NovoFormula User's Manual
(Novo Tech Software Ltd.)

Table of Contents

1. Introduction

Software : **NovoFormula**

First Release : January 2011

Licensing Model : [License File](#)

Production Team : Programming: [Alireza Afkhami](#) (M.A.Sc, M.C.P, I.C.D.L, P.Eng)

Similar Programs : [NovoSPT](#)

Updates : [click to open](#)

Disclaimer : [click to read](#)(See 2.)

NovoFormula is designed for correlation / estimation of soil properties. Many correlations and formulas are recommended by geoscientists in order to estimate one soil parameter based on a series of known parameters. For example if you need to estimate consolidation compression index (Cc) instead of searching through several reference books, just run NovoFormula and find the Cc values recommended based on several equations available in NovoFormula database. Please keep your software up-to-date by visiting the program's [web page](#).

Although all efforts have been undertaken to ensure that this software is of the highest possible quality and that the results obtained are correct, the authors do not warrant the functions contained in the program will meet your requirements or that the operation of the program will be uninterrupted or error-free. The authors are not responsible and assume no liability for any results or any use made thereof, nor for any damages or litigation that may result from the use of the software for any purpose. All results to be verified independently by user.

4188 Hoskins Road,
North Vancouver, BC, Canada

2. License Agreement

The Product is Copyright Â© 2008-2012 â€œNOVO TECH SOFTWAREâ€• . You may use it and distribute it according to this following License Agreement. If you do not agree with these terms, please remove the Product from your system. By incorporating the Product in your work or distributing the Product to others you implicitly agree to these license terms.

1.   DEFINITIONS
1.1. "NovoFORMULA" or "Software" refers to â€œNOVO TECH SOFTWAREâ€• â€™s program, in each case, supplied by â€œNOVO TECH SOFTWAREâ€• herewith, and corresponding documentation, associated media, and online or electronic documentation.
1.2. "Trial Versionâ€• means a free version of the Software for personal use only, so identified, to be used in one computer only and for a period of 14 days. The Trial Version is fully functional with no restrictions compared to the registered version.
1.3. "Registered Version" means a version which has been bought from â€œNOVO TECH SOFTWAREâ€• .

2. LIMITATION OF LIABILITY

Although all efforts have been undertaken to ensure that this software is of the highest possible quality and that the results obtained are correct, the authors do not warrant the functions contained in the program will meet your requirements or that the operation of the program will be uninterrupted or error-free. The authors are not responsible and assume no liability for any results or any use made thereof, nor for any damages or litigation that may result from the use of the software for any purpose. All results to be verified independently by user.

In no event shall "NOVO TECH SOFTWARE" be liable for any damages (including, without limitation, lost profits, business interruption, or lost information) rising out of 'Authorized Users' use of or inability to use the NovoFORMULA, even if "NOVO TECH SOFTWARE" has been advised of the possibility of such damages. In no event will "NOVO TECH SOFTWARE" be liable for loss of data or for indirect, special, incidental, consequential (including lost profit), or other damages based in contract, tort or otherwise. "NOVO TECH SOFTWARE" shall have no liability with respect to the content of the NovoFORMULA or any part thereof, including but not limited to errors or omissions contained therein, libel, infringements of rights of publicity, privacy, trademark rights, business interruption, personal injury, loss of privacy, moral rights or the disclosure of confidential information.

3.   FOR   NovoFORMULA   TRIAL   VERSION
(a) The NovoFORMULA Trial version may be freely distributed, with exceptions noted below, provided the distribution package is not modified in ANY WAY.
(b) The NovoFORMULA Trial version may not be distributed inside of any other software package without written permission of â€œNOVO TECH SOFTWAREâ€• .
(c) The NovoFORMULA Trial version allows the user to publish its work according to the license agreement, but nor â€œNOVO TECH SOFTWAREâ€• nor any member of the company can be held liable for the content or accuracy of the publication.
(d) You may use the accompanying Product free of charge for a period of 14 days for the sole purpose of evaluating the Product. If, after this period, you wish to continue using this Product, you are required to purchase it. In other case, you are required to remove this Product, in its entirety, from all computers on which it is installed.
(e) You shall not use, copy, rent, lease, sell, modify, decompile, disassemble, otherwise reverse

engineer, or transfer the Product except as provided in this Agreement. Any such unauthorized use shall result in immediate and automatic termination of this Agreement.

