Create apps and visualizations

Qlik Sense®
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Contents

1 About this document

Visualizations are used to present the data that is loaded into the app. The selections you make in the app are reflected in all associated visualizations on all sheets.

Read and learn how to create and customize sheets and visualizations in your app. You will also learn about creating reusable master items, and about expressions in visualizations.

This document is derived from the online help for Qlik Sense. It is intended for those who want to read parts of the help offline or print pages easily, and does not include any additional information compared with the online help.

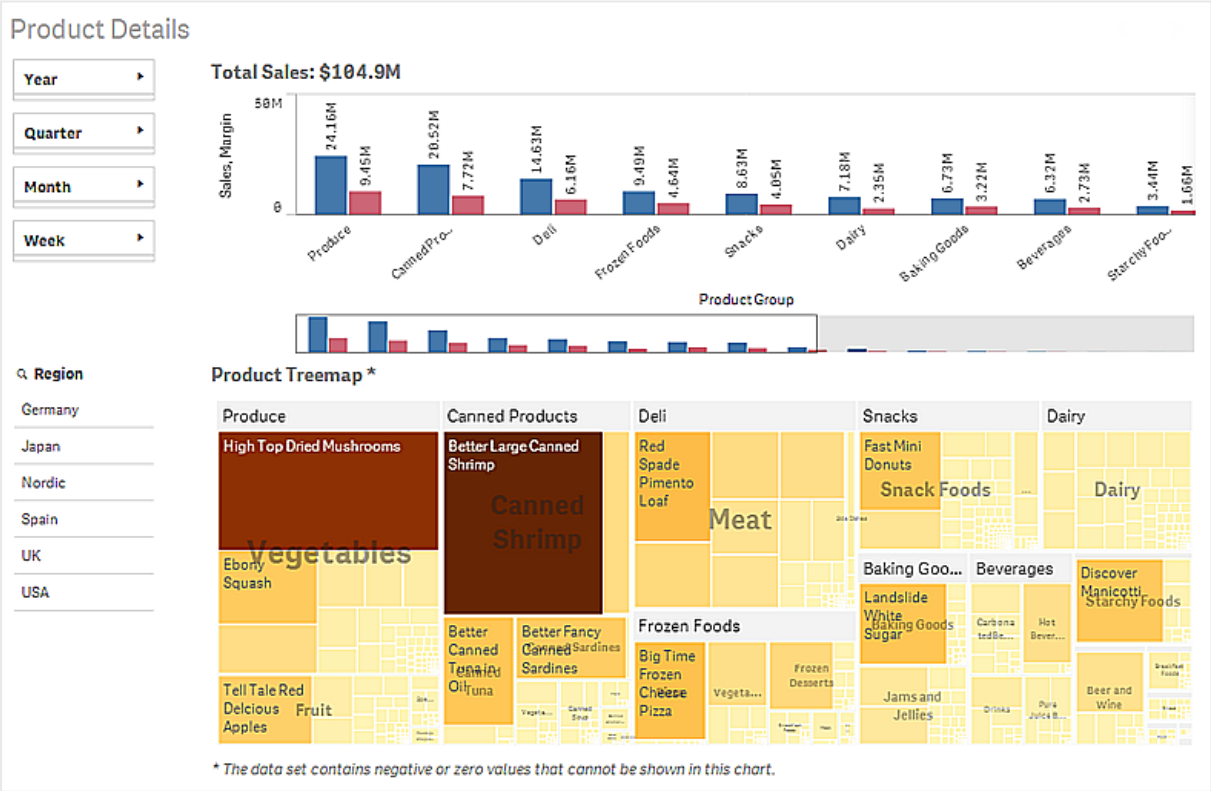
You find the online help, additional guides and much more at help.qlik.com/sense.

2 Creating apps and visualizations

With Qlik Sense you can design and create interactive apps consisting of a number of sheets containing visualizations of your data. Visualizations can be created from charts (such as bar charts, pie charts, tables, gauges, and treemaps), and also custom objects created using tools in the Qlik Sense Dev Hub. Visualizations are straightforward to add and customize. Interactivity, such as drill-down and filtering, is built in because Qlik Sense automatically highlights items associated with your selections. You can enhance interactivity further with functionality specific to the different visualizations.

While building visualizations on sheets, consider some rules of thumb:

- Consistency helps the user to navigate and understand the app.
- Keep the sheet tidy and let the data visualization play center stage.
- Focus on a few metrics (KPIs) per sheet and present these in priority order.
- Supportive information, like comparison metrics, should be available but separate from the key metrics.
- Make sure that the user can drill-down in data. For example, create dimensions for time and date to make it easy to drill down in year, month, week and day.
- Avoid using red and green colors as indicators because these colors can be hard for users with color-vision deficiency to distinguish.



