
Wehrspohn GmbH Co. KG

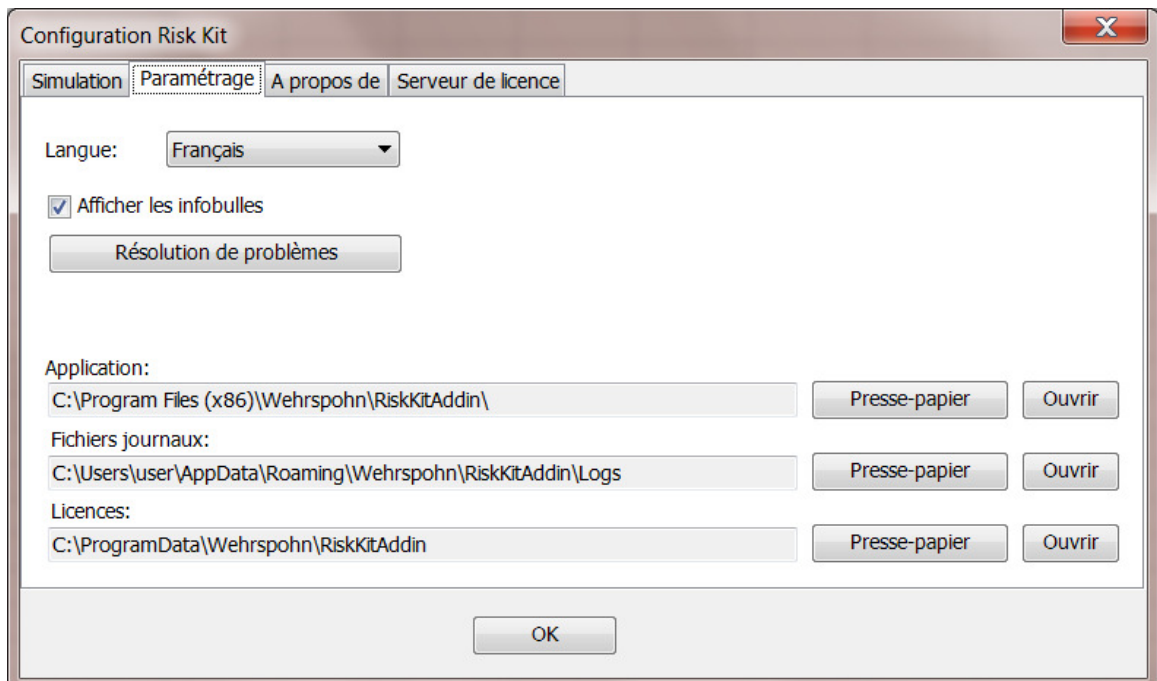
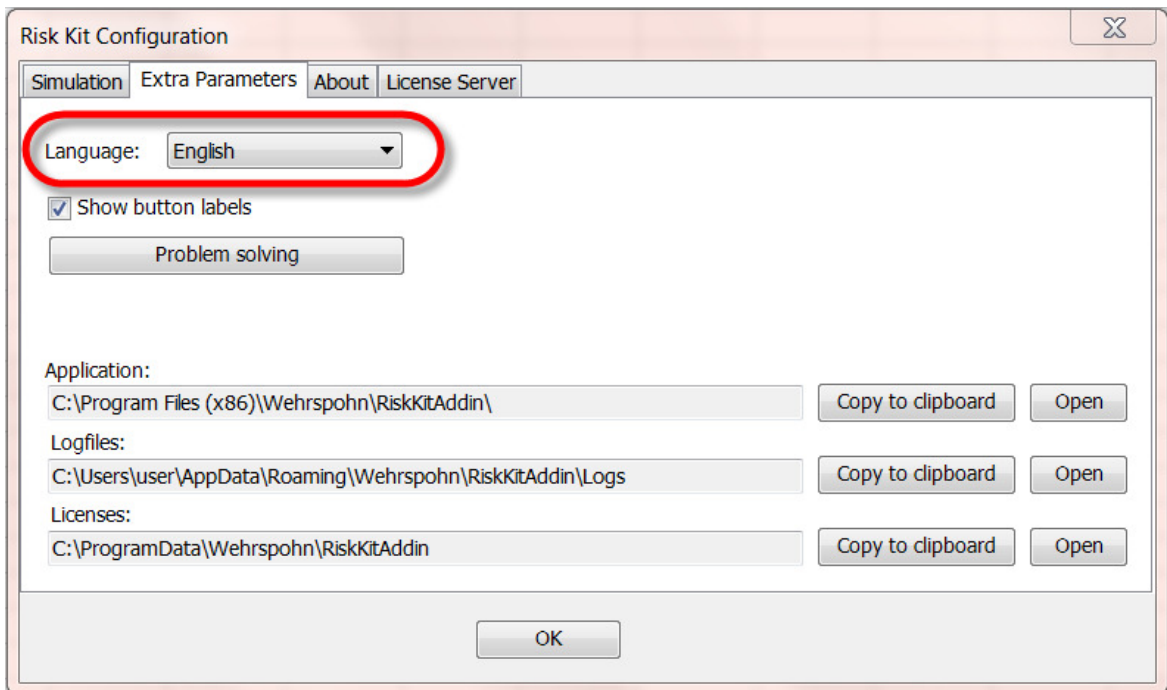
Wehrspohn Risk Kit
Risk Kit 3.0. New Features

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1. French localization

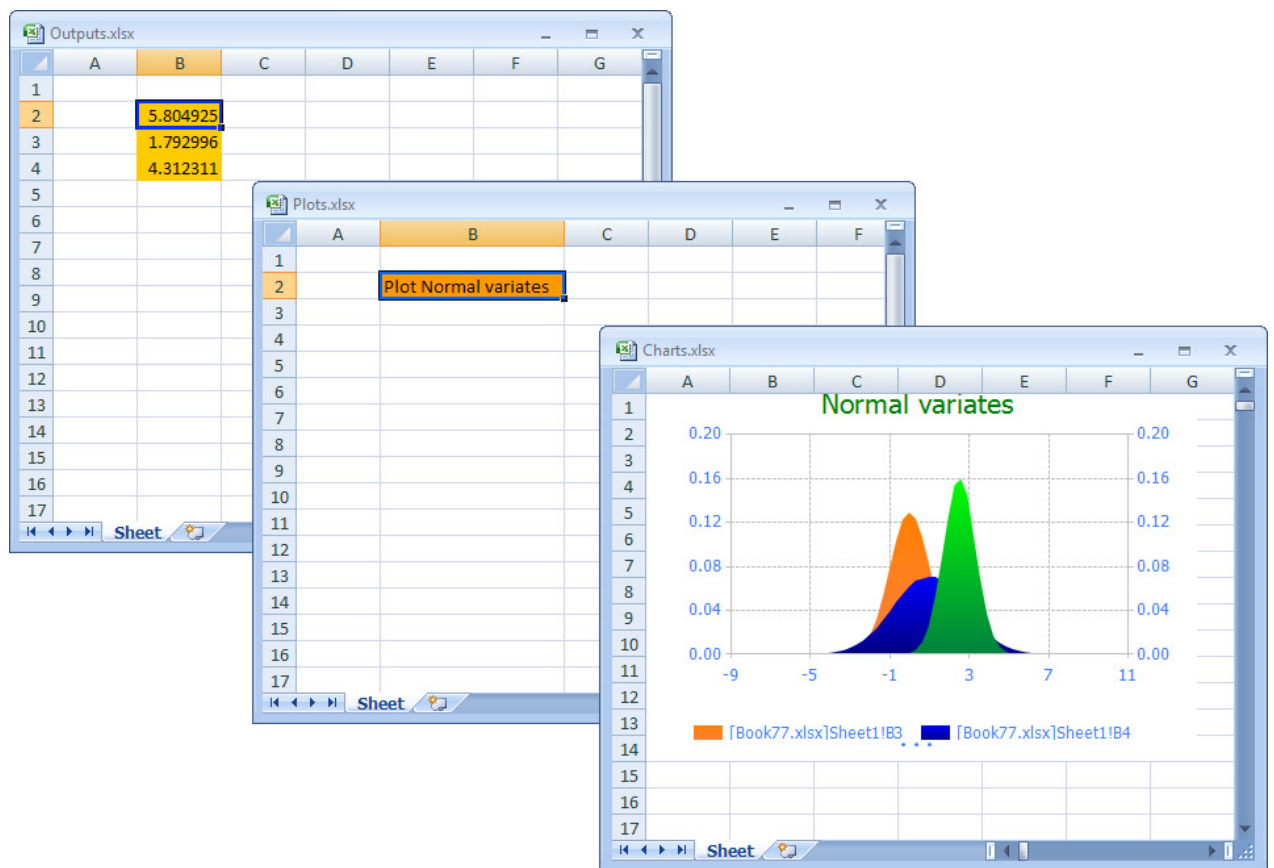
With version 3.0 Risk Kit is available with a full French localization. The software itself is international. You can change the language at runtime via the config dialog on tab 'Extra Parameters'. Choose your language from the combo box. Currently available languages are English, French and German.



