

RLCcalc

(Version 2.0.0 -- Revised September 24, 2011)

Introduction

RLCcalc is a simple utility for performing common reactance, circuit impedance, resonant frequency, and time constant calculations

Installation & Setup

Run the installation package file, **RLCcalcSetup.exe**. This will install **RLCcalc.exe** and all required supporting files on your computer. The installer will suggest a default location for the program file. You may change the location or leave it at the default, it does not matter. However, the **RLCcalc.rtf** file must be located in the same directory as the **RLCcalc.exe** file.

Program Operation

Operation of the program is very straightforward. Click on the tab for the type of calculation you wish to perform: Reactance, Impedance, Resonant Frequency & Q, or Time Constant. Then enter each necessary value, selecting its unit of measurement from the dropdown list, and clicking on the "Calculate" button. On all but the **Reactance** tab, you will also need to select the type of circuit.

Calculating Reactance

When you first start the program, the **Reactance** tab will be selected as shown in **Figure 1**.

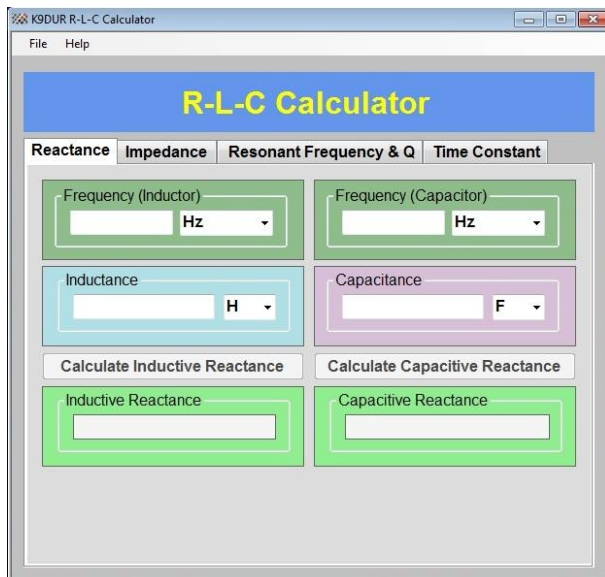


Figure 1 -- Reactance Tab

This tab allows you to calculate the reactance of an inductor or a capacitor.

The left side of the screen is used to calculate the reactance of an inductor, and the right side of the screen is used to calculate the reactance of a capacitor.

To calculate reactance, enter the frequency and then enter the inductance or capacitance and click on the **Calculate....Reactance** button.

Calculating Impedance

Click on the **Impedance** tab to calculate the impedance of an R-L circuit, an R-C circuit, an L-C circuit, or an R-L-C circuit. The **Impedance** tab is shown in **Figure 2**.

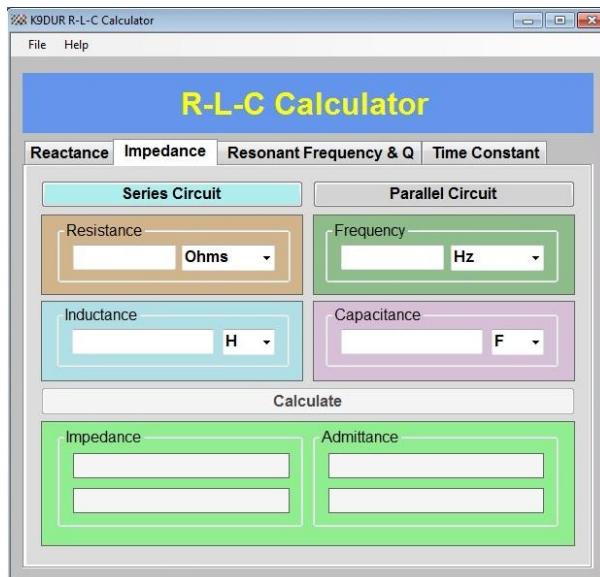


Figure 2 -- Impedance Tab

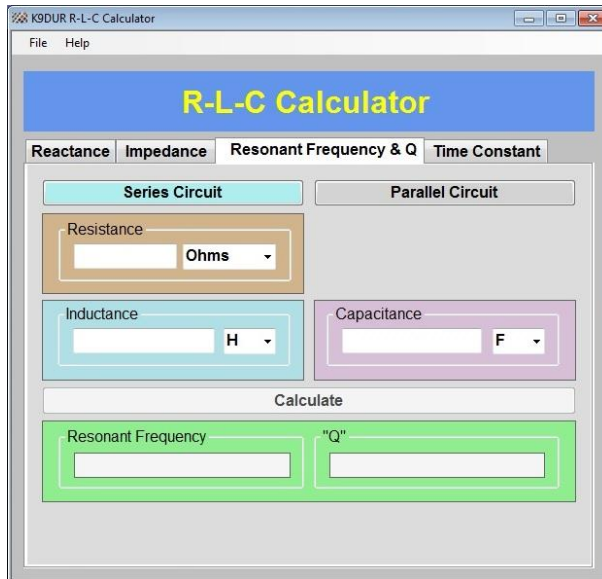
First, you will need to select whether you are calculating the impedance of a series circuit or a parallel circuit. A series circuit is selected by default. Click on the **Series Circuit** button to calculate the impedance of a series circuit or click on the **Parallel Circuit** button to calculate the impedance of a parallel circuit.

Enter each of the component values & select the units of measurement. If the circuit does not have component, simply leave its value blank. For example, if you are calculating the impedance of an R-L circuit, leave the capacitance value blank (or zero). You must always enter the frequency, however.

When all of the component values and the frequency have been entered, click on the **Calculate** button to display the circuit impedance and admittance.

