

## User Manual for the graphomate matrix for SAP Analytics Cloud

	Profit	Profit FC	abs		perc
<b>Δ ACME</b>	<b>95.6k</b>	<b>80.9k</b>		14.7k	0.2
<b>Δ Home Office</b>	<b>15.9k</b>	<b>14.3k</b>		1.6k	0.1
<b>Δ Envelopes</b>	<b>0.9k</b>	<b>0.9k</b>		40.0	0.0
Central	0.5k	1.2k	-0.7k	◀◀ -0.6	
North	146.3	485.7	-339.4	◀◀ -0.7	
South	250.0	-0.8k		1.0k	1.3
<b>Δ Copiers</b>	<b>9.6k</b>	<b>5.9k</b>		3.7k	0.6
Central	4.6k	1.7k		2.9k	1.8
North	2.0k	3.5k	-1.5k	◀◀ -0.4	
South	3.0k	0.7k		2.3k	3.2
<b>Δ Art</b>	<b>5.4k</b>	<b>7.5k</b>	-2.1k	◀◀ -0.3	
Central	3.4k	4.6k	-1.2k	◀◀ -0.3	

Version 2021.2 – as of May 2021

<https://www.graphomate.com>

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## Introduction

The **graphomate matrix** is our new table component for Power BI, Tableau and SAP Analytics (Analytics Cloud (SAC) and Lumira Designer).

This allows you to easily realize IBCS-compliant tables, but also to perform various (conditional) formatting, because the graphomate matrix can be designed using its own formatting language - the so-called Cell Formatting Language (CFL). When developing the graphomate matrix, the focus was on performance, horizontal and vertical scrolling, hierarchy displays in rows and columns, and graphical visualization elements:

	Profit	Profit FC	abs	perc
△ ACME	372.8k	377.0k	-4.1k	-1%
▣ Consumer	188.7k	199.8k	-11.1k	-6%
△ Corporate	123.4k	114.9k	8.5k	7%
△ Art	8.0k	16.0k	-8.1k	-50%
Central	5.5k	7.3k	-1.8k	-24%
South	2.0k	5.0k	-3.1k	-61%
North	0.5k	3.7k	-3.2k	-87%
△ Paper	2.4k	12.9k	-10.5k	-81%
Central	1.2k	10.6k	-9.4k	-89%
North	0.4k	1.2k	-0.8k	-67%
South	0.8k	1.1k	-0.3k	-24%

The graphomate matrix replaces the **graphomate tables**, which we have been offering since 2014. Although the graphomate tables offered the possibility to map IBCS requirements to a table with just a few clicks. However, our customers wanted more formatting options and better performance, especially for large tables. We intend to offer the graphomate matrix not only for the SAP Analytics Cloud (SAC) and Lumira Designer step by step but also for other SAP Analytics front-ends.

Unfortunately, the SAP Partner Interface (SDK) for SAC currently does not offer the possibility to connect data directly. This is announced for H1.2021. Currently, unfortunately, a script workaround must be worked with to transfer data from a SAC standard visualization element to the graphomate matrix.

In the following we describe the properties of the graphomate matrix as well as the possibility to set them in our user interface. This user interface is almost identical in all BI front ends - Power BI, Tableau, SAC and Lumira Designer. Formatting settings of the graphomate matrix can be stored on the graphomate server and used in other environments.

## Installation

In the SAP Analytics Cloud the graphomate extensions are installed as so-called 'Custom Widget'.

The upload of the contribution.json is done as described below::

1. Choose from Main Menu / Browse / Custom Widgets
2. Use the '+'-symbol to select and store the graphomate JSON

The graphomate extensions can now be used as 'custom widget' in the Application Designer.

## Quick Start

### Using a graphomate matrix in an Analytic Application and data connection (workaround necessary)

Currently, SAP has not yet released the data binding via the SDK of the SAC, which is why a short script is required to bind data at runtime. Data sources in the SAC Application Designer are currently always connected with widgets. Therefore it is first necessary to connect a standard table with a data source and to execute the desired selection. Afterwards the following script text can be used in the onInitialization script to transfer the data of the standard table to the matrix.

The following script should be used:

```
graphomate_matrix_1.setResultSetFromTable(Table_1);
```

### Open the graphomate property sheet (GPS)





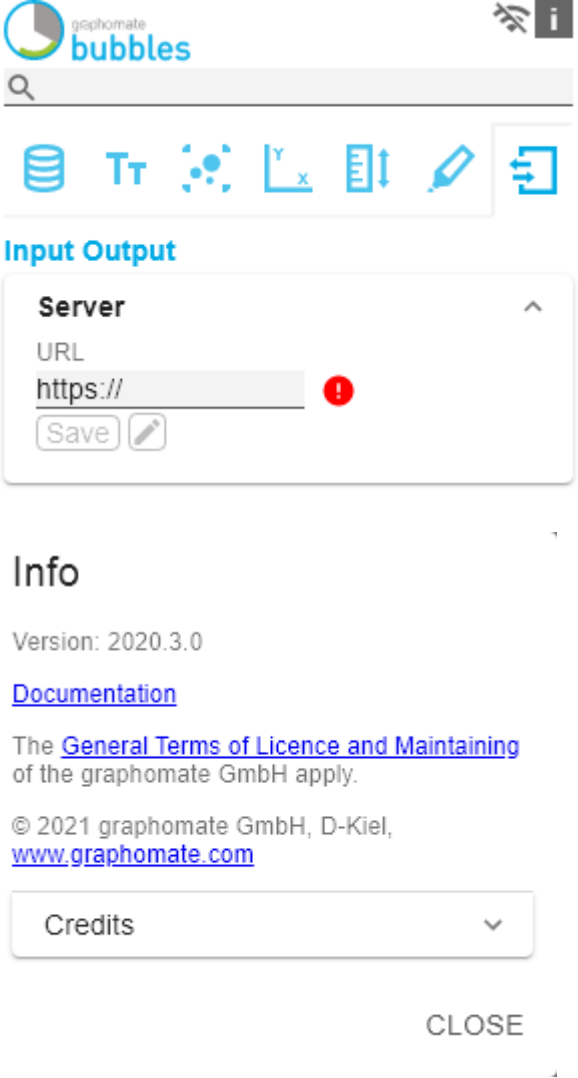
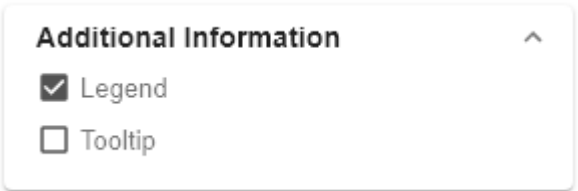
Settings for the components are set via the graphomate property sheet (GPS). Select the graphomate matrix and go to the 3 dots next to the component. Then select "Edit Styling". The Builder Panel (red arrow) with the GPS should appear. Now configure the settings on the graphomate matrix as desired.