2. References between worksheets (workbooks)

Risk Kit 3.0 allows references between different worksheets (workbooks). So now it is possible to have inputs, outputs, plots and charts on different worksheets (workbooks).

The image below contains an example of such approach.



The "Outputs" workbook contains cells marked as "Risk Kit Output". The "Plots" workbook contains plot function which uses output cells from the "Outputs" workbook as a parameter. Here is the plot function which is used in this example:

```
=Plot([Outputs.xlsx]Sheet!B2:B4, , "Normal variates", "x", "y", [Charts.xlsx]Sheet!A1, "HISTOGRAM", 400, 300)
```

[Outputs.xlsx]Sheet!B2:B4 – Output cells from the Outputs.xlsx workbook. These cells should be marked as Risk Kit Output Cells;

[Charts.xlsx]Sheet!A1 – Cell where the chart will be embedded. It references to the Charts.xlsx workbook which is used as a cockpit for embedded charts.

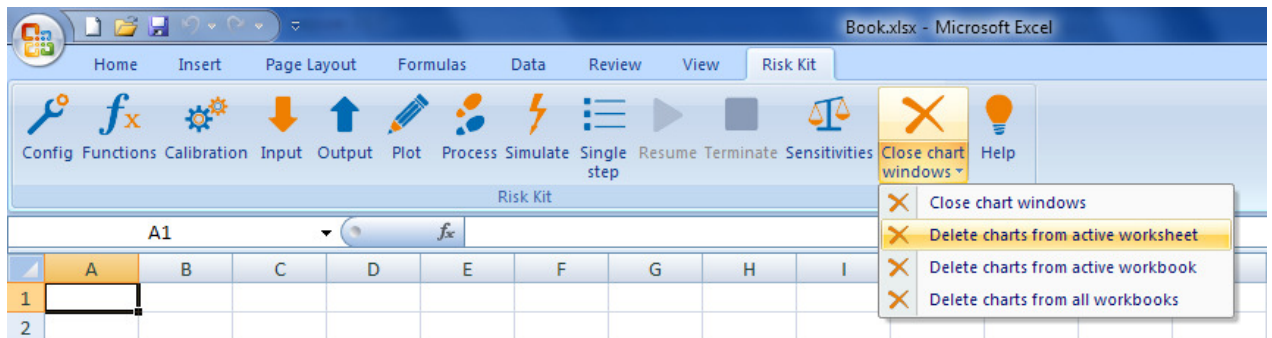
To use this approach, it is necessary to use “Simulate the active workbook” mode if data is located on different worksheets of the active workbook, or “Simulate all open workbooks” mode if data is located on different workbooks.

The PlotProcess function also may refer to other worksheets (workbooks).

All embedded charts are replaced with new ones automatically after resimulation.

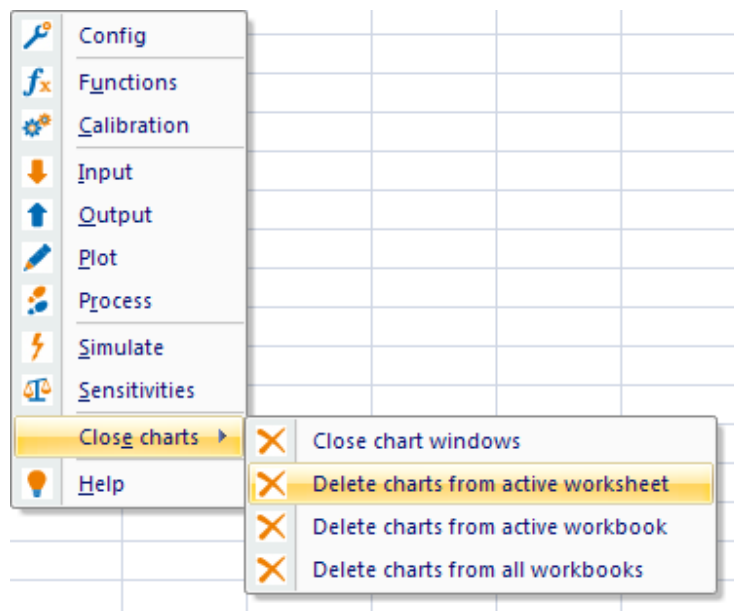
3. Deleting embedded charts from active worksheet/workbook(s)

Risk Kit 3.0 allows deleting embedded charts from the active worksheet, active workbook and all open workbooks independently. Now for deleting embedded charts just click the specific menu item from the drop down menu:



By default the drop down button closes all chart windows. The drop down menu includes this option as well.

In addition, these options are available in main menu and context menu:

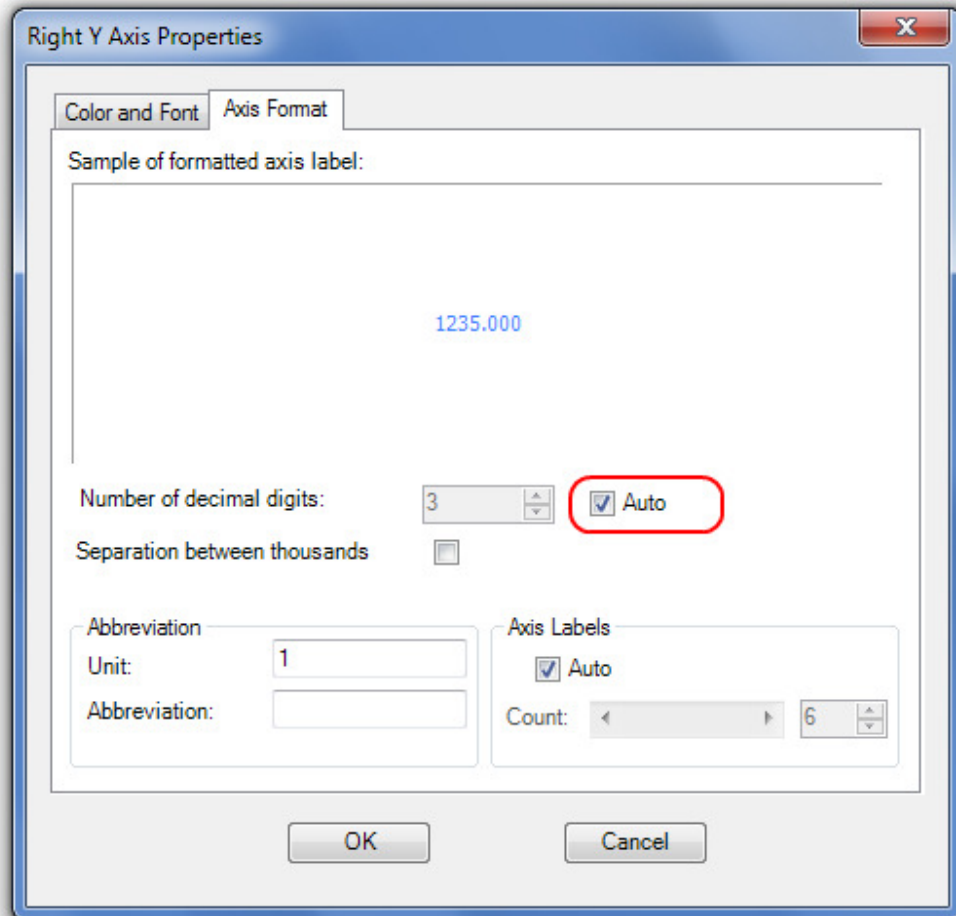


Risk Kit 3.0 deletes charts which have been created by Risk Kit independently. All other charts are not deleted.