4.   FOR   NovoFORMULA   REGISTERED   VERSION
(a) You may install and use the Software on a single computer; OR install and store the Software on a storage device, such as a network server, used only to install the Software on your other computers over an internal network, provided you have a license for each separate computer on which the Software is installed and run. A license for the Software may not be shared, installed or used   concurrently   on   different   computers.
(b) The NovoFORMULA Registered version allows the registered user to publish its work according to the license agreement, but nor â€œNOVO TECH SOFTWAREâ€• nor any member of the company can   be   held   liable   for   the   content   or   accuracy   of   the   publication.
(c) The NovoFORMULA Registered version guaranties to the registered user free updates for a whole version   cycle   and   for   12   (twelve)   months.
(d) You shall not use, copy, rent, lease, sell, modify, decompile, disassemble, otherwise reverse engineer, or transfer the Product except as provided in this Agreement. Any such unauthorized use shall   result   in   immediate   and   automatic   termination   of   this   Agreement.
(e) Once purchased, the Software may not be return to "NOVO TECH SOFTWARE". The price paid for the   Software   is   not   refundable.
(f) The NovoFORMULA license is issued for one computer based on the Hardware ID provided by user. Each transfer of license to another computer, if approved by NOVO TECH SOFTWARE, will be subject   to   20   percent   charge   based   on   latest   NovoFORMULA   price.

5.   TERMS
This license is effective until terminated. You may terminate it by destroying the program, the documentation and copies thereof. This license will also terminate if you fail to comply with any terms or conditions of this agreement. You agree upon such termination to destroy all copies of the program   and   of   the   documentation,   or   return   them   to   the   author.

6.   OTHER   RIGHTS   AND   RESTRICTIONS
All other rights and restrictions not specifically granted in this license are reserved by "NOVO TECH SOFTWARE". If you have any questions regarding this agreement, please write to support@NovoTechSoftware.com

YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS.