The screenshot displays the SAP Analytics Cloud interface. On the left, a data table is visible with columns: Units Sold, Manufacturing Price, Sale Price, Gross Sales, and Discounts. The table contains data for various categories like Overall, Amarilla, Channel Partners, Enterprise, Government, Midmarket, Small Business, Montana, Peseo, and others. On the right, the Builder panel is open, showing the 'graphomate\_all matrix' component. A red circle highlights the three dots menu next to the component, and a red arrow points to the 'Edit Styling' option. The Builder panel shows sections for Data, Calculations, Scenario Definition, and Scenario Assignment.

## graphomate property sheet (GPS)

- [Data Tab](#)
- [Labels Tab](#)
- [Axes Tab](#)
- [Chart Specific Tab](#)
- [Input Output Tab](#)
- [Default values](#)

The following usage structure can be found in all graphomate extensions with the graphomate property sheet (GPS):

<p><b>Search field</b></p> <p>Use the search field to quickly find a setting (example "Title") and change it.</p> <p><b>Connection to the graphomate server</b></p> <p> active connection to graphomate server</p> <p> no active connection to the graphomate server</p> <p><b>Info Tab</b></p> <p>In the header of the GPS there is an info symbol (  ). Click on the  icon to open a tab with relevant information:</p> <ul style="list-style-type: none"> <li>• the version number of the installed extension (important information for the support)</li> <li>• link to the graphomate Support Desk</li> <li>• to the general terms and conditions</li> <li>• to the graphomate website and</li> <li>• a list of the software libraries used (Credits)</li> </ul>	 <p>The screenshot shows the 'graphomate bubbles' interface. At the top right, there is a Wi-Fi icon and an info icon. Below the search bar, there are several icons representing different tabs: a database icon, 'Tt' (Title), a scatter plot, a coordinate system, a list, a pencil, and a document. The 'Input Output' tab is active, showing a 'Server' section with a 'URL' field containing 'https://'. A red exclamation mark icon is next to the URL field, and a 'Save' button is below it. Below the 'Server' section, there is an 'Info' section showing 'Version: 2020.3.0', a link to 'Documentation', and a link to 'General Terms of Licence and Maintaining of the graphomate GmbH apply.'. At the bottom of the 'Info' section, there is a 'Credits' dropdown menu and a 'CLOSE' button.</p>
<p><b>Checkboxes</b></p> <p>An active property is indicated by a white check mark in the checkbox. To deactivate it, click on the checkbox again.</p>	 <p>The screenshot shows the 'Additional Information' section of the interface. It contains two checkboxes: 'Legend' which is checked, and 'Tooltip' which is unchecked.</p>

**Color Picker**

You can enter the color value as HEX code or click on the colored circle.

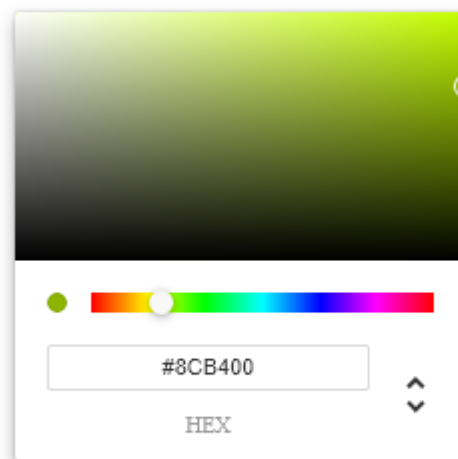
Use the Color Picker or enter color values as HEX, RGB, or HSL code. You switch between these color models using the small arrows on the right side of the color picker.

**Deviations**

Good Color

 #8CB400

Bad Color


 #FF0000 Invert**Good Color**

OK

**Adding new elements to lists**

Click on the  icon to create new elements in a list.

**Removing elements from a list**

Hover over the element to delete an object. The following symbol appears . Click on the icon to delete the selected entry.

**Scenario Definition** AC PP BU

Import / Export

W3sic2hvcnQioiJBQyIsIr

**Filter Option**

In some cases, it is necessary that several settings are only applied to certain key figures, dimensions or dimensional characteristics. You can use the filter option to define the combination to which the setting is to be applied.

In the example on the left, the desired setting is only applied to the key figure "budget". This can be, for example, a certain number formatting, a scenario or a certain icon for displaying the key figure.

Filter states can be defined in the following settings of graphomate extensions:

- graphomate matrix
  - Value Format
  - Calculations/Deviations
  - Scenario Assignment
  - Bar Chart Assignment
  - Pin Chart Assignment
  - Background Bar Assignment
- graphomate bubbles
  - Value Format
- graphomate pictograms
  - Pictograms/Icon Assignment

**Measures**

Dimension



Measures

Members

budget x

OK

**Copy Filter**

Filter settings on dimensions can be saved to the clipboard and reused in other graphomate extensions settings. Use the   symbols for this purpose.

**aggregation**

New Member Name

Overall

Target Dimension

Aggregation Type

Sum

Filter (optional)




no items


Description (optional)

OK



**Input mode: Field / comma separated list (csv)**

Properties with the  symbol allow the definition of settings on the graphomate property sheet in two

variants. The mode can be changed by clicking on the  symbol. The following modes are available:


1. per field: The value is entered per field. After one field has been filled, another field is created automatically.
2. As a list: The entry is made as a comma-separated list.

Example: Application of the scenarios to elements of a series (see picture)


The first series contains two forecast values (FC) and two budget values (BU). The second series contains only values from the previous period (PP). You can enter the assignment of the scenarios as follows:

Variant per field for series 1: FC (field 1), FC (field 2), BU (field 3), BU (field 4)

Variant as list for series 2: PP,PP,PP,PP,


**Scenario Assignment** Scenarios 1 

FC FC BU BU

Scenarios 2 

PP,PP,PP,PP,

Scenarios 3

Scenarios by Series 

no items

 Scenarios In Axis Scenario Legend Enabled Scenarios In Deviations

## Data Tab

### Calculation

#### Deviations

This property can be used to calculate deviations. It is a list, where each individual item represents the calculation of a new deviation member. The variances are calculated as follows:

**Absolute: Minuend - Subtrahend**

**Percentage: (Minuend - Subtrahend) / |Subtrahend|**

**i** Please note: At this point the values for deviations are only calculated. You have the possibility to visualize these calculated values on the tab "Chart Specific".

#### Deviations Pop-Up

You can create new variances using the **+** sign. Each configuration has the following properties:

- **New Member Name:** The unique name of the newly calculated member that is displayed in the table.
- **Type:** Either *Absolute* or *Percent*. Defines whether an absolute or relative deviation is calculated.
- **Target Dimension:** The dimension in which the new, calculated deviation member should be inserted - e.g. "measures".
- **Minuend Member:** The member that is to serve as a minuend, e.g. an actual value.
- **Subtrahend Member:** The member that is to serve as subtrahend, e.g. a value from the previous year.
- **Filter (optional):** A list of filter objects. Each filter object can restrict a dimension to certain members. Only deviation data points are created that correspond to the filter conditions.
- **Description:** Short name that describes the configuration to be recognizable e.g. "abs"


#### Calculated Members

Calculate additional columns, rows or members using formula input.