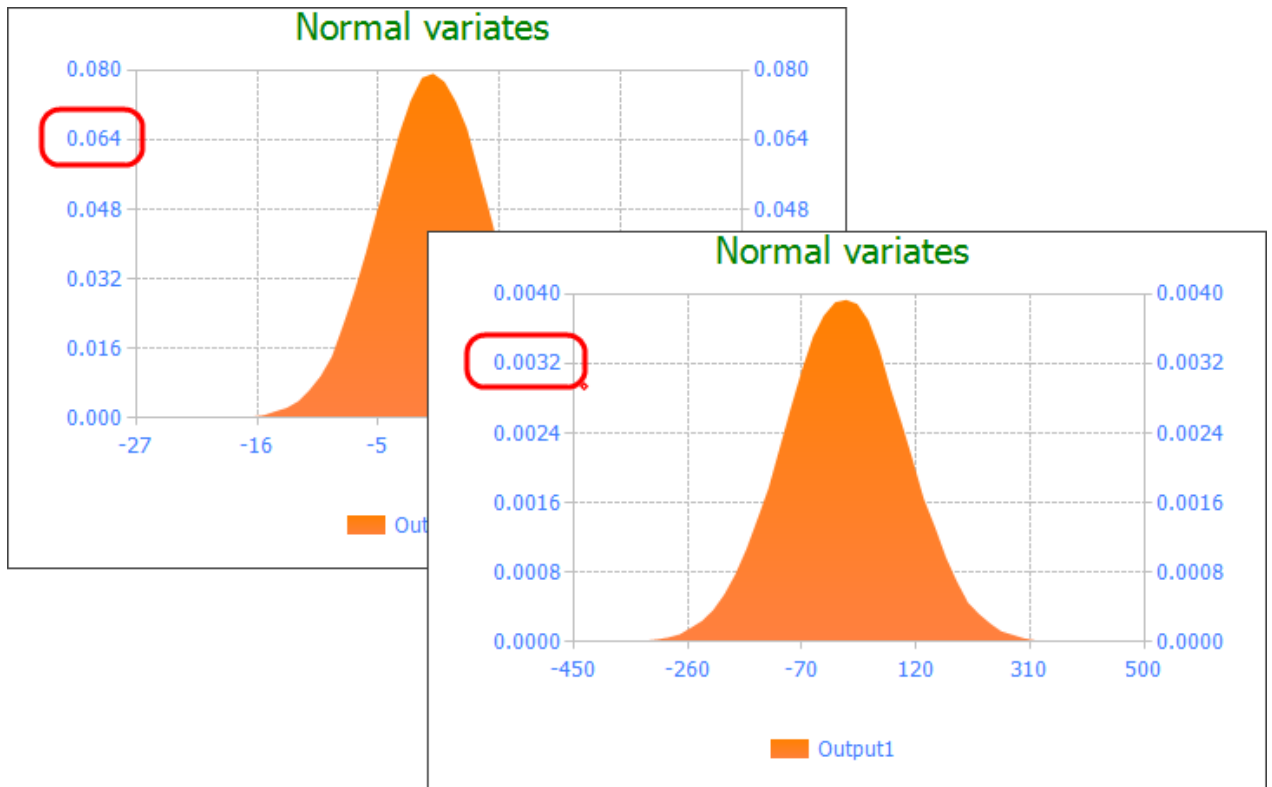
4. Auto format of axes

Risk Kit 3.0 includes new option for formatting axes. Now it is possible to use auto formatting for axes. In this case number of decimal digits for the Y and X axes will be set automatically depending on the scale.

To enable this option select the “Auto” checkbox in the “Axis Properties” window.



The image below displays an example of auto formatting.



Risk Kit uses three decimal digits for the Y-Axis of the first chart, but it uses four decimal digits for the second one.

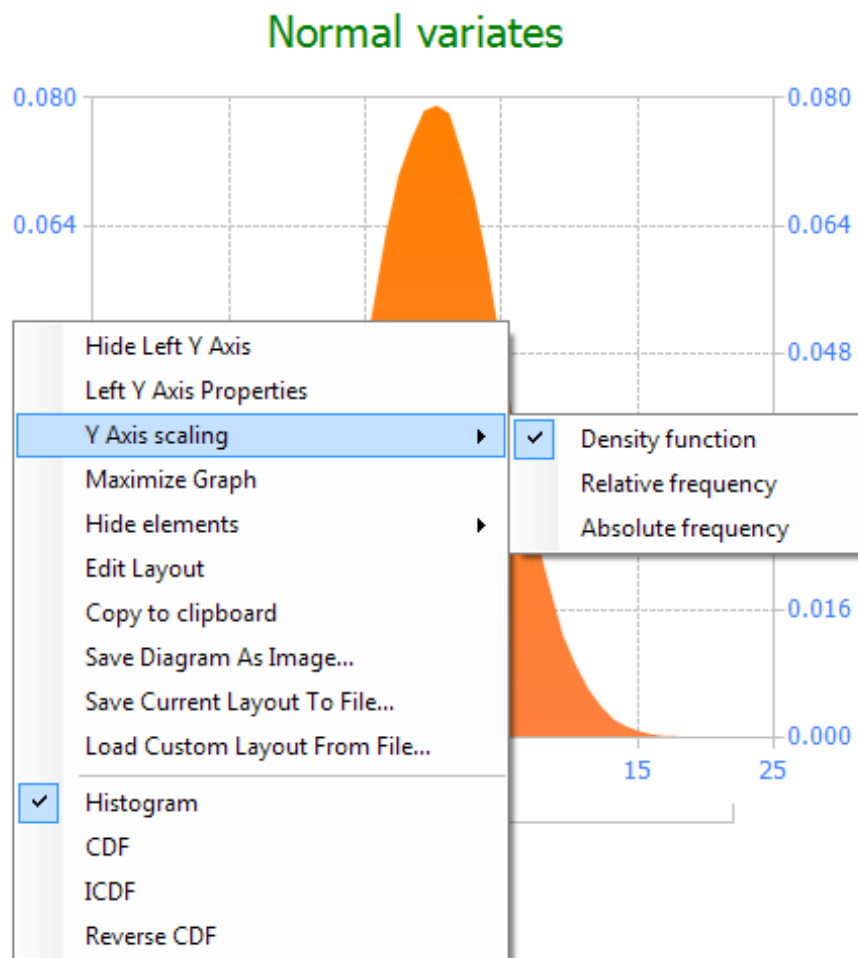
If this option is disabled, Risk Kit 3.0 uses the number of decimal digits which was defined in the “Axis Properties” window.

5. Y-Axis scaling

Risk Kit 3.0 implements three different options for scaling the Y-axis:

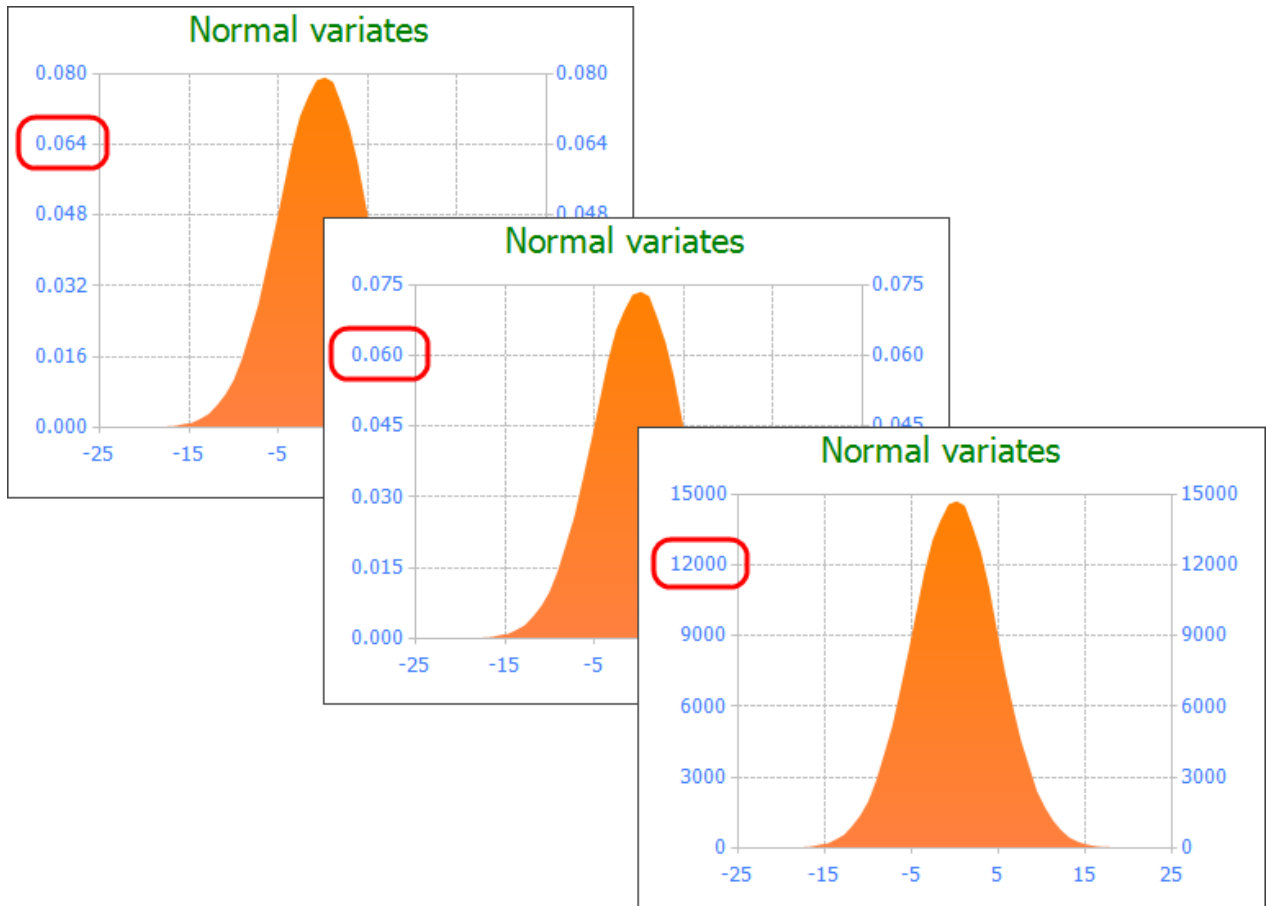
1. Density function - the vertical axis is scaled so that the area of the histogram equals 1;
2. Relative frequency - the vertical axis is scaled to show the relative frequency of the realizations within a bar of the histogram;
3. Absolute frequency - the vertical axis is scaled to show the number of simulation results within a bar of the histogram;