An example of a sheet with four different charts.

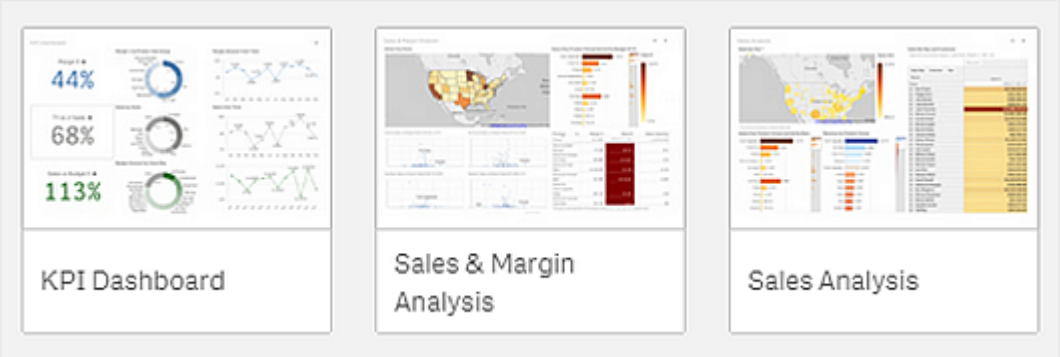
You can get a lot of good inspiration by checking out the demo apps:

Qlik® Sense Demos

3 Structuring an app using sheets

Sheets provide a way of structuring your ideas and purposes for your app. When you create an empty app, it is good practice to first build a structure of empty sheets, where each sheet represents an idea or a goal. This will give you, and others who you will share your app with, a good overview of the app.

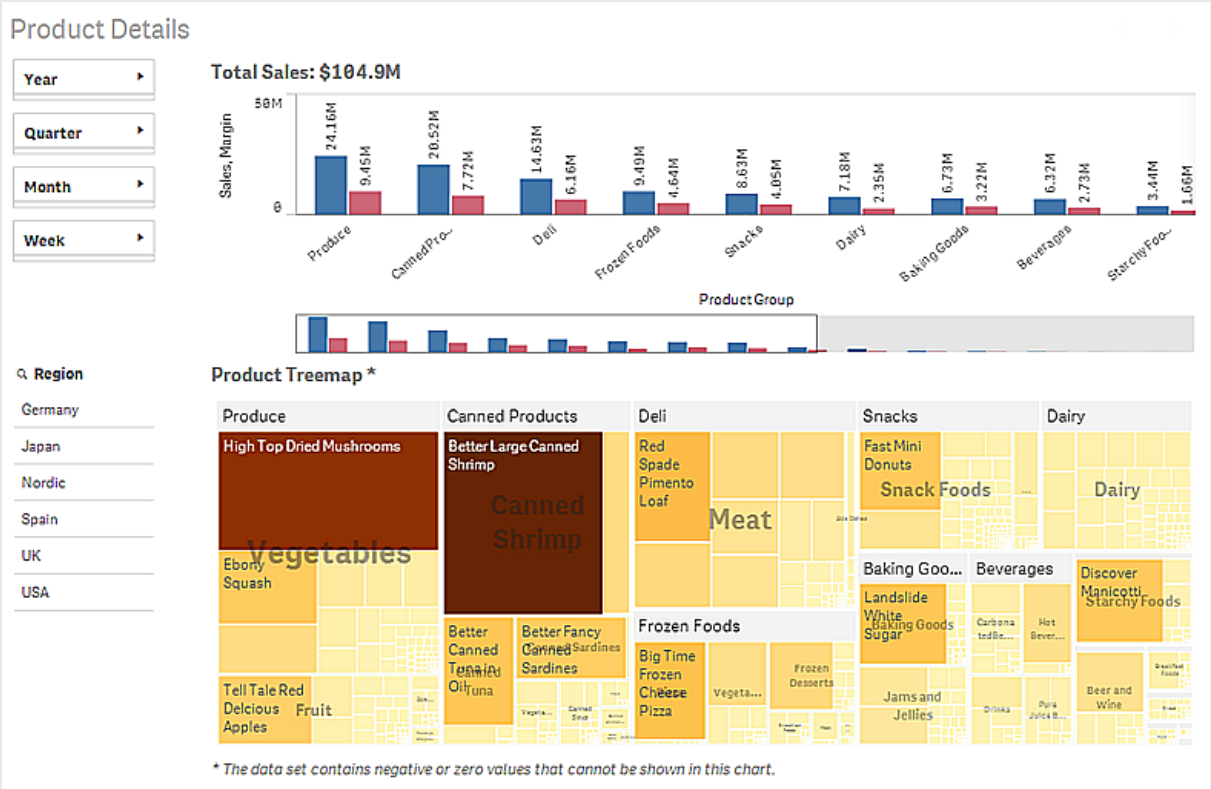
For example, let us say that you want an overview of your business's key metrics, view sales and margins by state, region and product, and also sales by city and salesperson. Instead of having all this information in one place, you could structure it by having one sheet for each of these purposes.