#### Calculated Members Pop-Up

The screenshot shows the 'Data' tab configuration in the graphomate matrix application. The interface includes a search bar, navigation icons for database, table, chart, and settings, and a 'Data' section with the following settings:

- Calculations:** A list of calculation configurations, each with a '+' icon to add a new one. The current list contains five entries, all labeled 'no items'.
  - Deviations
  - Calculated Members
  - N + Rest
  - Sort Configurations
  - Calculated Aggregates
- Aggregation Type:** A dropdown menu currently set to 'Sum'.
- Overall Node Name:** A text input field containing 'Overall'.
- Following Result Nodes:** A checkbox that is currently unchecked.

You can create new calculated members using the  sign . Each configuration has the following properties:

- **New Member Name:** The unique name of the newly calculated member that is displayed in the table.
- **Target Dimension:** The dimension in which the new, calculated member should be inserted - e.g. "measures".
- **Expression:** An expression to be evaluated for each calculated data point. Here, members of the dimension are encapsulated in curly brackets with leading \$. (e. g. \${member1}). This results in the following possibilities, for example::
  - Ratio of two members:  $\frac{\${member1}}{\${member2}}$
  - Conversion of working hours into working days:  $\frac{\${workinghours}}{8}$
  - Calculation of new measures:  $\${Sales} - \${Costs}$


You can find a detailed description of the syntax [here](#)

- **Filter (optional):** A list of filter objects. Each filter object can restrict a dimension to certain members. Only calculated member data points are created that correspond to the filter conditions.
- **Description (optional):** Short name that describes the configuration to be recognizable e.g. "abs"

#### N + Rest

Define how many elements should be mapped as Top N or Bottom N with Rest representation.

#### N + Rest Pop-Up (Top 3)

You can create new groups for N + rest using the  - sign. Each configuration has the following properties:

## Deviation

New Member Name

Type

Absolute

Target Dimension

Minuend Member

Subtrahend Member

Filter (optional)



no items

Description (optional)

OK

## calculation

New Member Name

Target Dimension

Expression

Filter (optional)



no items

Description (optional)

OK

- **Enable:** Applies the N + Rest Configuration, when enabled.
- **Mode:** Choose between Top (top) and Bottom (bottom).
- **Number n of top/bottom members:** Define the number of top/bottom elements.
- **Target Dimension:** The dimension into which the new top/bottom member should be inserted - e.g. "measures".
- **Target Dimension Filter (optional):** Here you filter which members of other column dimensions should affect the ranking. If there is more than one column member and there is no filter defined, the ranking of a row is based on the sum of all columns.
- **Rest Member Name (optional):** Sets a label for the rest member.
- **Description (optional):** Short name describing the configuration to be recognizable.

*Sort Configurations*

Here you can sort members of dimensions. Measures are also interpreted as a dimension and can be sorted accordingly.

In future versions we will extend these options.

*Sort Configurations Pop-up*

You can use the **+** sign to create a new sort order for a dimension. Each configuration has the following properties:

- **Dimension:** A dimension the members of which should be sorted.
- **Member:** Here you can use drag and drop to sort the members of a dimension or measures.
- **Description:** Short name describing the configuration to be recognizable

*Calculated Aggregation*

You can create aggregations that differ from the standard for certain dimensions. Use this, for example, to create a different aggregations for each column.

*Calculated Aggregation Pop-Up*

You can use the **+** sign to create a new aggregation. Each aggregation configuration has the following properties:

### TOP 3

Enable

Mode  
Top

Number n of top/bottom members  
3

Target Dimension  
 

Target Dimension Subset (optional) ↶ ↷ +  
no items

Rest Member Name (optional)  
 

Description (optional)  
 

OK

### Sort Configuration 1

Dimension  
Measures

Members  

DS:2,MEAS:id\_62  
DS:2,MEAS:id\_61  
DS:2,MEAS:id\_53

Description (optional)  
 

OK

- *New Member Name*: The unique name, of the newly aggregated aggregation member, that will be displayed in the table.
- *Target Dimension*: The dimension into which the new aggregation should be inserted - e.g. "measures".
- *Aggregation Type*: You can choose between Sum (Sum), Minimum (Min), Maximum (Max), Count (Count) and Mean (Mean).
- *Filter (optional)*: A list of filter objects. Each filter can restrict a dimension to specific members. Only data points are created which match the specified members for the dimensions selected in the filter.
- *Description (optional)*: Specifies a descriptive short name for the set configuration.

#### Aggregation Type

The graphomate matrix calculates aggregations for displaying hierarchy nodes, if the host environment doesn't provide them.

Here you can select the type of aggregation - the default setting is "Sum". This feature, not to be confused with Calculated Aggregations, is much simpler and creates the same Aggregation Type for all columns.

#### Aggregation Node Name

At this point, a separate name can be assigned to the aggregation elements - e.g. "Sum" or "Total" or also "Europe".

#### Following Result Nodes

Change the position of the totals.

### aggregation

New Member Name  
Overall

Target Dimension  
\_\_\_\_\_

Aggregation Type  
Sum

Filter (optional) ↶ ↷ +

no items

Description (optional)  
\_\_\_\_\_

OK

### Scenario Definition

This property determines the appearance of the scenarios - also known as Data Types.

The four standard scenarios of the International Business Communication Standards are already defined, but can also be adapted.

You can create new scenarios using the  sign.

#### Scenario Definition Pop-Up

Each scenario has the following characteristics:

- **Identifier:** A character string (such as AC) that can be used to reference the scenario - for example, in the Scenario Assignment below, for bar, pin, and background bars or their axes - see the tab "Chart Specific".
- **Color:** Here you can define the color using the color picker or enter a HEX, RGB or HSL code. You can switch these using the small arrows on the right side of the color picker.
- **Fill Type:** You can choose from the following fill patterns: *Filled*, without filling (*Empty*), hatching down (*Hatched Down*), hatching thick down (*Hatched Down Bold*), hatching up (*Hatched Up*), hatching thick up (*Hatched Up Bold*), and dotted (*Dotted*).
- **Shape:** Refers to the pinheads. The following shapes are available: circle (*circle*), rectangle (*rect*), rhomb (*rhomb*), wedge (*wedge*), no symbol (*none*).
- **Width:** This property is not used in the graphomate matrix.
- **Font Weight:** Choose between *normal* or *bold* font size for this scenario.

#### Import/Export

Copy this string to use scenarios in other graphomate components.