These options are available from the context menu of the Y-axis:



The image below contains the same chart which uses three different scaling options respectively:

1. Density function;
2. Relative frequency;
3. Absolute frequency;

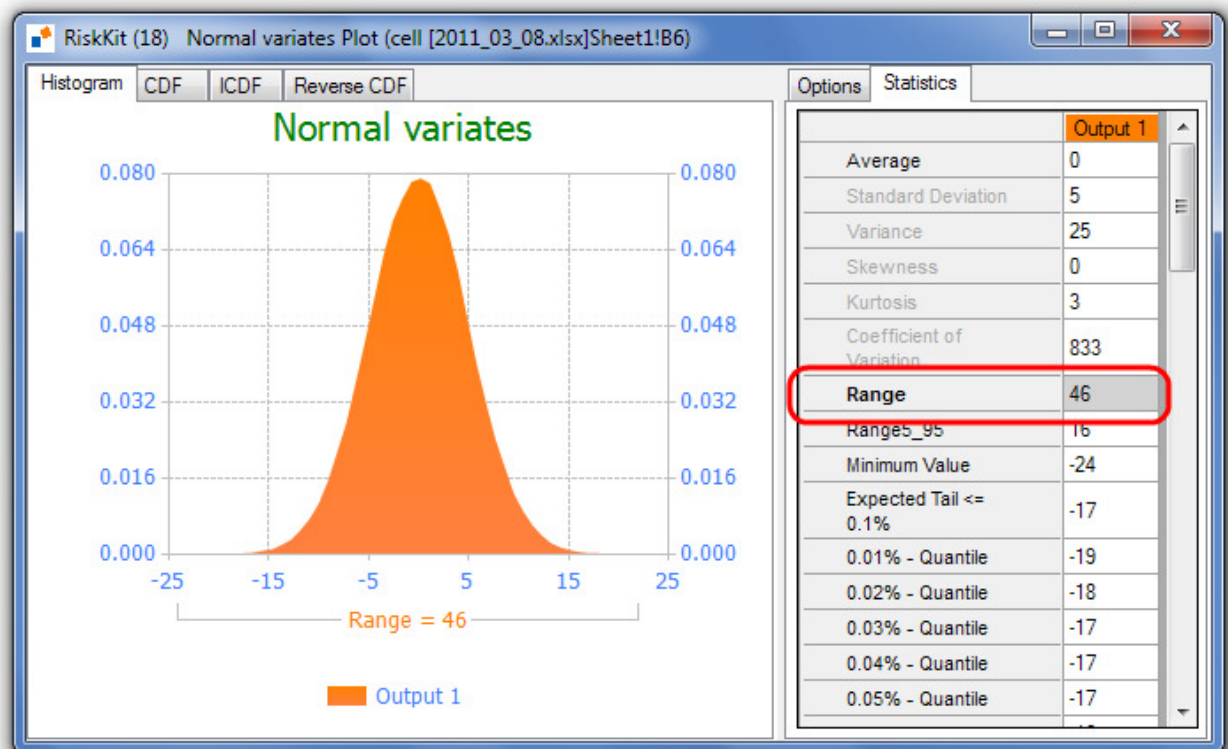


All of these charts have the same view, but the Y-Axis has different scales.

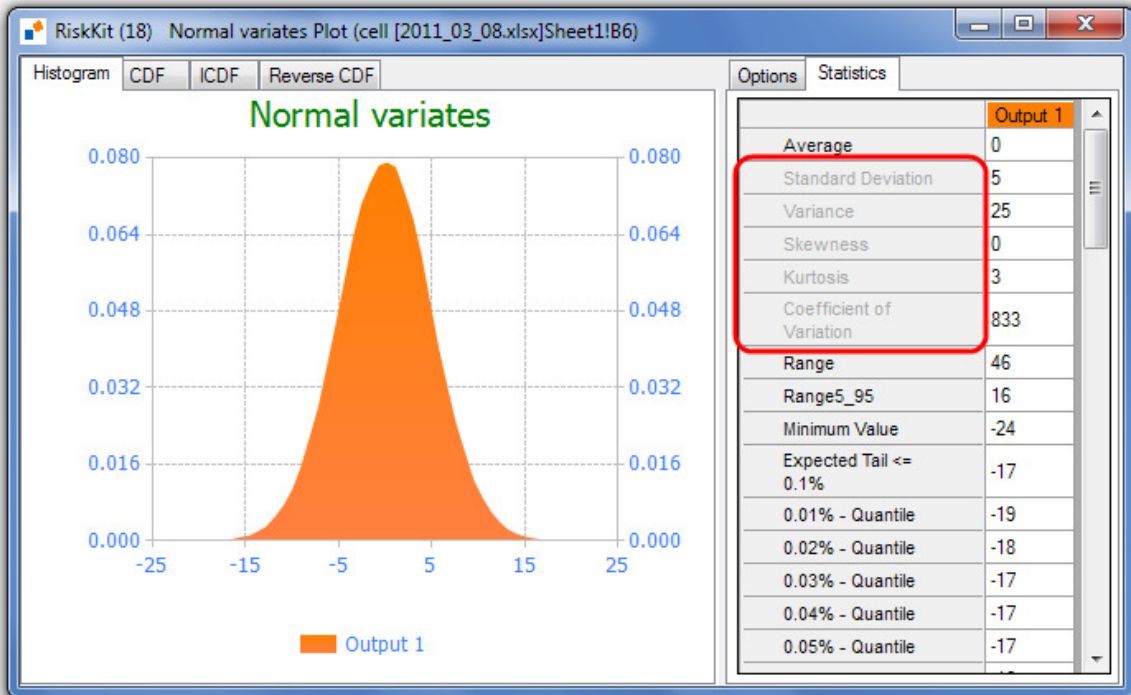
6. Improvements of the Statistics tab

The “Statistics” tab page was improved in Risk Kit 3.0.

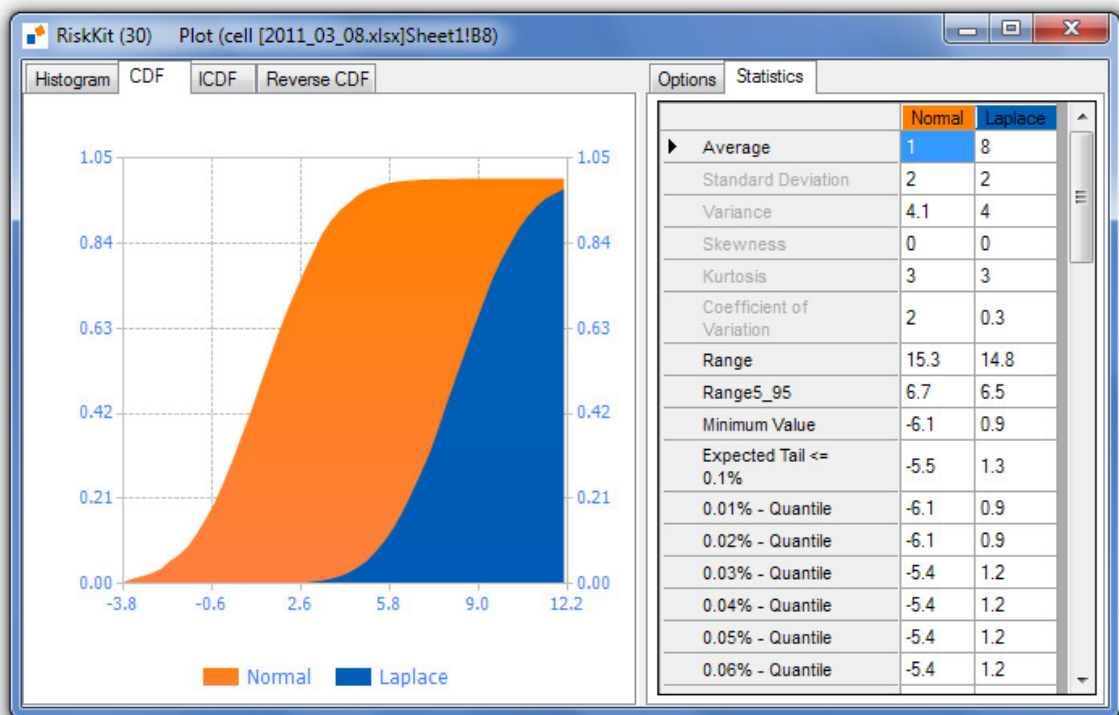
If some kind of statistics are selected for all series, the row header becomes bold.



