Info zu *SimplexNumerica*
Label Format
V17

SimplexNumerica charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, etc, are all text strings.

SimplexNumerica uses parameter substitution to allow you to configure precisely the information contained in the text and their format.

The label output can be described by 'Format Strings'.

In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

"{label} ({percent}%)"

When the sector label is actually drawn, *SimplexNumerica* will replace "{label}" with the sector name, and "{percent}" with the sector percentage. So, the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

"{label}: US${value|2}K ({percent}%)"

The sector label will then become something like "ABC: US$123.00 (34.56%)".

In general, in SimplexNumerica parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

In the following the label format of *SimplexNumerica* is described. It only applies to the following chart types (see thumbnails):
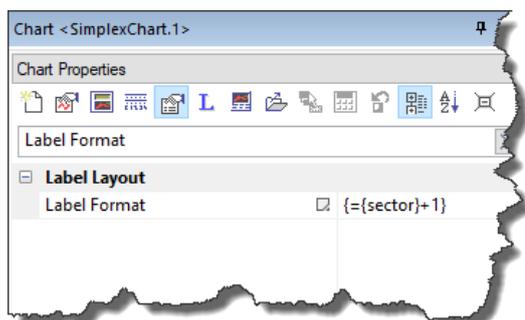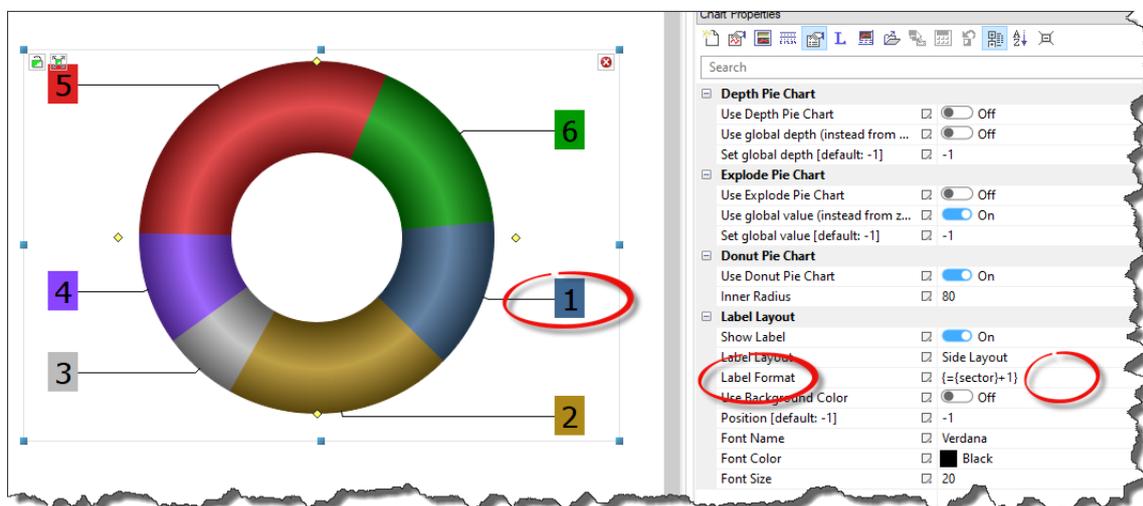
- 2D Line Charts
- 2D Bar Charts
- Polar Charts
- Pie Charts
- Contour Plots
- Surface Plots
- Meter Charts
- Misc. Charts

The label format is entered in the respective properties, e.g.: for the bar chart:

Label Format
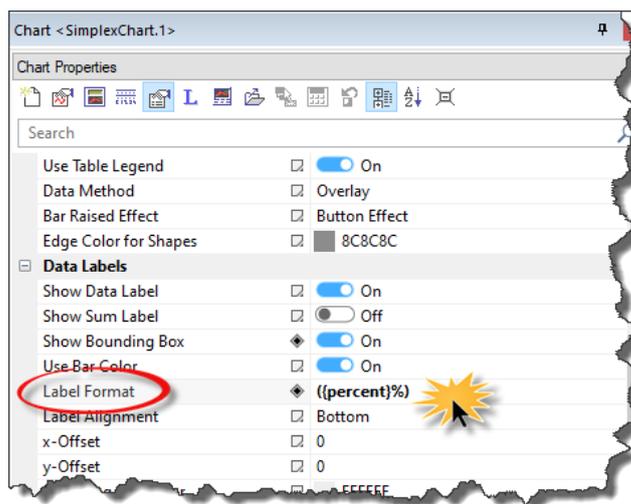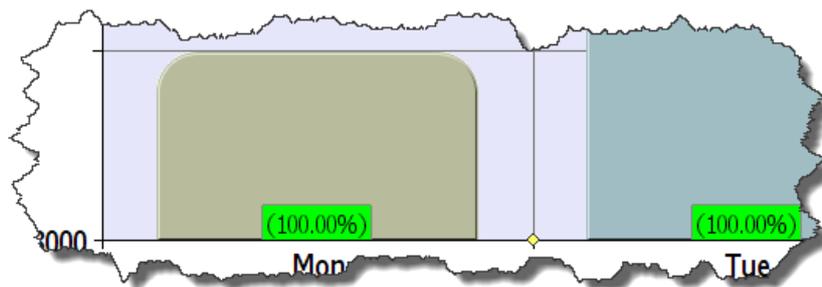
... or for a Polar Chart:

Just search for the term *,Label Format'*

Label Format

Parameter Substitution and Formatting

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Format Strings

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For example, when drawing a pie chart with side label layout, the default sector label format string is:

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The sector label will then become something like "ABC: US$123.00 (34.56%)".

In general, in *SimplexNumerica* parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, *SimplexNumerica* supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the **Number Formatting** and **Date/Time Formatting** sections below for details.

Parameter Expressions

SimplexNumerica supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

"USD {value} (Euro {={value}*0.9})"

In the above, "{value}" will be substituted with the actual value of the sector. The expression "{={value}*0.9}" will be substituted with the actual value of the sector multiplied by 0.9.

SimplexNumerica parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Label Format

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

Parameter	Description
sector	The sector number. The first sector is 0. The nth sector is (n-1).
dataSet	Same as {sector}. See above.
label	The text label of the sector.
dataSetName	Same as {label}. See above.
value	The data value of the sector.
percent	The percentage value of the sector.
field*N*	The (N + 1)th extra field. For example, {field0} means the first extra field.

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the {dataSetName} parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

Parameter	Description
x	The x value of the data point. For an enumerated x-axis, the first data point is 0, and the nth data point is (n-1).
xLabel	The bottom x-axis label of the data point.
x2Label	The top x-axis label of the data point.
value	The value of the data point.
accValue	The sum of values of all data points that are in the same x position and same data group as the current data point, and with data set number less than or equal to the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
totalValue	The sum of values of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
percent	The percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.

Label Format

accPercent	The accumulated percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
gpercent	The percentage of the data point based on the total value of all data points in a layer.
dataSet	The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1).
dataSetName	The name of the data set to which the data point belongs.
dataItem	The data point number within the data set. The first data point is 0. The nth data point is (n-1).
dataGroup	The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1).
dataGroupName	The name of the data group to which the data point belongs.
layerId	The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1).
field$N$	The (N + 1)th extra field. For example, {field0} means the first extra field, and {field1} means the second extra field. {field$N$} means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.
diField$N$	Same as field$N$. See above.
dsField$N$	Similar to field$N$, except that dsField$N$ means the extra field is indexed by data set number. The Pth data set corresponds to the Pth element of the extra field.
dsdiField$N$	Similar to field$N$, except that dsdiField$N$ means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth data set corresponds to the Pth element of the (N + Q)th extra field.

Additional Parameters for Line Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameter	Description
zx	The symbol scale in the x dimension. Applicable for layers with symbol scales.
zy	The symbol scale in the y dimension. Applicable for layers with symbol scales.
z	The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales.

Label Format

Additional Parameters for Trend Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameter	Description
slope	The slope of the trend line in linear regression analysis.
intercept	The y-intercept of the trend line in linear regression analysis.
corr	The correlation coefficient in regression analysis.
stderr	The standard error in regression analysis.
coeff*N*	The coefficient with index N in the regression formula. For example, coeff0 and coeff1 are the a_0 and a_1 in the regression formula.

Additional Parameters for Box-Whisker Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameter	Description
top	The value of the top edge of the box-whisker symbol.
bottom	The value of the bottom edge of the box-whisker symbol.
max	The value of the maximum mark of the box-whisker symbol.
min	The value of the minimum mark of the box-whisker symbol.
med	The value of the median mark of the box-whisker symbol.