**Scenario Definition**
^

+

AC

PP

BU

Import / Export

W3sic2hvcnQiOiJBQylsIi

AC

Identifier

AC

Color

#222222

Fill Type

Filled

Shape

rect

Width

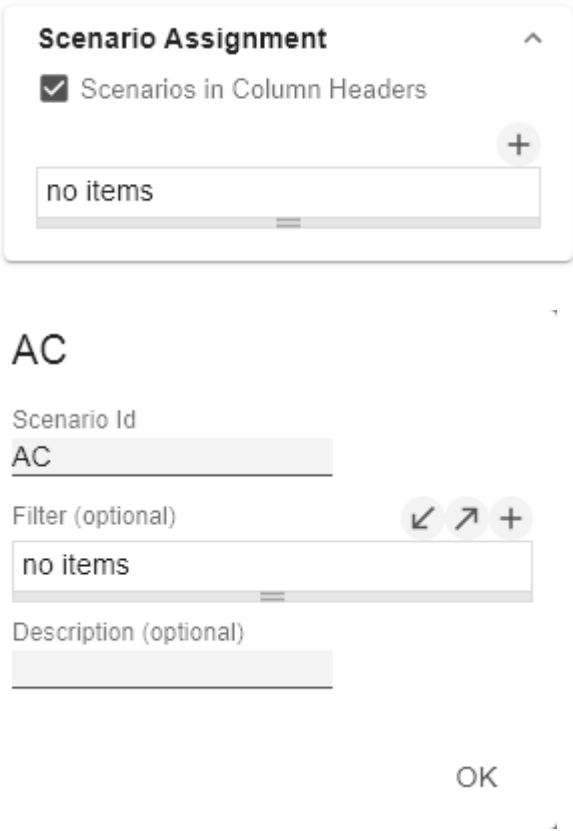


40

% px


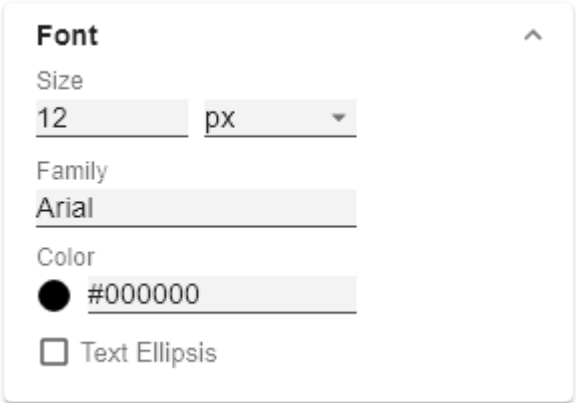
Font Weight

normal

OK

<p><b>Scenario Assignment</b></p> <p><i>Scenarios in Column Headers</i></p> <p>This property ensures that the scenarios are displayed as bars below the column headers.</p> <p>You can use the <b>+</b> sign to create assignments of scenarios to dimension members.</p> <p><i>Scenario Assignment Pop-Up</i></p> <p>This property assigns scenarios to data cells.</p> <p>Each configuration has the following properties:</p> <ul style="list-style-type: none"> <li>• <i>Scenario Id</i>: The ID of the scenario to be used. A scenario ID used here, has to be defined in the scenario definition.</li> <li>• <i>Filter</i>: The selected scenario is assigned for each dimension member that is selected here using the <b>+</b> sign.</li> <li>• <i>Description</i>: Short name describing the configuration to be recognizable.</li> </ul>	
<p><b>Data Selection</b></p> <p><i>Selection Type</i></p> <p>Specify how cells can be selected by the user. The following modes are available:</p> <ul style="list-style-type: none"> <li>• <i>None</i>: Cells can not be selected.</li> <li>• <i>Single</i>: Only a single cell can be selected at the same time</li> <li>• <i>Multi</i>: multiple cells can be selected using the CTRL key.</li> </ul>	
<p><b>License</b></p> <p><i>License Key</i></p> <p>Enter the license key here</p>	

## Labels Tab

<p><b>Title</b></p> <p><i>Title Text</i></p> <p>Enter the title for the matrix in this field. Multiple-line texts are reproduced accordingly, i.e. the line break is adopted.</p> <p><i>Size</i></p> <p>Enter the size of the title's font. Select a CSS unit from the list (such as px, em),</p>	 <p>The screenshot shows the 'Labels' configuration panel in the graphomate matrix application. At the top, there is a search bar and a navigation menu with icons for database, text, graph, and other features. The 'Labels' section is expanded, showing a 'Title' configuration card. This card includes an 'Enable' checkbox, a text input field containing 'Title Text', a 'Size' input field set to '14', and a unit dropdown menu set to 'px'.</p>
<p><b>Font</b></p> <p><i>Size</i></p> <p>Enter the size of the font. Select a CSS unit from the list (such as px, em),</p> <p><i>Family</i></p> <p>Define the global font. Clear the contents of the text box, and then choose <i>Arial</i>, <i>Tahoma</i>, <i>Verdana</i>, <i>Lucida Console</i> and <i>Calibri</i> from the suggested values. Alternatively, you can enter the name of a font installed on your system, even if no suggestions are displayed. For example, enter <i>Comic Sans MS</i>.</p> <p><i>Color</i></p> <p>This property defines the font color as HEX, RGB or HSL code. You can open a color picker by clicking on the colored circle and switch the color model by using the small arrows on the right. Alternatively, you can also use the color picker.</p> <p><i>Text Ellipsis</i></p> <p>When this option is selected, long character strings are not wrapped but abbreviated with three dots - e.g. electronic prod...</p>	 <p>The screenshot shows the 'Font' configuration panel in the graphomate matrix application. It includes a 'Size' input field set to '12' and a unit dropdown menu set to 'px'. Below that is a 'Family' input field containing 'Arial'. The 'Color' section features a black circle icon, a text input field with the hex code '#000000', and a 'Text Ellipsis' checkbox which is currently unchecked.</p>



## Value Format

With the Value Format you define the way the values are displayed in the matrix. You can define several formats and assign them to specific columns using filtering.

- Multiple Value Format Rules (Assignments) are prioritized in descending order, i.e. definitions that are lower in the list overwrite those above them when their filters overlap. Therefore, the generally valid format of the table should be defined at the top of this list without any further filters. Value Formats defined below, restricted by filters, overwrite the formatting defined above - "From General to Special".

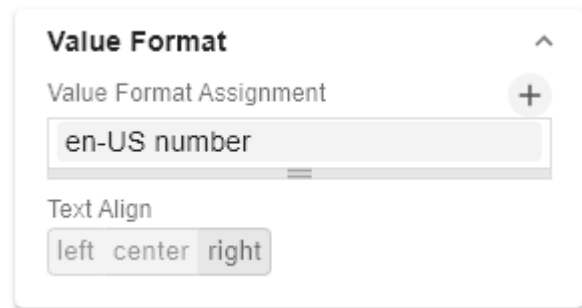
### Value Format Assignment

You can access the configuration by clicking on an element in the list. You define another Value Format by clicking on the **+** symbol.

### Value Format Pop-Up

Define the number format using the following options:

- Locale:** Defines abbreviations, decimal and thousand separators for the respective language. You can choose between *en*, *de*, *fr* and *auto*. If *auto* is selected, the Locale set in the respective host application is used.
- Format Type:** Defines the type of number output. You can choose between *number* (decimal number), *percent* (percentage) and *ordinal* (ordinal number).
- Abbreviations:** Defines the type of abbreviations. You can choose between *mean* (abbreviation most suitable for the mean value), *min* (abbreviation most suitable for the minimum value), *max* (abbreviation most suitable for the maximum value), *auto* (best-suited abbreviation for each respective number individually), *trillion* (trillion abbreviation), *billion* (billion abbreviation), *million*, *thousand* and *none* (no abbreviation at all). With this property you can, for example, ensure that numerical values are always displayed in thousands - e.g. 0.1k or 1000k.
- Negative Sign:** Defines how negative numbers are displayed. You can choose between *minus*, *parenthesis*, and *none* (no sign).
- Prefix:** The input value is placed before the number.
- Suffix:** The input value is placed after the number.
- Thousands Separator:** Replaces the thousand separator set by the selected *locale*.