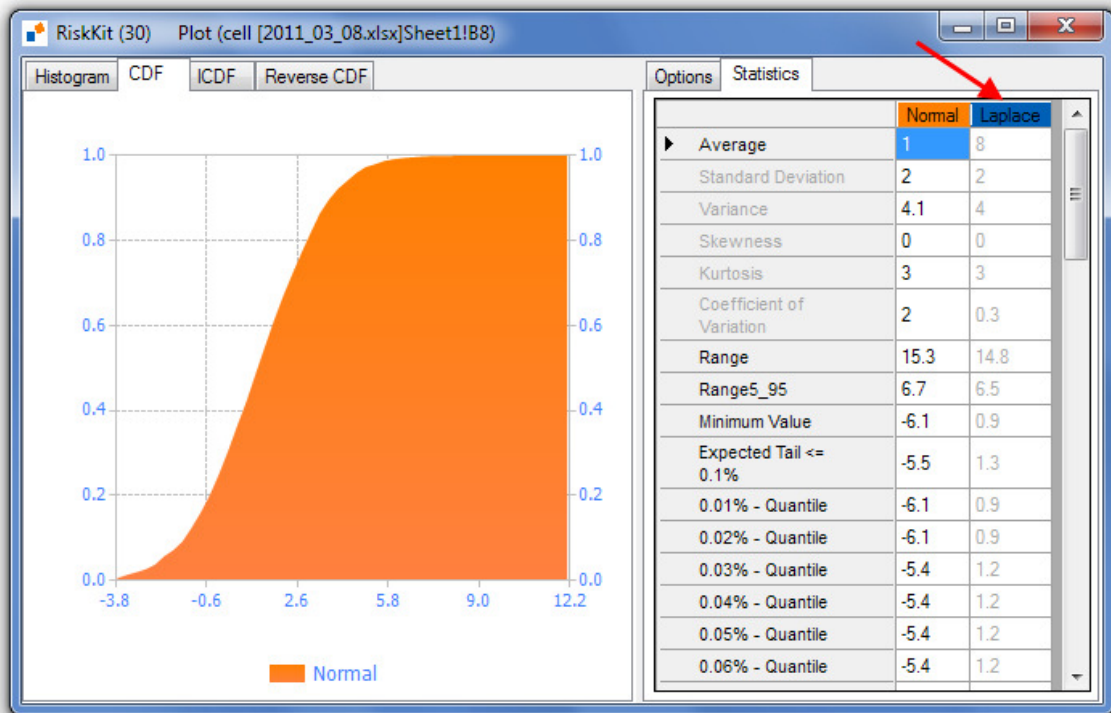
The “Statistics” grid contains parameters that can’t be shown on the chart. These parameters are highlighted with gray.



Also Risk Kit 3.0 allows showing or hiding series on the chart. The image below displays chart which consists of two series.

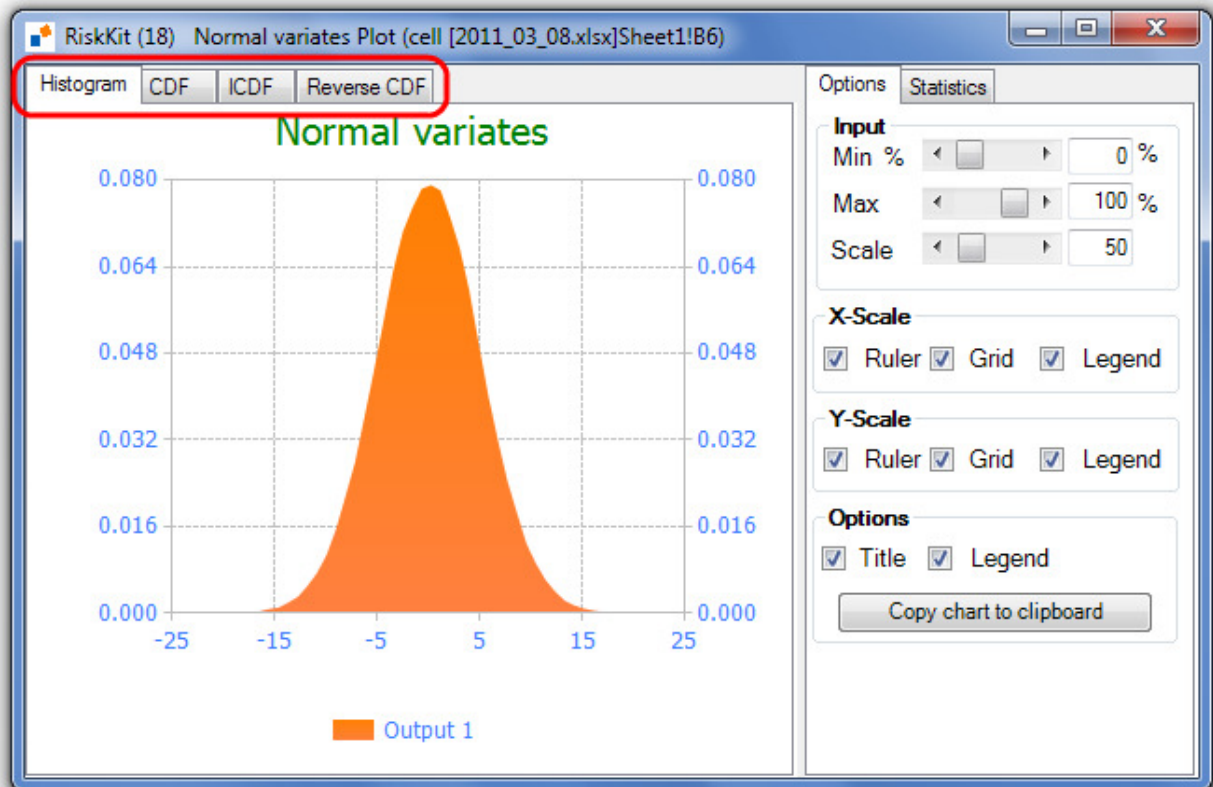


Double click on series column allows showing/hiding this series. Hidden series are highlighted with gray in the “Statistics” grid. The following image displays the “Normal” series. The “Laplace” series was hidden.

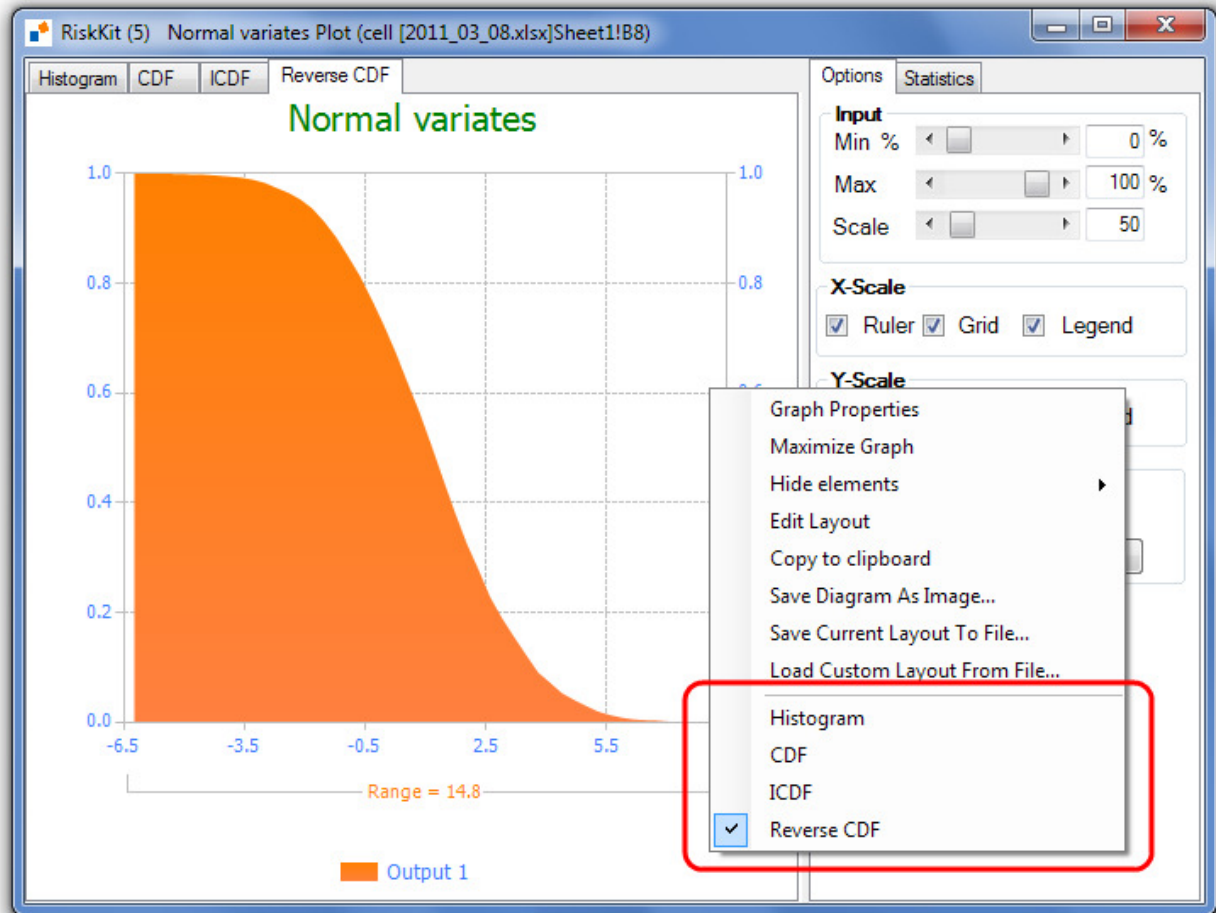


7. Histogram, CDF, ICDF, Reverse CDF are on different tabs

Risk Kit 3.0 displays different chart types on different tab pages. You can switch between tabs by clicking the specific tab page.