3. Contents

3.1 Using Help

Help button is placed at the top-right corner of all *NovoFormula* pages, as shown on this screenshot. This button will show the help contents of each page when clicked.
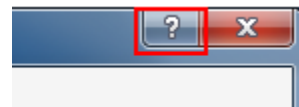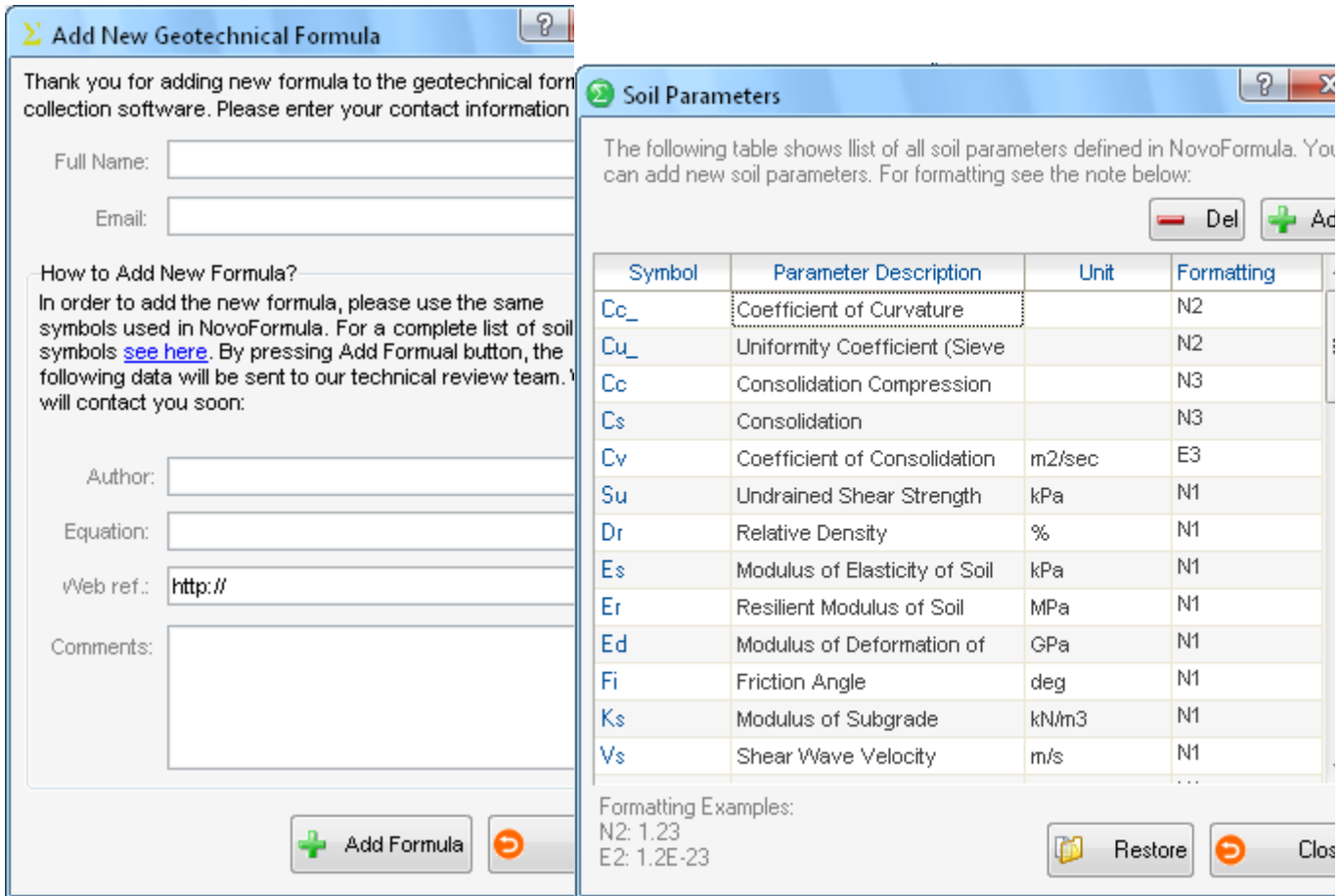
3.2 Preferences

Use this page to choose the user interface language.

3.3 Adding more equations

More than 140 equations are implemented in this version of NovoFormula. However, its database is expandable and can grow by adding new equations. User can add new formula by clicking on
Tools ▸ Add New Formula menu. This will show the screenshot on the left below:

In order to add an equation, NovoFOrmula's standard parameters should be used. For example the equation $\gamma_w = \gamma_d(1+w)$ defines the relation between bulk and dry density using moisture content. This equation is stored as gwet= in NovoFormula's database. A list of soil parameters defined in NovoFormula can be accessed via View ▸ List of Soil Parameters menu, also listed below:

Symbol	Description	Unit	Format
Cc_	Coefficient of Curvature (Sieve Test)		N2
Cu_	Uniformity Coefficient (Sieve Test)		N2
Cc	Consolidation Compression Index		N3
Cs	Consolidation Recompression Index		N3
Cv	Coefficient of Consolidation	m2/sec	E3
Su	Undrained Shear Strength	kPa	N1
Dr	Relative Density	%	N1

Es	Modulus of Elasticity of Soil	kPa	N1
Er	Resilient Modulus of Soil	MPa	N1
Ed	Modulus of Deformation of Rock	GPa	N1
Phi	Friction Angle	deg	N1
Ks	Modulus of Subgrade Reaction	kN/m3	N1
Vs	Shear Wave Velocity	m/s	N1
Gmax	Shear Modulus	kPa	N1
mv	Constraint Modulus	1/kPa	E3
LL	Liquid Limit	%	N1
PL	Plastic Limit	%	N1
IP	Plastic Index	%	N1
LI	Liquid Index	%	N1
w	Moisture Content	%	N1
mu	Poisson Ratio		N2
e	Void Ratio		N2
Gs	Specific Gravity		N2
gsat	Saturated Unit Weight	kN/m3	N2
gdry	Dry Unit Weight	kN/m3	N2
gwet	Wet Unit Weight	kN/m3	N2
F	Percent fine-grained (clay & silt)	%	N1
Fc	Percent clay	%	N1
OCR	Overconsolidation Ratio		N2
Svt	Total Overburden Stress	kPa	N2
Sve	Effective Overburden Stress	kPa	N2
K	Coefficient of Permeability	cm/sec	E3
D10	Effective Particle Diameter	mm	N3
D30	30% Passing Diameter	mm	N3