- **Decimal Separator:** Replaces the decimal separator set by the selected *locale*.
- **Total Digits:** Defines how many digits the number may consist of. *Total Digits* is prioritized over *Decimal Digits*.
- **Decimal Digits:** Defines how many decimal places of the formatted number are displayed.
- **Scaling Factor:** The value of each data point is multiplied by the entered number to scale values.
- **Zero Format:** When the checkbox is activated, any data value equal to 0 (the number zero) gets replaced by the entered value.
- **Null Format:** Any data value that equals *NULL* (no value) gets replaced by the entered value.
- **Error Format:** If a data value is undefined or the result of an arithmetic error such as dividing by 0 (zero), the data value is replaced by the entered value.
- **Rounding Method:** Defines the rounding method. You can choose between *half up* (23.5 24, -23.5 -23), *commercial* (23.5 24, -23.5 -24) and *trim* (23.5 23, -23.5 23).
- **Explicit Positive Sign:** Defines whether a positive number should always be preceded by a + (plus sign).
- **Filter (optional):** By clicking in the empty list or on the + symbol, you can define one or more dimension members for which these format settings should apply. For example, you select a measure column using the dimension "measures" and the actual measure (e.g. "gross") of the column to be formatted.
- **Description:** Short name that describes the configuration to be recognizable

#### Text Alignment

Specify how text content is aligned in the matrix: left-aligned (left), centered (center) and right-aligned (right).

## en-US number

Locale  
en-US

Format Type  
number

Abbreviations  
auto

Negative Sign  
minus

Prefix  
\_\_\_\_\_

Suffix  
\_\_\_\_\_

Thousand Separator  
 \_\_\_\_\_

Decimal Separator  
 \_\_\_\_\_

Total Digits (approx.)  
 \_\_\_\_\_

Decimal Digits  
1

Scaling Factor  
1

Zero Format  
 \_\_\_\_\_

Null Format  
\_\_\_\_\_

Infinity Format  
∞

Rounding Method  
commercial

Explicit Positive Sign

Filter (optional) ↶ ↷ +  
no items

Description (optional)  
\_\_\_\_\_

OK

## Measures

Dimension

Measures ▼

Members

gross x ▼

OK

### Scripted Formatting

#### CFL Rules

Learning from the usage of our first table component - the graphomate tables - we decided to offer our customers a possibility to format the graphomate matrix very individually according to their ideas. The Cell Formatting Language (CFL) let you define rules which are executed for each cell of the matrix. These rules can be used to influence the display of cells based on cell properties, data properties or matrix properties. In this way, you can create a heat map, color elements, or apply conditional formatting from the graphomate matrix with a few lines of code.

#### ⓘ Cell Formatting Language:

The CFL is a script language for individual formatting of the graphomate matrix based on JavaScript syntax.

It allows to read from and write various properties to the global variable *cell* via *getter* and *setter*. A complete [API documentation](#) can be found [here](#).

To simplify the programming of the CFL, we provide a [web-based CFL editor](#) from which the defined rules can be easily copied and pasted into the script body. This editor and some [code templates](#) can be found [here](#).

For all CSS properties and values that can be set in the CFL, the [usual notations](#) apply.

#### CFL-Pop-Up

The following properties can be defined:

### Scripted Formatting ⤴

CFL Rules +

no items

CFL Variables +

no items

Custom CSS +

no items

## my cfl rule

Enabled

Name

my cfl rule

Script Body

Use our [online editor](#) and copy your CFL rule here

OK

- **Enabled:** This Boolean property makes it possible to (de)activate the rule.
- **Name:** A name that is used to identify the rule.
- **Script Body:** This String property contains the actual script in the CFL (Cell Formatting Language)

**i** You can find the CFL editor [here](#).

*CFL Variables*

At this point you can define your own variables that you want to use in a CFL rule. In The CFL Rule, the variable is accessed via the .getCflVariable method. The value of the variable must comply with the JSON format (examples: 5 or "center" or [1,2,3] or null or {"foo": "bar"}).

*CFL Variables Pop-Up*

The following properties can be defined:

- **Identifier:** Assign a unique name that can be referenced in a CFL rule.
- **Value:** The value of the variable must be according to the JSON format (examples: "car" for a string or 3.14159 for a numerical value).

*Custom CSS*

Use CSS code directly for the matrix if you cannot address complex selectors in the styling via the CFL.

*Custom CSS Pop-Up*

The following properties can be defined:

- **Enabled:** This boolean property allows to (de)activate the CSS snippet.
- **Name:** A name which is used to identify the CSS snippet.
- **CSS:** Here the CSS is inserted, which can consist of several CSS snippets.

:
↑

Identifier

Value

OK

---

my css
↑

Enabled

Name

CSS

OK

**Hierarchy Nodes**

Here you control the color and font style of the hierarchy nodes in the table.

*Color*

Here you define the font color of the Hierarchy Nodes. The color overwrites the general font Color from the Font group. Use the Color Picker or enter color values as HEX, RGB, or HSL code. You switch between these color models using the small arrows on the right side of the color picker.

### *Bold*

If you want hierarchy nodes to be displayed in bold, activate this property.

### *Italic*

If hierarchy nodes should be displayed in italics, activate this property.

### *Row Indentation*

Specify the size of the indentation of hierarchy nodes here. The indentation that is ultimately used is a multiple of the indentation set here and depends on the hierarchy level of the respective node. Select a CSS unit from the list (such as *px*, *em*).

### *Column Indentation*

Set the size of the indentation of columns here. The final indentation used is a multiple of the indentation set here, and is based on the hierarchy level of the node in question. Select a CSS unit (such as *px*, *em*) from the list,

### *Node Divider Thickness*

Set the thickness of the horizontal separator lines below cells whose rows represent hierarchy nodes. All other separators can be set in the tab *Axes*.

### *Extra Row Padding*

Set here the value of the additional line spacing that will be applied to result lines. Choose a CSS unit from the list (such as *px*, *em*),

### *Node Divider Color*

Here you can set the color of the horizontal separator lines below cells whose rows represent hierarchy nodes. All other separators can be set in the tab *Axes*.

### *Following Node Divider*

This setting determines whether lines before or after a hierarchy node are interpreted as a separator line of the hierarchy node. All other separators can be set in the tab *Axes*.

### *Collapsible*

If the hierarchy should be expandable and collapsible, activate the *Collapsible* property.

### *Collapsible On Whole Cell*

## Hierarchy Nodes

### Color

#000000

Bold

Italic

### Row Indentation

1,2 em

### Column Indentation

0,5 em

### Node Divider Thickness

0,1 em

### Extra Row Padding

0 em

### Node Divider Color

#D3D3D3

Node Divider

Following Node Divider

Collapsible

Collapsible On Whole Cell

If this property is activated, clicking anywhere into a cell causes the hierarchy node to expand or collapse. Selecting entire rows is not possible this way. If this property is inactive, only a click on the triangle causes the collapse, while a click on the rest of the cell only results in a selection of the row.