You can also use CTRL+D or the context menu for switching between tabs.



8. Continuous custom distribution

Risk Kit 3.0 includes a new UDF function ContCustom which implements a continuous custom distribution. This distribution is the continuous counterpart of the discrete multinomial distribution. It is defined by values v_i with relative densities $d_i, i = 1, \dots, n$. Between v_i and v_{i+1} the relative density is the linear interpolation of d_i and d_{i+1} . Below v_0 and above v_n the relative density is 0. The values v_i need to be stated in increasing order. The relative densities d_i need to be non-negative ($d_i \geq 0$).

Syntax

ContCustom(type, values, densities, [x], [TruncLow], [TruncHigh])

Parameters

The following table describes parameters of this function:

Parameter	Example	Description
Type	0	A function type. This parameter may have one of the following values: 0 – Probability density or probability mass function (PDF or PMF); 1 – Cumulative distribution function (CDF); 2 – Inverse cumulative distribution function (ICDF); 3 – Variates.
Values	C7:D16	Vector of values
Densities	D7:D16	Vector of relative densities
X	C11	<i>Optional.</i> Represents argument x. This parameter should be either a range or a number
TruncLow	0	<i>Optional.</i> A function will be truncated below this value. This parameter should be either a range or a number
TruncHigh	10	<i>Optional.</i> A function will be truncated above this value. This parameter should be either a range or a number

The function returns PDF, CDF, ICDF or variates of the continuous custom distribution.

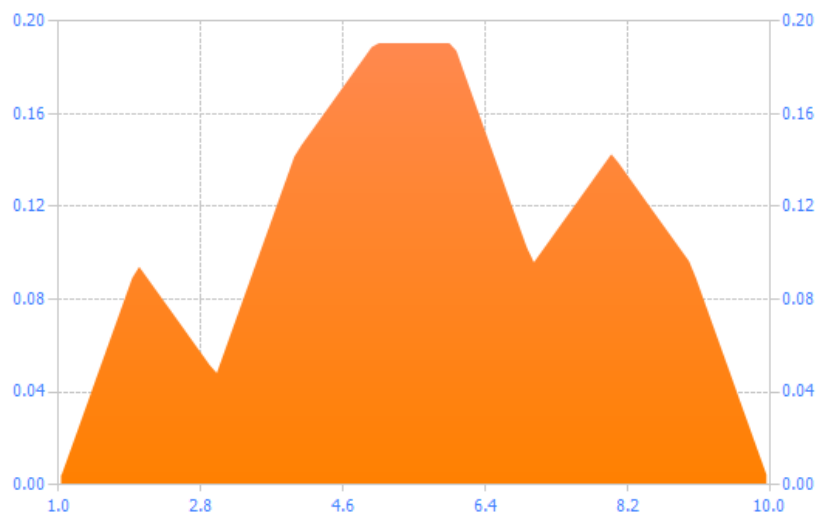
Example

The image below displays an example this function:

	Values	Densities
	1	0
	2	2
	3	1
	4	3
	5	4
	6	4
	7	2
	8	3
	9	2
	10	0

`=ContCustom(0,C7:C16,D7:D16,C11,0,10)`

This function returns probability density function for the specific values, densities and x, which is truncated below 0 and above 10.



Risk Kit 3.0 also includes the specific functions `ContCustom_pdf`, `ContCustom_cdf`, `ContCustom_icdf` and `ContCustom_variates` which return PDF, CDF, ICDF or variates, respectively.

ContCustom_pdf

This function returns the value of the probability density function at x for parameter vectors **values** and **densities**. Syntax of the function is following:

```
ContCustom_pdf(x, values, densities, [TruncLow], [TruncHigh])
```

The distribution can be truncated below at **TruncLow** and above at **TruncHigh**. These parameters are optional.

ContCustom_cdf

The function returns the value of the cumulative distribution function at x for parameter vectors **values** and **densities**. Syntax of the function is following:

```
ContCustom_cdf(x, values, densities, [TruncLow], [TruncHigh])
```

The distribution can be truncated below at **TruncLow** and above at **TruncHigh**. These parameters are optional.

ContCustom_icdf

Returns the x -percentile of the continuous custom distribution for parameter vectors **values** and **densities**. Note that $x \in [0;1]$. Syntax of the function is following:

```
ContCustom_icdf(x, values, densities, [TruncLow], [TruncHigh])
```

The distribution can be truncated below at **TruncLow** and above at **TruncHigh**. These parameters are optional.

ContCustom_variates

The function returns a variate from the continuous custom distribution for parameter vectors **values** and **densities**. Syntax of the function is following:

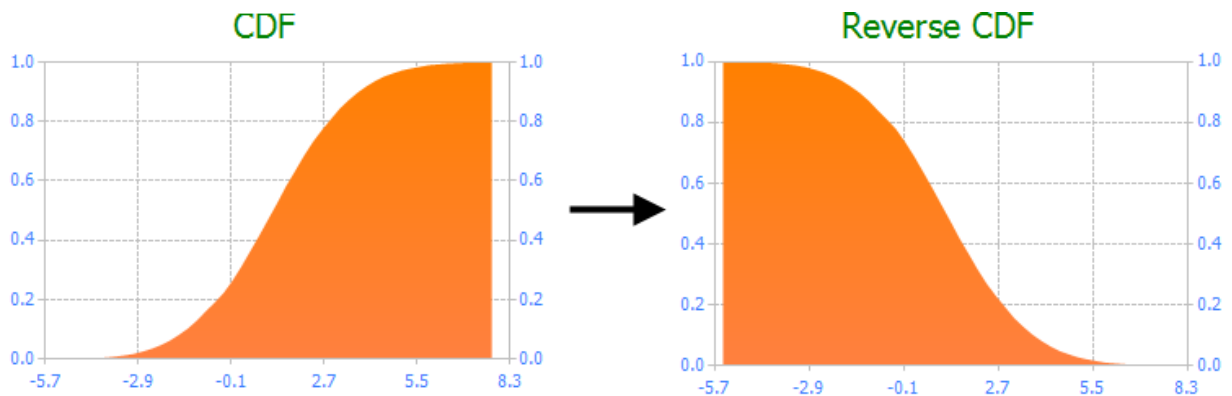
```
ContCustom_variates(values, densities, [TruncLow], [TruncHigh])
```

The distribution can be truncated below at **TruncLow** and above at **TruncHigh**. These parameters are optional.

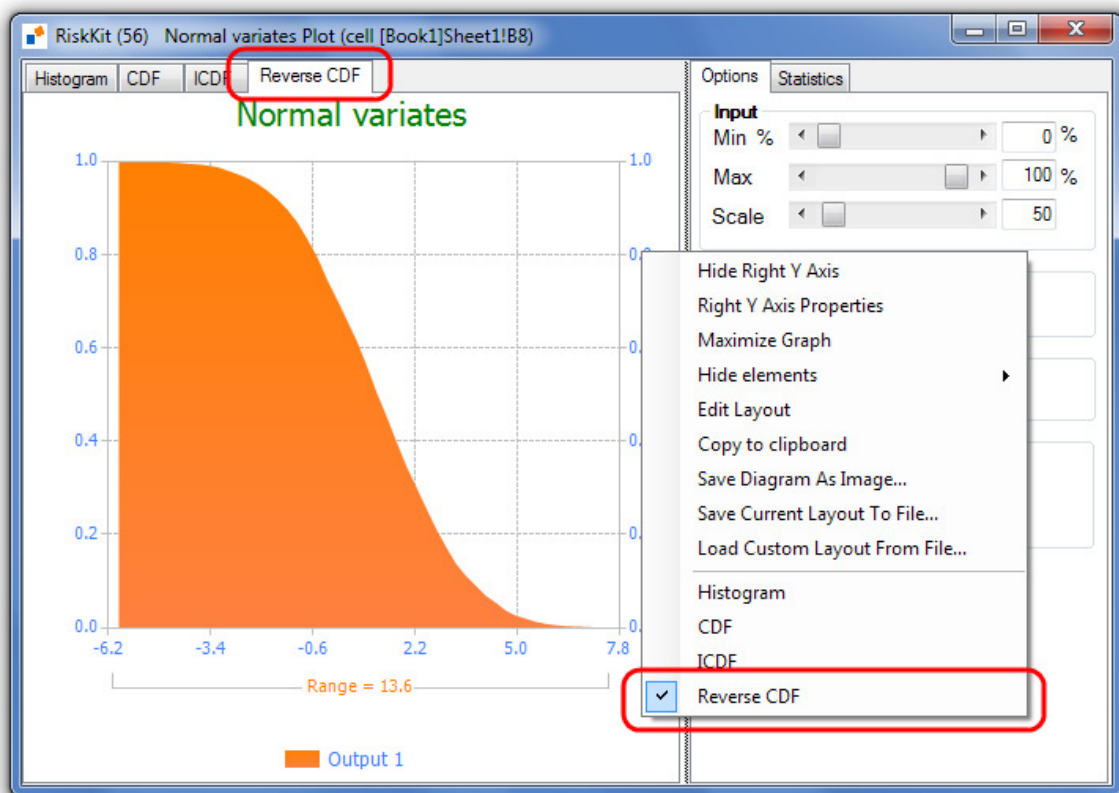
9. Reverse CDF

Risk Kit 3.0 implements a new type of charts: Reverse CDF. It represents a plot of the reverse cumulative distribution function, i.e. a value x is plotted against the probability to exceed this value, i.e.