Additional Parameters for HLOC and CandleStick Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameter	Description
high	The high value.
low	The low value.
open	The open value.
close	The close value.

Additional Parameters for Vector Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameter	Description
dir	The direction of the vector.

Label Format

len	The length of the vector.

Parameters for All Polar Layers

The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

Parameter	Description
radius	The radial value of the data point.
value	Same as {radius}. See above.
angle	The angular value of the data point.
x	Same as {angle}. See above.
label	The angular label of the data point.
xLabel	Same as {label}. See above.
name	The name of the layer to which the data point belongs.
dataSetName	Same as {name}. See above.
i	The data point number. The first data point is 0. The nth data point is (n-1).
dataItem	Same as {i}. See above.
z	The symbol scale. Applicable for layers with symbol scales.
field$N$	The (N + 1)th extra field. For example, {field0} means the first extra field. {field$N$} means the extra field is indexed by the data point number. The P_{th} data point corresponds to the Pth element of the extra field.
diField$N$	Same as field$N$. See above.
dsField$N$	Similar to field$N$, except that dsField$N$ means the extra field is indexed by layer index. The Pth layer corresponds to the Pth element of the extra field.
dsdiField$N$	Similar to field$N$, except that dsdiField$N$ means the extra fields are indexed by both the layer index and data point number. The Pth data item of the Qth layer corresponds to the Pth element of the (N + Q)$_{th}$ extra field.

Label Format

Additional Parameters for PolarVector Layers

The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameter	Description
dir	The direction of the vector.
len	The length of the vector.

Parameters for Axis

The following table describes the parameters available for the axis.

Parameter	Description
value	The axis value at the tick position.
label	The axis label at the tick position.

Parameters for Pyramid Charts

The following table describes the parameters available for pyramid charts.

Parameter	Description
index	The index number of the pyramid layer. The first pyramid layer is 0. The nth pyramid layer is (n-1).
dataSet	Same as {index}. See above.
label	The text label of the pyramid layer.
dataSetName	Same as {label}. See above.
value	The data value of the pyramid layer.
percent	The percentage value of the pyramid layer.
field*N*	The (N + 1)th extra field. For example, {field0} means the first extra field.

Label Format

Number Formatting

For parameters that are numbers, *SimplexNumerica* supports a number of formatting options in parameter substitution.

For example, if you want a numeric field *{value}* to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use *{value|2,.}*. The number *123456.789* will then be displayed as *123,456.79*.

For numbers, the formatting options are specified using the following syntax:

{[param]|[a][b][c][d]}

where:

Parameter	Description
[param]	The name of the parameter
[a]	- If this field a number, it specifies the number of decimal places (digits to the right of the decimal point). - If this field starts with "E" or "e", followed by a number **n**, the value will be formatted using scientific notation with **n** decimal places. If the "E" or "e" is not followed by a number, 3 is assumed. For example, *{value|E4}* will format the value 10.3 to *1.0300E+1*, and *{value|e4}* will format the same value to *1.0300e+1*. - If this field starts with "G" or "g", followed by a number **n**, the value will be formatted using the scientific notation only if the value is large and requires more than the **n** digits, or the value is less than 0.001. If scientific notation is used, **n** is the number of significant digits. If the "G" or "g" is not followed by a number, 4 is assumed. For example, consider the format string *{value|G4}*. The value 10 will be formatted to *10*. The value 100000 will be formatted to *1.000E+5*. Similarly, for *{value|g4}*, the value 10 will be formatted to *10*, while the value 100000 will be formatted to *1.000e+5*. - If this field starts with "P" followed by a number **n**, the value will be formatted with no more than **n** decimal places. The result may contain less decimal places if they are not needed, or if the value already has more than **n** significant digits. If the "P" is not followed by a number, 3 is assumed. For example, if P3 is used, the value 1.234567 will be formatted to 1.235 (3 decimal points); the value 1.2 will be formatted to 1.2 (additional decimal places are not needed); the value 12.34567 will be formatted to 12.35 (already has more than 3 significant digits), and the value 123456.789 will be formatted to 123457 (already has more than 3 significant digits).