D50	Mean Particle Diameter	mm	N3
D60	60% Passing Diameter	mm	N3
CBRs	Subgrade CBR	%	N2
CBRb	Base Course CBR	%	N2
Pc	Preconsolidation Stress	kPa	N2
S	Degree of Saturation	%	N1
n	Porosity		N2
Mv	Coefficient of Compressibility		E3
Ka	Coeff. of Active Earth Pressure		N3
Kp	Coeff. of Passive Earth Pressure		N3
Ko	Coeff. of At-rest Earth Pressure		N3
KD	Dilatometer Parameter		N2
RMR	Rock Mass Rating	%	N1
Tv	Time Factor-Consolidation		N3
Hdr	Drainage Thickness of the Layer-Consolidation	m	N2
t	Time	sec	N1
U	Degree of Saturation	%	N1
Ac	Clay Activity		N1
Sp	Swelling Potential		N1

3.4 Data Entry

3.4.1 Toolbar & Menu

Most of the commonly used commands in NovoFormula are placed in toolbars. For other commands use menu bar.
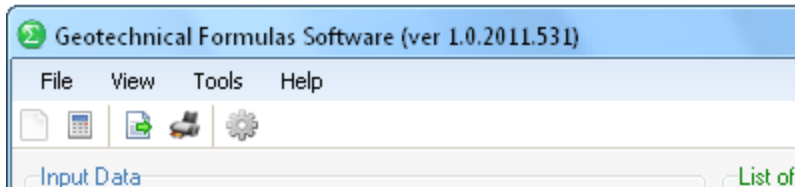
3.4.2 Getting Started

In order to start a new analysis, press New button from the top toolbar(See 3.4.1) or choose File ▸ New menu. The main steps of correlation analysis are described below:

1. Choose the target soil parameter

What soil parameter you are looking for? NovoFormula provides you with a list of soil properties which can be estimated based on other parameters (see #1 in the screenshot above).

2. Enter soil parameters

Depending on the chosen target parameter, the table at the bottom-left portion of the page will be populated with the list of the required soil parameters. If the value of all these parameters are entered, then all available correlation for the target soil parameter will be provided to you. However, in most cases we just have some of these soil properties; this will cause part of the correlations be presented. As you enter soil parameters (see #2 in the screenshot), the list of formulas (#3) is updated with more equations.

3. Review the results

Once you are done with data entry, review the list of correlations(See 3.5.1) (see #3 on screenshot). By clicking on each row, additional comments and the actual equation are presented below the table. Based on these comments you may want to remove some of the results from the list by un-checking the box to the left of each row (for example the equation might have been derived for another soil type or geographical location, etc). Once you remove an equation from the list, the average of correlated values will be updated.

By clicking on "Distribution Chart(See 3.5.2)" button, will show a chart containing all correlated values in a chart.