### Styling

#### *Matrix Background Color*

Determine the background color of the matrix using Color Picker or HEX, RGB or HSL code. You can switch this using the small arrows on the right side of the color picker.

#### *Matrix Padding*

This property determines the outer padding of the matrix component. Select a CSS unit (such as px, em) from the list.

**Styling** ^

Matrix Background Color

Matrix Padding

### Footer

#### *Footer Text*

Enter the Footer text for the matrix in this field. Multiple-line texts are reproduced accordingly, i.e. the line break is adopted.

#### *Size*

Enter the footer's font size. Select a CSS unit from the list (such as px, em),

**Footer** ^

Enable

Footer Text

Size

## Axes Tab

### Columns

#### *Default Width [px]*

At this point, define the default value for column width in px.

#### *Width Per Column [px]*

This property allows you to set an individual width for each column of the matrix. The specification is made as a list. The indices of the list correspond to the column indices in the table. The column at position 0 corresponds to the row titles. The width is specified in pixels. For a table with one row title column, two data columns and one calculation column, a sample list would look like this: [200, 0, 0, 300].

If the value 0 is set for one or more columns, the value of the property Default Width is used for these columns.

With the csv-button you have the possibility to enter the column widths as a list of comma separated values.

#### *Column Margins*

This property sets the distance between columns, in any CSS length unit.

#### *Supress Repeating Header*

If members repeat themselves consecutively in a column header row, this property can be used to display them only once in succession.

#### *Header Dividers*

Here you can set the visibility of the horizontal separator lines below column header cells.

#### *Header Divider Thickness*

Here you can set the thickness of the horizontal dividing lines of column header cells. Select a CSS unit from the list (such as px, em).

#### *Header Divider Color*

Here you set the color of the horizontal separator lines of column header cells as HEX, RGB or HSL code. You can switch this using the small arrows on the right side of the color picker, which can be opened by clicking on the colored circle.

The screenshot shows the 'graphomate matrix' application interface. At the top, there is a search bar and navigation icons for database, text, axes, bar chart, and table. The 'Axes' tab is selected, and a configuration panel for 'Columns' is open. The panel includes the following settings:

- Default Width [px]**: 120
- Width Per Column [px]**: 200 (with a 'CSV' button next to the input field)
- Column Margins**: 0,3 em
- Suppress Repeating Header**
- Header Dividers**
- Header Divider Thickness**: 0,1 em
- Header Divider Color**: #000000

## Rows

### *Suppress Repeating Row Header*

If members repeat themselves consecutively in a row header column, this property can be used to display them only once in succession.

### *Dividers*

Here you set the visibility of the horizontal separator lines below data cells and row header cells whose rows are leaves of a hierarchy. That includes all rows which are neither column headers nor hierarchy nodes.

### *Divider Thickness*

Set the thickness of the horizontal separator lines below cells whose rows are leaves in a hierarchy. That includes all rows which are neither column headers nor hierarchy nodes. Select a CSS unit from the list (such as px, em),

### *Divider Color*

Here you set the color of the horizontal separator lines below cells whose rows are leaves in a hierarchy. That includes all rows which are neither column headers nor hierarchy nodes. Set the color as HEX, RGB or HSL code. You switch this using the small arrows on the right side of the color picker which can be opened by clicking on the colored circle.

### *Initial Expand Level*

Here you can set the starting drilldown state of the row hierarchy. "0" only shows the root node on the initial loading of the matrix. You need to reload the matrix or reopen your dashboard in order to see the initial expand level applied.

### *Alternate Row Styling*

This property makes the rows of the matrix alternately white and light gray which makes it easier to perceive individual rows.

### *Crosstab-like Row Headers*

Activate this property to split up the row header's hierarchy levels into separate columns.

## Rows

Suppress Repeating Row Header

Dividers

Divider Thickness

0,05 em

Divider Color

#D3D3D3

Initial Expand Level

.....

Alternate Row Styling

Crosstab-like Row Headers



## Chart Specific Tab

### Deviation Charts

In this tab you configure visual elements like bar or pin charts in the graphomate matrix.

#### Bar Chart Assignment

This property determines which data should be displayed as an In-Cell Bar Chart type instead of a number. This can be both source data and calculated measures - tab *Data: Calculations*. This is a list, whereby each individual list element represents an independent configuration.

Click on the **+** sign or in the empty list to make settings for the bar charts.

#### Bar Chart Assignment Pop-Up

- *Scenario Id for Axis*: Sets a defined scenario for the axis.
- *Scenario Id for Bar*: Sets a defined scenario for the bar. Scenarios are defined on the first tab *Data*.
- *Labels*: determines whether the value of the cell should be displayed as a label next to the chart's bar.
- *Negative Value is Good*: To swap the meaning of negative and positive colors, activate this property.
- *Comparison Group ID*: All In-Cell-Bar Charts of a graphomate matrix with an identical Comparison Group ID - any string - are scaled in the same way.
- *Use Outlier Threshold*: Specify here whether the Outlier Thresholds should be applied to the scaling.
- *Positive Outlier Threshold*: Describes the upper limit value of the scaling. All values that are greater than this limit value are displayed as outliers and are not included in the scaling. The next lower value of the scale or total scale (if a Comparison Group is used) then determines the new maximum of the scaling.
- *Negative Outlier Threshold*: Describes the lower limit value of the scaling. All values that are smaller than this limit value are displayed as outliers and are not included in the scaling. The next larger value of the scale or total scale (if a Comparison Group is used) then determines the new minimum of the scaling.

The screenshot shows the 'Chart Specific' configuration panel for 'Deviation Charts'. It includes a search bar at the top, navigation icons for data, text, axes, charts, and settings. The 'Deviation Charts' section is expanded, showing two assignment lists: 'Bar Chart Assignment' (containing 'Bar Charts') and 'Pin Chart Assignment' (containing 'no items'). Below these are color settings: 'Default Good Color' set to #8cb400 and 'Default Bad Color' set to #ff0000. The 'Label Size' is set to 0,7 em.

- *Filter(optional, Pop-Up)*: By clicking in the empty list or on the **+** symbol, you can define one or more dimension members for which the bar charts should be displayed. You could, for example, select the dimension "measures" and the member "Revenue" to display bar charts in all columns representing the measure "Revenue".
- *Description*: Short name that describes the configuration to be recognizable.
- *Use Specific Good Color*: If this setting is activated, the general default color value of the deviation charts (*Default Good Color*) for this bar chart configuration will be overwritten with the value selected in this configuration.
- *Good Color*: Here you can set the color for positively evaluated deviations by clicking on the associated color field using the color picker or as HEX, RGB or HSL code.
- *Use Specific Bad Color*: If this setting is enabled, the general default color value of the deviation charts (*Default Bad Color*) for this bar chart configuration will be overwritten with the value selected in this configuration.
- *Bad Color*: Here you can set the color for negatively evaluated deviations by clicking on the associated color field using the color picker or as HEX, RGB or HSL code.