Label Format

	The "P" format is useful to format a number to a given precision, without using more decimal places than needed or switching to scientific formatting. • For Axis label formatting, the special character "@" can be used. It means to use a fixed number of decimal places automatically determined by the Axis object. For example, if the axis labels are 0, 0.5, 1, 1.5, 2, the Axis object may decide to use 1 decimal place, in which case the labels will become 0.0, 0.5, 1.0, 1.5, 2.0. If you skip this field, *SimplexNumerica* will display the exact value using at most 6 decimal places.
[b]	The thousand separator, which should be a non-alphanumeric character (not 0-9, A-Z, a-z). Use '~' for no thousand separator. If this character is not specified or is '?', the default is no thousand separator.
[c]	The decimal separator. Use '~' for no decimal separator. If this character is not specified or is '?', the default is '.'.
[d]	The negative sign character. Use '~' for no negative sign character. If this character is not specified or is '?', the default is '-'.
[e]	The currency character. The currency character will appear before the digits of the number, but after the negative sign character for negative numbers.

Label Format

Date/Time Formatting

For parameters that are dates/times, the formatting options can be specified using the following syntax:

{[param]|[datetime_format_string]}

where [datetime_format_string] must start with an English character (A-Z or a-z) that is not "G", "g", "E" or "e", and may contain any characters except '}'. (If it starts with "G", "g", "E" or "e", it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

Parameter	Description
yyyy	The year in 4 digits (e.g. 2002)
yyy	The year showing only the least significant 3 digits (e.g. *002* for the year 2002)
yy	The year showing only the least significant 2 digits (e.g. *02* for the year 2002)
y	The year showing only the least significant 1 digit (e.g. *2* for the year 2002)
mmm	The month formatted as its name. The default is to use the first 3 characters of the English month name (Jan, Feb, Mar ...).
mm	The month formatted as 2 digits from 01 - 12, adding a leading zero if necessary.
m	The month formatted using the minimum number of digits from 1 - 12.
MMM	The first 3 characters of the month name converted to upper case.
MM	The first 2 characters of the month name converted to upper case.
M	The first character of the month name converted to upper case.
dd	The day of month formatted as 2 digits from 01 - 31, adding a leading zero if necessary.
d	The day of month formatted using the minimum number of digits from 1 - 31.
w	The name of the day of week. The default is to use the first 3 characters of the english day of week name (Sun, Mon, Tue ...).
hh	The hour of day formatted as 2 digits, adding a leading zero if necessary. The 2 digits will be 00 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
h	The hour of day formatted using the minimum number of digits. The digits will be 0 - 23 if the 'a' option (see below) is not specified, otherwise it will be 1 - 12.
nn	The minute formatted as 2 digits from 00 - 59, adding a leading zero if necessary.
n	The minute formatted using the minimum number of digits from 0 - 59.

ss	The second formatted as 2 digits from 00 - 59, adding a leading zero if necessary.
s	The second formatted using the minimum number of digits from 0 - 59.
fff	The millisecond formatted as 3 digits from 000 - 999.
ff	The hundredths of a second formatted as 2 digits from 00 - 99.
f	The tenths of a second formatted as 1 digit from 0 - 9.
a	Display either 'am' or 'pm', depending on whether the time is in the morning or afternoon. The text 'am' and 'pm' can be modified.

For example, a parameter substitution format of *{value|mm-dd-yyyy}* will display a date as something similar to *09-15-2002*. A format of *{value|dd/mm/yy hh:nn:ss a}* will display a date as something similar to *22/09/20 03:04:05 pm*.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format *{value|mmm '<*color=dd0000*>'yyyy}* will display a date as something like *Jan <*color=dd0000*>2005* (the <*color=dd0000*> is a CDML tag to specify red text color). Note that the <*color=dd0000*> tag is copied directly without substitution, even it contains "dd" which normally will be substituted with the day of month.

Escaping URL/HTML/CDML characters

Parameter substitution is often used to create HTML image maps. In HTML, some characters have special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, *SimplexNumerica* will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&#nn;" (eg. ">" will become ">"). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, *SimplexNumerica* will also remove CDML fields in creating image maps. It is because CDML is only interpreted in *SimplexNumerica*, and should not be useful outside of *SimplexNumerica* (such as in browser tool tips).

In some cases, you may not want *SimplexNumerica* to escape special characters. For example, if the parameters have already been escaped before passing to *SimplexNumerica*, you may want to disable *SimplexNumerica* from escaping them again.

SimplexNumerica supports the following special fields to control the escape methods - "{escape_url}", "{noescape_url}", "{escape_html}", "{noescape_html}", "{escape_cdml}" and "{noescape_cdml}". These fields enable/disable the escape methods used in the template fields that follow them.