3.4.3 Enter known properties

In order to obtain the results, value of soil parameters should be entered in the table as shown below:
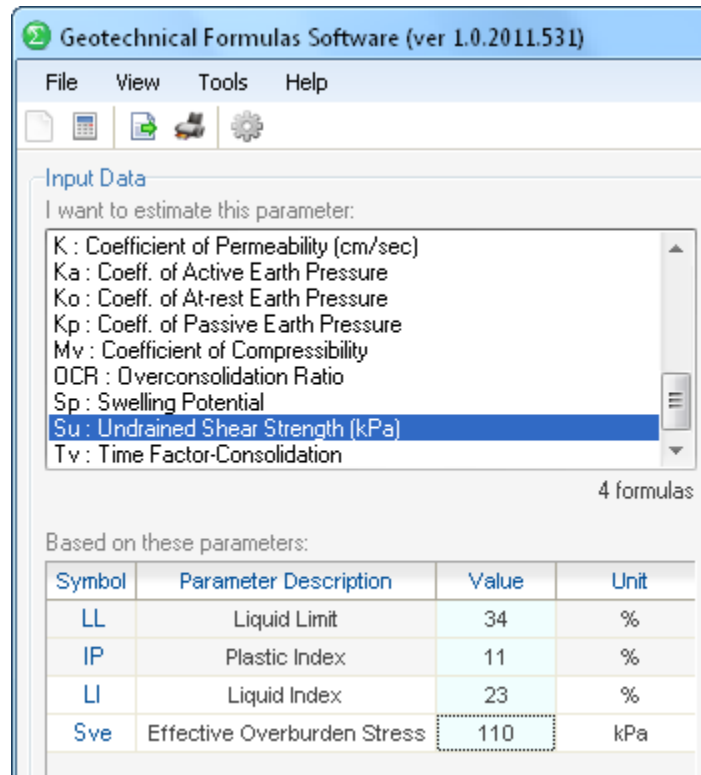
Most of the times, part of the input parameters are enough to provide at least one result(See 3.5.1); however in order to have the results for all the available equations, all the listed soil parameters should be given tot he program. As parameters are entered, results will be updated.

3.4.4 Units System

Currently NovoFormula supports Metric units.

3.5 Results

3.5.1 List of Correlated Values

Once you are done with data entry, review the list of correlations (see screenshot below). By clicking on each row, additional comments and the actual equation are presented below the table. Based on these comments you may want to remove some of the results from the list by un-checking the box

to the left of each row (for example the equation might have been derived for another soil type or geographical location, etc).

Once you remove an equation from the list, the "Average value" of the correlations will be updated.
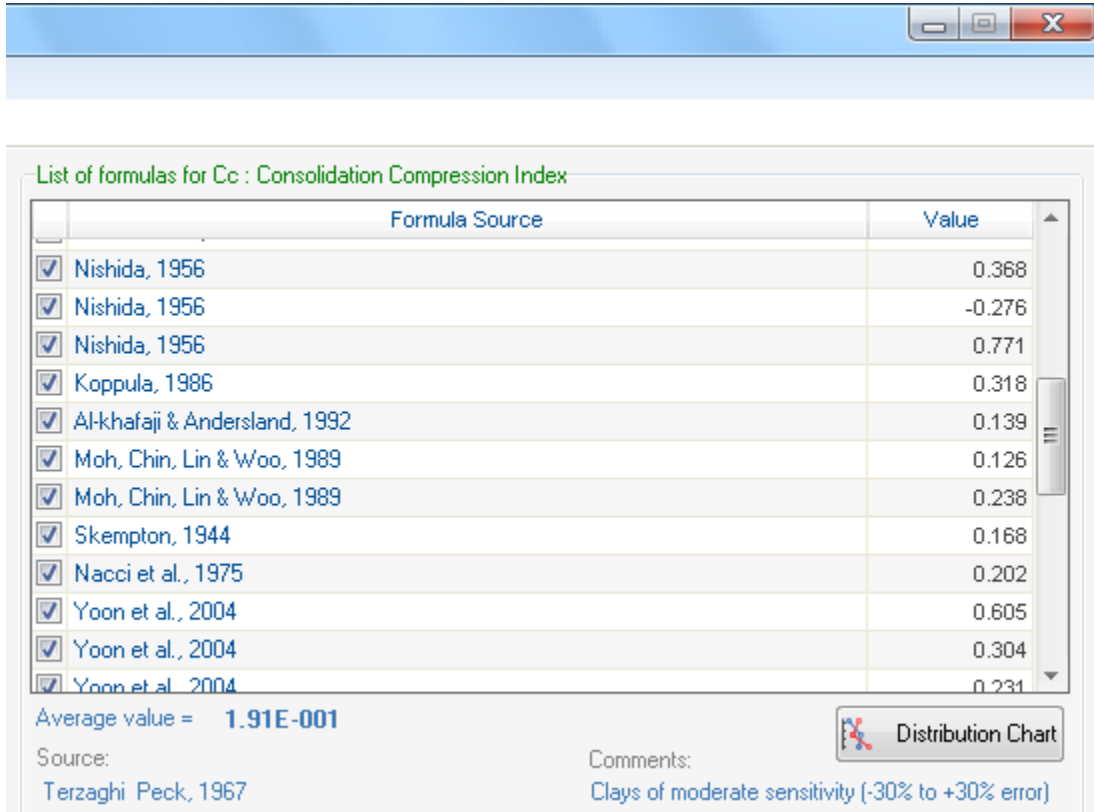
How to export the table into Microsoft Excel

Click on the ⬇ File ▸ Export menu. Then choose the file name and path in the dialog and the table/chart will be saved as an Excel file.