$$x \rightarrow (x, 1 - CDF(x))$$



Reverse CDF is available at the single tab page in the chart window.

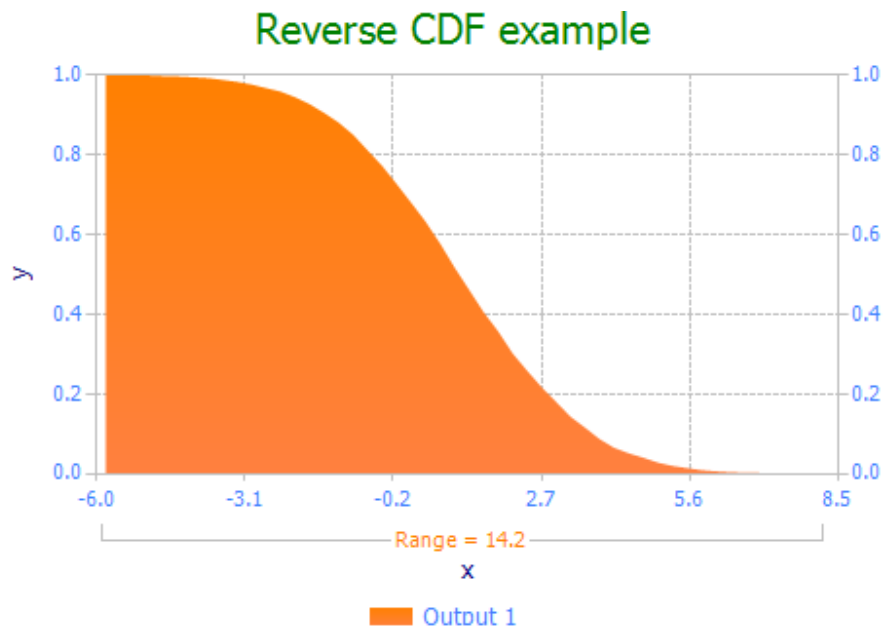


Reverse CDF can be used for creating embedded charts as well. The following plot function represents an example of such approach:

```
=Plot(B4,A4,"Reverse CDF example","x","y",A10,"REVCDF",480,320)
```

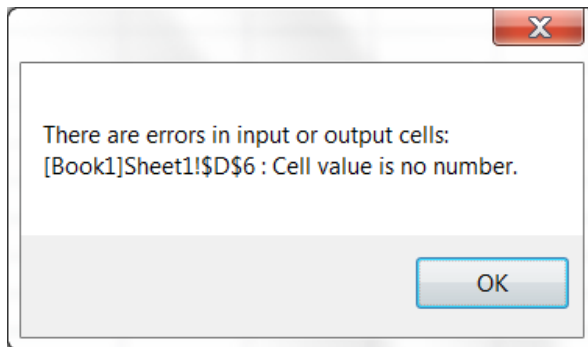
The *OutputChartType* parameter of the Plot function should be set to "REVCDF".

The image below represents an example of embedded Reverse CDF chart.



10. Diagnostic error messages

The error messages have been improved in Risk Kit 3.0. If during a simulation a runtime error occurs, for instance because an input or output value is not defined in a simulation run, the simulation is stopped and the cells with errors are precisely indicated.



11. Some functions have been renamed

Some of the functions have been renamed in Risk Kit 3.0 because they conflicted with standard Excel functions in previous version. The following table describes these functions:

Risk Kit 2.3	Risk Kit 3.0
FDist	FDistribution
TDist	TDistribution
Weibull	WeibullD
Poisson	PoissonD
Multinomial	MultinomialD

Functionality of these functions was not changed. The specific PDF (PMF), CDF, ICDF and variates functions were not changed, either.

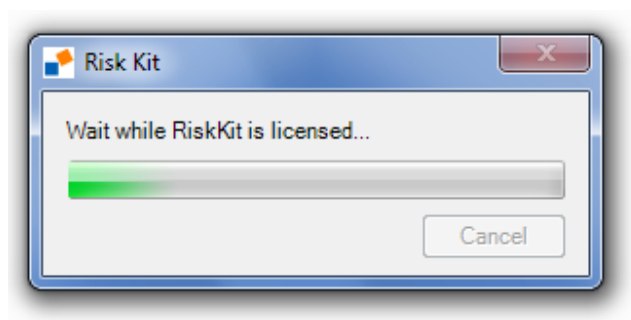
12. Licensing via the License Server

Risk Kit 3.0 allows a new option for licensing. Now the software can be licensed through a corporate License Server. The License Server is distributed as a single application and represents a Windows Service. It is installed on a server PC and allows licensing of a predefined number of remote Risk Kit clients over Internet or Ethernet.

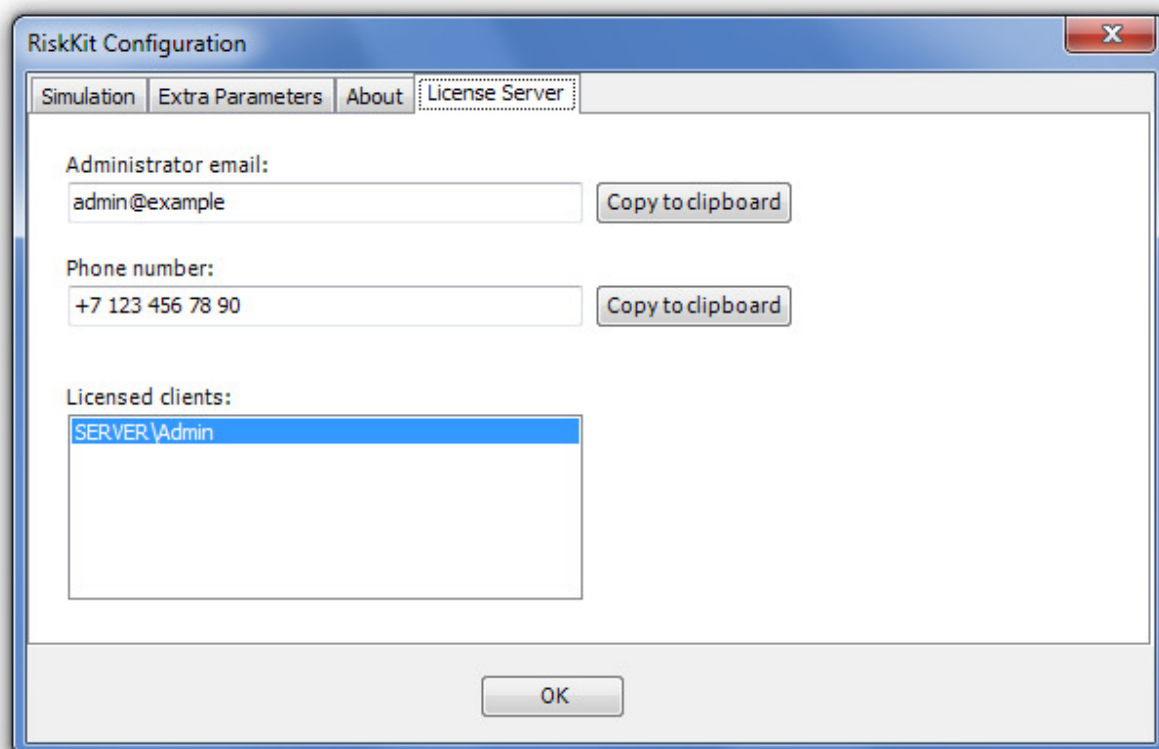


The main advantage of such approach is that Risk Kit doesn't require a hardware-related license any more.

When Risk Kit is licensed through the License Server, the following dialog appears after Excel started up:



This dialog indicates that Risk Kit tries to connect to the License Server and get the License. The tab page "License Server" is available in the configuration dialog when Risk Kit uses the License Server for licensing.