#### Pin Chart Assignment

This property determines which data should be displayed as an In-Cell Pin Chart type instead of a number. This can be both source data and calculated measures - tab *Data: Calculations*. This is a list, whereby each individual list element represents an independent configuration.

Click on the **+** sign or in the empty list to make settings for the pin charts.

#### Pin Chart Assignment Pop-Up

- *Scenario Id for Axis*: Sets a defined scenario for the axis.
- *Scenario Id for Pin*: Sets a defined scenario for the pin. Scenarios are defined on the first tab *Data*.
- *Labels*: determines whether the value of the cell should be displayed as a label next to the chart's pin.
- *Apply Scenario Color to Pin Head*: If this setting is activated, the color of the defined scenario is used for the pin head.
- *Pin Line on Top*: Displays the line of the needle in the foreground (in front of the needle head).

## Bar Charts

Scenario Id for Axis

Scenario Id for Bar

Labels

Negative Value is Good

Comparison Group Id

Use Outlier Threshold

Positive Outlier Threshold

Negative Outlier Threshold

Filter (optional)




Description (optional)

Use Specific Good Color

Good Color

Use Specific Bad Color

Bad Color

OK

- **Negative Value is Good:** To swap the meaning of negative and positive colors, activate this property.
- **Comparison Group ID:** All In-Cell-Pin Charts of a graphomate matrix with an identical Comparison Group ID - any string - are scaled in the same way. In a later release this will also be possible across multiple graphomate matrix instances.
- **Use Outlier Threshold:** Specify here whether the Outlier Thresholds should be applied to the scaling.
- **Positive Outlier Threshold:** Describes the upper limit value of the scaling. All values that are greater than this limit value are displayed as outliers and are not included in the scaling. The next lower value of the scale or total scale (if a Comparison Group is used) then determines the new maximum of the scaling.
- **Negative Outlier Threshold:** Describes the lower limit value of the scaling. All values that are smaller than this limit value are displayed as outliers and are not included in the scaling. The next larger value of the scale or total scale (if a Comparison Group is used) then determines the new minimum of the scaling.
- **Filter(optional, Pop-Up):** By clicking in the empty list or on the **+** symbol, you can define one or more dimension members for which the pin charts should be displayed. You could, for example, select the dimension "measures" and the member "Revenue" to display pin charts in all columns representing the measure "Revenue".
- **Description:** Short name that describes the configuration to be recognizable.
- **Use Specific Good Color:** If this setting is activated, the general default color value of the deviation charts (*Default Good Color*) for this pin chart configuration is overwritten with the value specified in this configuration.
- **Good Color:** Here you can set the color for positively evaluated deviations by clicking on the associated color field using the color picker or as HEX, RGB or HSL code.
- **Use Specific Bad Color:** If this setting is enabled, the general default color value of the deviation charts (*Default Bad Color*) for this pin chart configuration will be overwritten with the value specified in this configuration.
- **Bad Color:** Here you can set the color for negatively evaluated deviations by clicking on the associated color field using the color picker or as HEX, RGB or HSL code.

*Default Good Color*

## Pin Charts

Scenario Id for Axis

Scenario Id for Pin

Labels

Apply Scenario Color to Pin Head

Pin Line on Top

Negative Value is Good

Comparison Group Id

Use Outlier Threshold

Positive Outlier Threshold

Negative Outlier Threshold

Filter (optional)



no items

Description (optional)

Pin Charts

Use Specific Good Color

Good Color

#8cb400

Use Specific Bad Color

Bad Color

#ff0000

OK

Here you can set the color for positive connoted values by clicking on the corresponding colored circle to open the color picker.

#### *Default Bad Color*

Here you can set the colors for negatively connoted values by clicking on the corresponding colored circle to open the color picker.

#### *Outlier Style*

Here you can select how outliers are displayed. In *SHORT* mode, the outliers are displayed as small triangles on the axis. In *LONG* mode, however, the outliers are displayed over the entire available area according to IBCS rules.


#### *Label Size*

Enter the size of the font in the deviation charts. Choose a CSS unit (such as *px*, *em*) from the list.

### **Background Bars**

#### *Background Bar Assignment*

This property determines which data should be displayed as an In Cell Background Bar instead of a number. This is a list, whereby each individual list element represents an independent configuration.

Click on the  sign or in the empty list to make settings for the background bars.

#### *Background Bar Assignment Pop-Up*

### Background Bars ^

Background Bar Assignment +

no items

Default Opacity

Default Good Color

Default Bad Color

Background Bar Negative Right to Left

- **Scenario Id:** Sets the defined scenario for the background bar. Scenarios are defined on the first tab *Data*.
- **Negative Value is Good:** To swap the meaning of negative and positive colors, activate this property.
- **Comparison Group ID:** All background bars of a graphomate matrix with an identical Comparison Group ID - any string - are scaled the same way. In a later release this will be possible across multiple graphomate matrix instances.
- **Use Outlier Threshold:** Specify here whether the Outlier Thresholds should be applied to the scaling.
- **Positive Outlier Threshold:** Describes the upper limit value of the scaling. All values that are greater than this limit value are displayed as outliers and are not included in the scaling. The next lower value of the scale or total scale (if a Comparison Group is used) then determines the new maximum of the scaling.
- **Negative Outlier Threshold:** Describes the lower limit value of the scaling. All values that are smaller than this limit value are displayed as outliers and are not included in the scaling. The next larger value of the scale or total scale (if a Comparison Group is used) then determines the new minimum of the scaling.
- **Filter(optional, Pop-Up):** By clicking in the empty list or on the **+** symbol, you can define one or more dimension members for which the background bars should be displayed. You could, for example, select the dimension "measures" and the member "Revenue" to display pin charts in all columns representing the measure "Revenue".
- **Description:** Short name that describes the configuration to be recognizable.
- **Use Specific Good Color:** If this setting is activated, the general default color value of the In-Cell bars (*Default Good Color*) for this chart configuration is overwritten with the value specified in this configuration.
- **Good Color:** Here you can set the color for positively evaluated deviations by clicking on the associated color field using the color picker or as HEX, RGB or HSL code.
- **Use Specific Bad Color:** If this setting is enabled, the general default color value of the In-Cell bars (*Default Bad Color*) for this pin chart configuration will be overwritten with the value specified in this configuration.
- **Bad Color:** Here you can set the color for negatively evaluated deviations by clicking on the associated color field using the color picker or as HEX, RGB or HSL code.

## Background Bar Charts

Scenario Id

Negative Value is Good

Comparison Group Id

Use Outlier Threshold

Positive Outlier Threshold

1000

Negative Outlier Threshold

-1000

Filter (optional)



no items

Description (optional)

Background Bar Charts

Use Specific Good Color

Good Color

#4dacc6

Use Specific Bad Color

Bad Color

#c6674d

Opacity

0.3

OK

#### *Default Opacity*

This value determines to what extent the in-cell bars should be hidden. The value starts at 0.0 (completely hidden) and goes up to 1.0 (completely visible). Values in between make the bars appear semitransparent.