Visualization of correlated values

To better visualize the results of correlations, click on Distribution Chart(See 3.5.2) button. A new page will show a scatter chart for the results which helps user comparing the correlated values and picking the most reasonable range for the soil parameter. In order to view additional information, move the mouse over each point on the graph.

3.5.2 Distribution Chart

A distribution chart, summarizes all correlated values obtained from several available equations on the same chart. This allows user to get a reasonable understanding of distribution of results. For example, as it can be seen on this screenshot, the Cc values generally vary between 0.1 for 0.2 for the specific input data provided to the program.
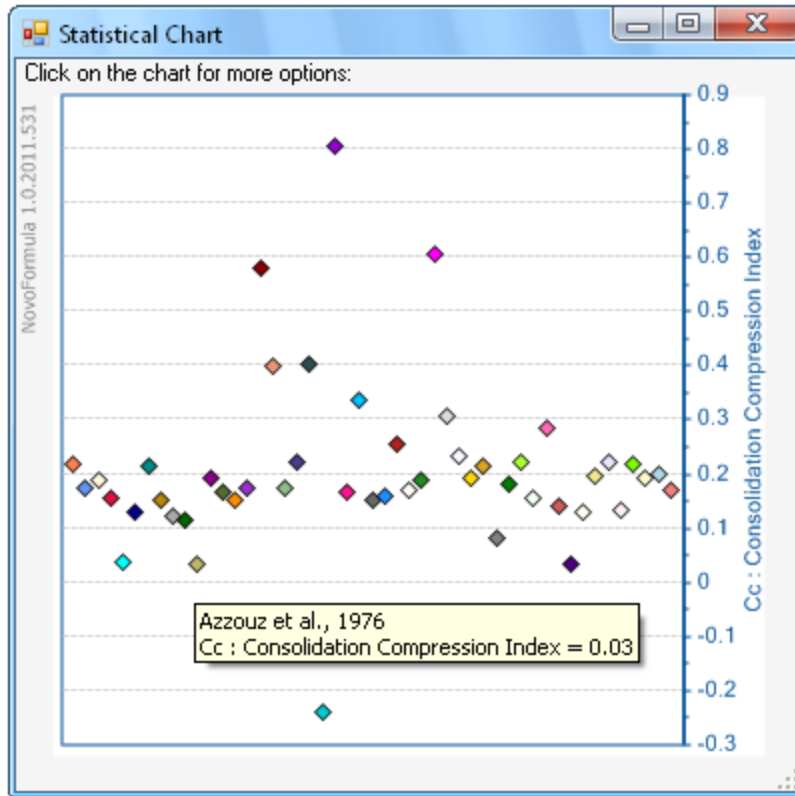
In order to get the source (name of geoscientist) of each point, simply move the mouse over the point.

3.5.3 Working with Equations

By clicking on each row on the correlated parameters(See 3.5.1), its equation will be presented at the bottom-right portion of the page. If you click on this equation, another page (see below) will appear with more feature such as saving and printing the equation.

You can contact us and share your comments on this equation by clicking on 🔵 Discuss button.