This tab page contains the administrator email and phone number and a list of all currently licensed clients. This list may be visible or hidden depending on the License Server configuration.

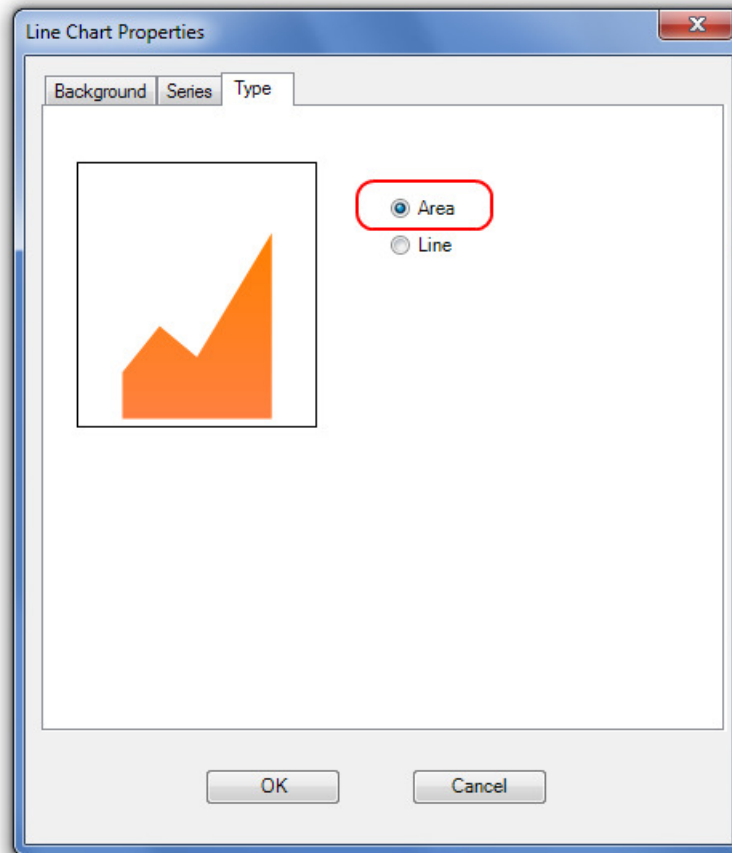
Risk Kit 3.0 provides the same functionality independently on the licensing type.

For more information about installing, configuring, administrating and using the License Server for licensing Risk Kit see the License Server User Guide.

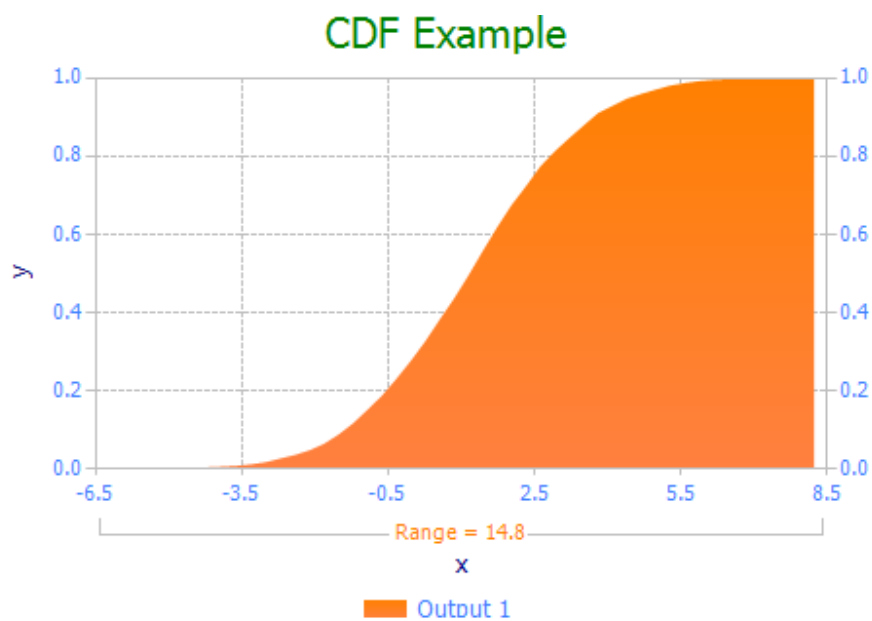
13. New style of chart for CDF, ICDF and Reverse CDF

Risk Kit 2.3 implemented the “Area” style only for the Histogram chart. Risk Kit 3.0 implements this style for the CDF, ICDF and Reverse CDF charts as well. Risk Kit 3.0 uses the “Line” style for the CDF, ICDF and Reverse CDF charts by default.

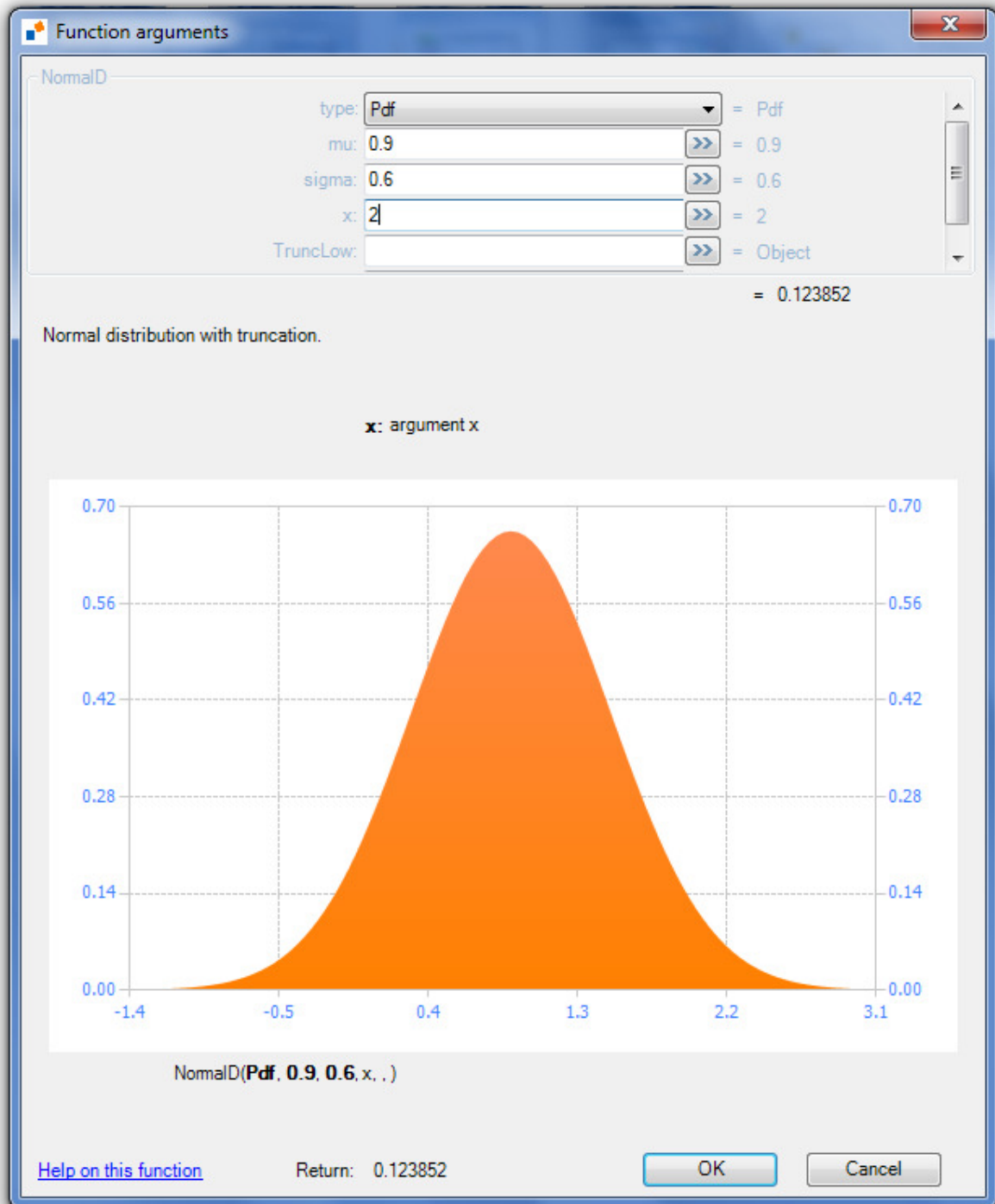
The style can be selected on the “Type” tab page in the chart properties window.



The image below shows an example of an embedded CDF chart with the “Area” style.



Risk Kit 3.0 implements this style also for the “Functions” dialog. The style can be selected from the “Type” tab page in the chart properties dialog.



14. Risk Kit 3.0 is loading faster.

Risk Kit 2.3 required up to 10 seconds for loading at Excel start up. This rate was significantly improved: Risk Kit 3.0 loads up to 70% faster.

15. Contact

For questions and comments, please contact

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