example Frequency Ranges

Timing Capacitor	Frequency Range
220 nF	0.27 kHz – 6 kHz
10 nF	6 kHz – 150 kHz
1 nF	60 kHz – 820 kHz
220 pF	200 kHz – 1560 kHz
100 pF	415 kHz – 1800 kHz