3.5.4 Reporting

By pressing Print button all correlated results will be summarized in the report. The print preview page allows user change the page setup, print the report, save as PDF, zoom on the report, etc. Toolbar buttons are described in the screenshot below:

3.5.5 Exporting Results

3.5.5.1 Graph Presentation Tool

We understand that presentation of the analysis results is very important to our users. Everywhere in Novo Tech Software programs when you click on a chart, a new dialog appears containing the chart and its associated data. In the following example, the corresponding dataset is shown on right and can be scrolled horizontally and vertically to view all data. In addition, toolbar buttons provide you with more features:
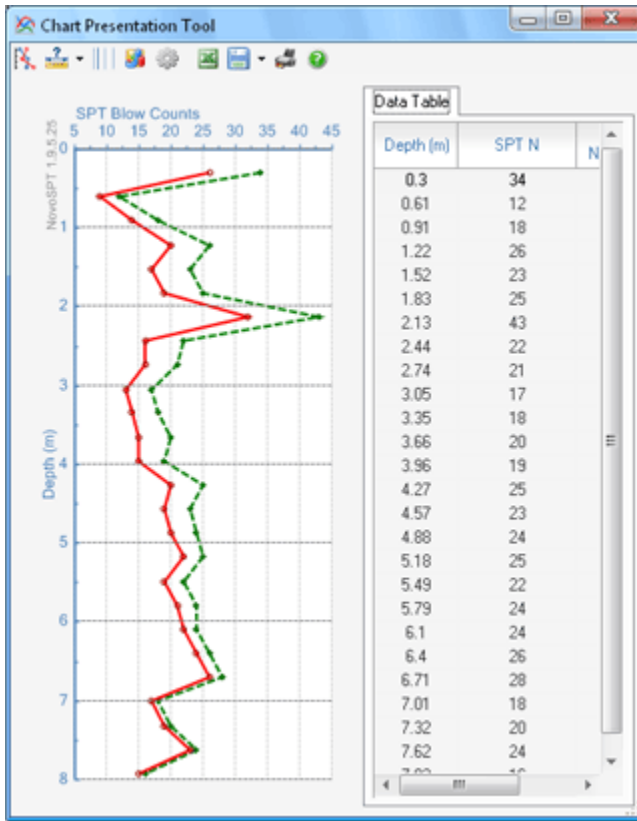
To change line styles of the plot

To change the scale (minimum, maximum and gridlines) of each axis. Please click on small arrow on right side of the icon to open the dropdown menu

To toggle between normal/logarithmic scale for horizontal axis

To change the chart type

To open the advanced settings page for the chart

To save the dataset table as Microsoft Excel file

To save the chart as text and graphic format

To print the chart

Opens this help page

How can I change the appearance of the chart such as legend, chart type, etc?

You can configure almost everything in the chart by clicking on button from the toolbar. This will open the following dialog box:
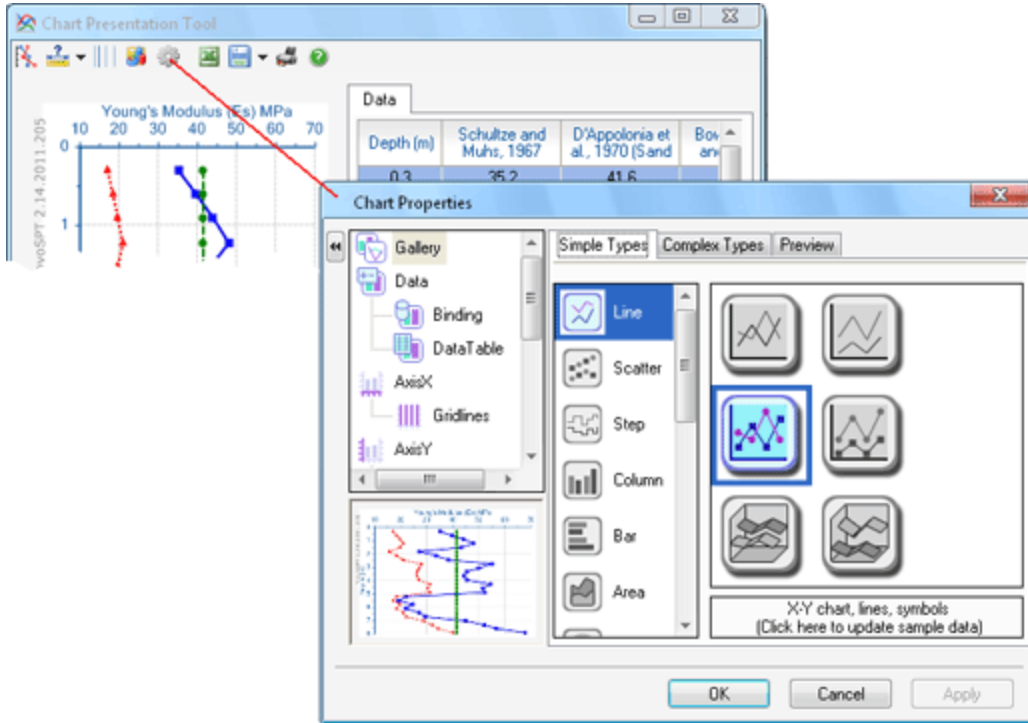
Click on the desired element from the list located on the left side of the page; more options will be shown on the right portion. Click on OK button to apply your changes.