#### *Default Good Color*

Here you can set the color for positive connoted values of background bar cells by clicking on the corresponding colored circle to open the color picker.

#### *Default Bad Color*

Here you can set the color for negative connoted values of background bar cells by clicking on the corresponding colored circle to open the color picker.

#### *Background Bar Negative Right To Left*

If this property is active, background bars representing a negative value start at the right edge of the cell.

### **General Charting**

#### *Outlier Style*

Here you select how accurately outliers are displayed. In *Short* mode, the outliers are displayed as small triangles on the axis. In *Long* mode, on the other hand, the outliers are displayed over the entire available area - in accordance with the rules according to IBCS.

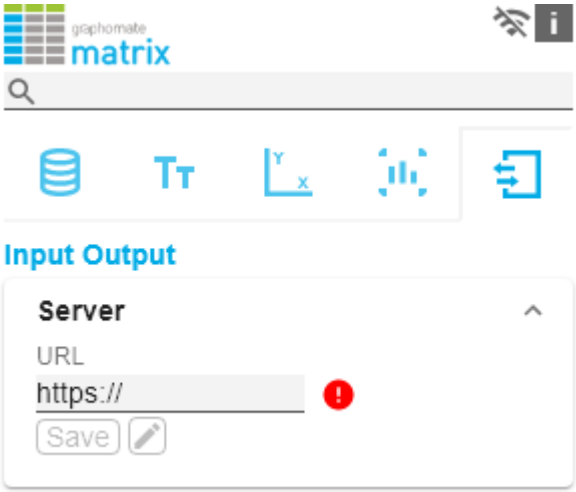
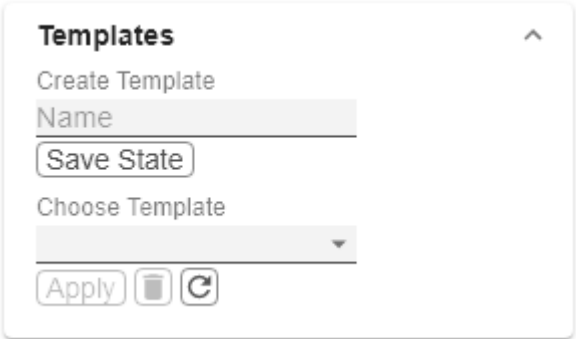
### **General Charting** ^

Outlier Style

LONG SHORT

## Input Output Tab

The functions of this tab are used to exchange templates for the graphomate matrix. Connect to the graphomate server - a free component of graphomate GmbH - to store or load a graphomate matrix template. This way you can exchange preconfigured graphomate matrix designs between BI frontends that support the graphomate server. Currently these are: Power BI, Tableau, Excel, Lumira Designer, Web Intelligence, SAP UI5, SAC.

<p><b>Server</b></p> <p>Here you enter the URL of the graphomate server to which the component should connect and from which you want to save or retrieve templates.</p> <p>If you have entered the URL to the server, a green check mark indicates that a connection could be established.</p> <p>If another server is used later, the button next to the save button can be pressed and the server URL can be edited.</p> <p>The hyperlink "<i>Admin</i>" allows you to jump to the admin area of the graphomate server.</p>	 <p>The screenshot shows the 'graphomate matrix' logo at the top. Below it is a search bar and a row of icons representing different BI tools: a database cylinder, 'Tt', a coordinate system, a bar chart, and a document icon. The 'Input Output' section is expanded, showing a 'Server' sub-section with a 'URL' field containing 'https://', a red error icon, and a 'Save' button with an edit icon.</p>
<p><b>Templates</b></p> <p>If the current settings are to be saved as a template, a new template name can be entered in the input field labeled <i>Create Template</i> and confirmed by clicking the <i>Save State</i> button. If the entered name complies with the naming convention, the template is saved on the server and a toast with the corresponding message is displayed in the lower part of the <i>graphomate property sheet</i>. However, if the entered name does not meet the expected naming conventions, an error message with the permitted characters is displayed accordingly.</p> <p>With <i>Choose Template</i> templates stored on the server can be retrieved and applied. To do this, the desired template must only be selected and the <i>Apply</i> button must be pressed. If you want to delete a template, you have to select the template in the list and press the <i>Delete (bin symbol)</i> button. If changes have been made to the templates on the server side, you have to click on the <i>Refresh</i> button. Changes should then be visible.</p>	 <p>The screenshot shows the 'Templates' section expanded. It contains a 'Create Template' section with a 'Name' input field, a 'Save State' button, and a 'Choose Template' section with a dropdown menu, an 'Apply' button, a delete icon, and a refresh icon.</p>

### Editability

With the Editability function it is possible that certain cell areas of a graphomate matrix can be edited at runtime. For this setting you use the *Editability Assignment*.

#### *Editability Assignment Pop-Up*

- *Editable*: This Boolean property allows to (de)activate the rule.
- *Filter (optional)*: A list of filter objects. Each filter object can restrict a dimension to certain members. Only data corresponding to the members specified for the dimensions selected in the filter will be editable.
- *Description (optional)*: Defines a description for the set configuration.

**Editability** ^

Editability Assignment +

all cells

**all cells**

Editable

Filter (optional) ← → +

no items

Description (optional)

all cells

OK



## Default values

Here you will find the default values of the preset Scenarios. Copy the character string and paste it back into the *Data* tab in the relevant *Import/Export* area.

**Scenarios (AC, FC, PP, BU):**

W3sic2hvcnQioiJBQylslmNvbG9yljoiIzlyMjlyMlslmZpbGx0eXBlljoiZmlsbGVkIiwic2hhcGUioiJyZW50IiwidGhpY2tuZXNzljoxLCJiYXJ3aWR0aCI6MC40LCJwaW53aWR0aCI6MC4yNSwiZm9udHdlaWdodCI6Im5vcm1hbCJ9LHsic2hvcnQioiJQUClslmNvbG9yljoiIzgwODA4MCIslmZpbGx0eXBlljoiZmlsbGVkIiwic2hhcGUioiJyaG9tYilslmNvbG9ybnVzcyI6MSwiYmFyd2lkdGgiOjAuNCwicGlud2lkdGgiOjAuMjUslmZvbnR3ZWlnaHQoIoiJub3JtYWwifSx7InNob3J0IjoiIiUlcjJb2xvcil6IiMwMDAwMDAiLCJmaWxsZHIwZSI6ImVtcHR5Iiwic2hhcGUioiJjaXJjbGUlcjJ0aGlja25lc3MiOjEslmJhcndpZHRoljowLjQslmNvbG9ybnVzcyI6MSwiZm9udHdlaWdodCI6Im5vcm1hbCJ9XQ==

## Known Issues (matrix)

- The performance of the virtual scrolling technology is negatively influenced by browser extensions that react to changes in the HTML structure. We have noticed this, for example, with ad blockers or some extensions to enlarge thumbnails.

## Known Issues (SAC)

- SAP has not yet released the data binding via the SDK of SAC, which is why a short script for data binding at runtime is required. See *Quickstart*.