Calculating Resonant Frequency and Q

Click on the **Resonant Frequency & Q** tab to calculate the resonant frequency of an R-L-C circuit or of an L-C circuit. The **Resonant Frequency & Q** tab is shown in **Figure 3**.



The screenshot shows a web-based application window titled "K9DUR R-L-C Calculator". The window has a menu bar with "File" and "Help". Below the menu bar is a blue header with the text "R-L-C Calculator" in yellow. Underneath the header are four tabs: "Reactance", "Impedance", "Resonant Frequency & Q" (which is selected), and "Time Constant". The "Resonant Frequency & Q" tab contains two buttons: "Series Circuit" (highlighted in light blue) and "Parallel Circuit" (highlighted in light grey). Below these buttons are three input fields: "Resistance" with a unit dropdown set to "Ohms", "Inductance" with a unit dropdown set to "H", and "Capacitance" with a unit dropdown set to "F". A "Calculate" button is positioned below these input fields. At the bottom of the tab, there are two output fields: "Resonant Frequency" and "Q", both highlighted in light green.

Figure 3 -- Resonant Frequency & Q Tab

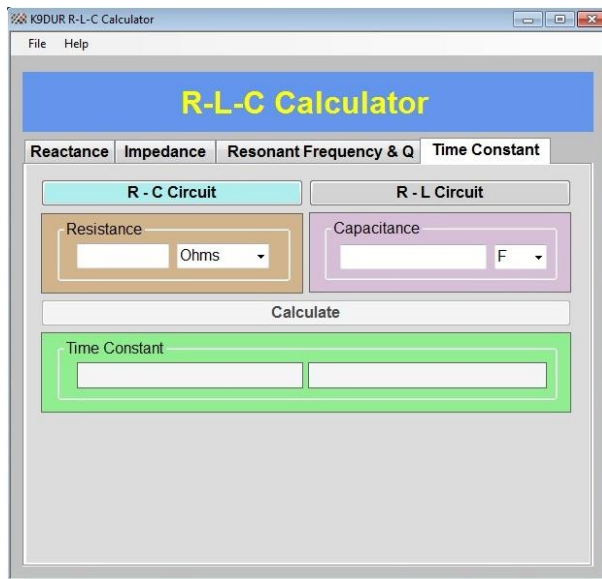
First, you will need to select whether you are calculating the Q of a series circuit or a parallel circuit. A series circuit is selected by default. Click on the **Series Circuit** button to calculate the Q of a series circuit or click on the **Parallel Circuit** button to calculate the Q of a parallel circuit. This will only affect the calculation of the Q. The resonant frequency is the same whether a series circuit or a parallel circuit is selected.

Enter each of the component values & select the units of measurement. If you are calculating the Q of a series circuit, you may leave the resistance blank. However, you must enter a non-zero value for the resistance of a parallel circuit.

When all of the component values have been entered, click on the **Calculate** button to display the resonant frequency and the Q of the circuit.

Calculating Time Constants.

Click on the **Time Constant** tab to calculate the time constant of an R-L circuit or of an R-C circuit. The **Time Constant** tab is shown in **Figure 4**.



The screenshot shows a software window titled "K9DUR R-L-C Calculator". The window has a menu bar with "File" and "Help". Below the menu bar is a blue header with the text "R-L-C Calculator" in yellow. Underneath the header are four tabs: "Reactance", "Impedance", "Resonant Frequency & Q", and "Time Constant". The "Time Constant" tab is selected. Inside this tab, there are two buttons: "R - C Circuit" (highlighted in light blue) and "R - L Circuit" (highlighted in light grey). Below these buttons are two input fields: "Resistance" with a unit dropdown set to "Ohms", and "Capacitance" with a unit dropdown set to "F". Below these fields is a "Calculate" button. At the bottom, there is a "Time Constant" label above two empty input boxes, one of which is highlighted with a green border.

Figure 4 -- Time Constant Tab

First, you will need to select whether you are calculating the time constant of an R-C or of an R-L circuit. An R-C circuit is selected by default. Click on the **R - C Circuit** button to calculate the time constant of an R-C circuit or click on the **R - L Circuit** button to calculate the time constant of an R-L circuit.

Enter each of the component values & select the units of measurement.

When both of the component values have been entered, click on the **Calculate** button to display the time constant of the circuit.

File Menu

Clicking on **FILE** on the menu bar will display the sub-menu shown in **Figure 5**.



Figure 2 -- File Menu

Click on **Exit** or hold the **CTRL** key down and press the "**X**" key to close the program.

Help Menu

Clicking on **HELP** on the menu bar will display the sub-menu shown in **Figure 6**.

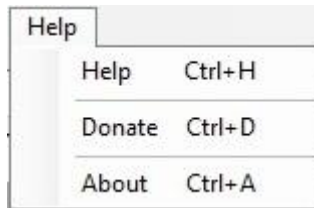


Figure 3 -- Help Menu

Clicking on **Help** or holding the **CTRL** key down and pressing "**H**" will display this document.

Clicking on **Donate** or holding the **CTRL** key down and pressing "**D**" will open a browser window to the donation page on my website.

Clicking on **About** or holding the **CTRL** key down and pressing "**A**" will display a window with basic information about the program. Click on the **Close Window & Continue** button to return to normal operation.

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About the Author

RLCcalc.exe was written by Ray Andrews, K9DUR.

Ray holds an Amateur Extra class license and was first licensed in April 1960. He currently resides in West Terre Haute, IN, and is a retired electronic design engineer and software developer. He operates a small custom software consulting business just to keep him out of mischief between camping trips.

For more information, visit Ray's web pages:

<http://k9dur.info>

<http://www.rnaconsultingservices.com>

Revision History

v2.0..0 – Sep 24, 2011 -- Complete Re-write.

v1.0..0 – Sep 8, 2011 -- Initial release.

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