3.5.5.2 Exporting Tables and Graphs

Most of the users have already setup their spreadsheets and would rather keep their reports in the same format. To do this, they need to export the analysis results into other popular formats such as Microsoft Excel.

To export the results click on button form toolbar. A dialog similar to the following screenshot will appear. List of all tables and charts of the analysis results, will be provided on left and right panels, respectively (see below).
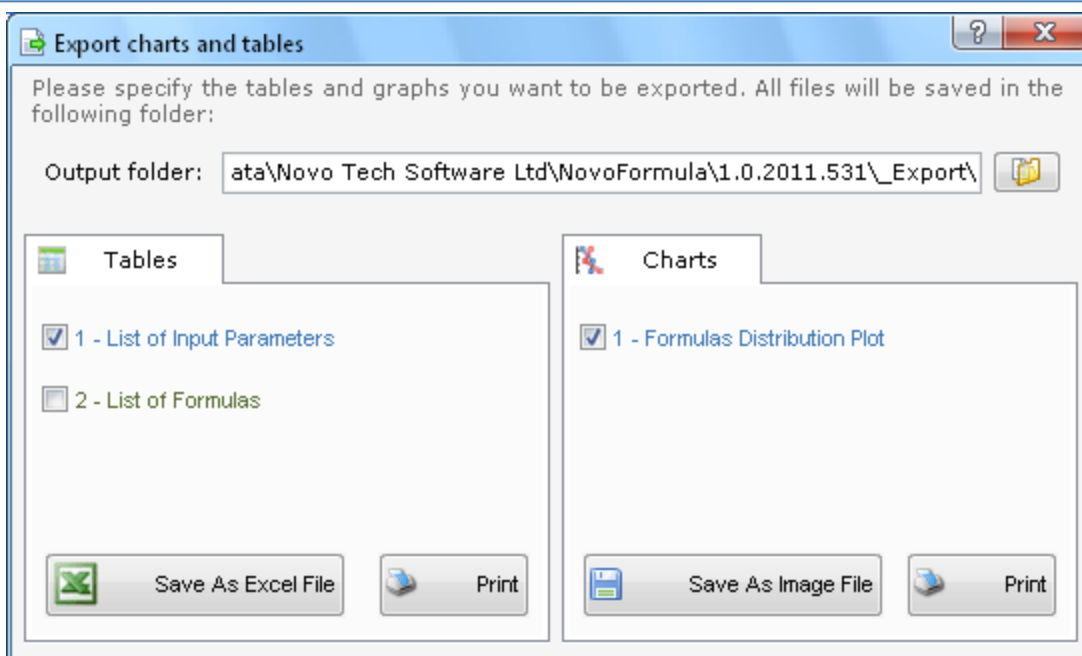
Please specify the output folder (You can change this folder by clicking on ... button). Then select the items you want to export.

Exporting Data Tables
Tables can be saved as Microsoft Excel or may be directly sent to the printer.

Exporting Graphs (Charts)
All charts may be saved with image formats such as BMP, PNG, JPG, etc or be printed.

4. Online

4.1 Novo Tech Software website
http://www.novotechsoftware.com

4.2 Our other programs
http://www.novotechsoftware.com/products/

4.3 Updates
http://www.novotechsoftware.com/updatelogs/novoformula.txt

4.4 Contact us
http://www.novolab2.com/web forms/contact.php