Each sheet has a purpose and an idea of its own

A sheet is where charts and tables for data visualization are placed. An app can include one or several sheets.

The selections that you make affect visualizations regardless of which sheets they are located on.



An example of a sheet with boxes on the left to select and filter out the data to be presented in the visualizations on the right.

3.1 Creating a new sheet

You can create a new sheet to the app from the app overview or from the sheet navigator.

Do the following:

1. From the app overview, click to view the sheets.
2. Click or **Create new sheet**.
3. Give your sheet a title and add a description.
4. Click outside the text area to save the title and description.

A new sheet is created.

> *You access the sheet navigator from the sheet view by clicking in the toolbar.*

3.2 Changing the title and description of a sheet

You can change the title and description of your sheets. You can either use a fixed sheet title, or a dynamic sheet title based on an expression.

Do the following:

1. In the app overview, click to view the sheets.
2. Do one of the following:
   - If you are in grid view, , click the sheet title followed by clicking .
   - If you are in list view, , click .
3. Edit **Title** and **Description**.
4. Click outside the text area.

The changes you made are saved.

You can also change a sheet's title and description in the properties panel.

Using a dynamic sheet title

You can also set a dynamic sheet title based on an expression in the **Title expression** property of the sheet properties panel. You can use any valid chart expression.

*If you set a dynamic sheet title, the fixed title (**Title**) is not used.*

3.3 Changing the thumbnail of a sheet

You can replace the default thumbnail of a sheet with another thumbnail, to make it easier to distinguish between sheets in the app overview and in the sheet navigator. You can use one of the default images, or an image of your own.

Do the following:

1. In the app overview, click to view the sheets.
2. Do one of the following:
   - If you are in grid view, , click the sheet title followed by clicking .
   - If you are in list view, , click .
3. Click on the default thumbnail.
   The **Media library** opens.
4. Click on a folder in the media library, for example **In app** or **Default**.
5. Select the image you want to use as a thumbnail for the sheet and click **Insert**.
6. Click to stop editing.

The image you selected is now used as a thumbnail for the sheet, and is visible in the sheet navigator and in the app overview.

You can also change a sheet's thumbnail in the sheet navigator at the top right or in the properties panel.

The optimal aspect ratio of a thumbnail is 8:5 (width:height).

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You can upload images to the **In app** folder in the media library. You need to use the Qlik Management Console to upload images to the default folder.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

You can only add or change the thumbnail of an unpublished sheet.

3.4 Copying, replacing and moving items on sheets

You can copy, replace and move items on a sheet and between sheets. You can do this in the following ways:

- Using the edit bar on the sheet (, and).
- Using the shortcut menu options **Cut**, **Copy** and **Paste** (or **Paste and replace**).
- With the keyboard shortcuts Ctrl+C, Ctrl+X and Ctrl+V.

Copying items

Follow this procedure when you want to make a copy of an existing item.

Do the following:

1. While editing a sheet, click on the item you want to copy.
   The item is highlighted.
2. On the edit bar, click .
3. To insert the item on another sheet, navigate to the sheet via the sheet navigator.
4. Click to paste the item.

The copied item is added to the sheet.

If there is no empty space on the sheet, then the largest item will reduce in size by half to make space for the copied item.

Replacing items

Follow this procedure when you want to replace an existing item with the one you have just copied.

Do the following:

1. While editing a sheet, click on the item you want to copy.
   The item is highlighted.
2. On the edit bar, click .
3. Click on the item you want to replace.
   The item is highlighted.
4. Click to replace the highlighted item with the copied one.

The copied item replaces the highlighted one.

If you want to deselect the visualizations on the sheet, press Esc.

Moving items to another sheet

To move an item between two sheets you first cut it out from one sheet and then paste it onto another sheet.

Do the following:

1. While editing a sheet, click on the item you want to move from one sheet to another.
   The item is highlighted.
2. On the edit bar, click .
   The item is deleted from the sheet.
3. Navigate to the sheet you want to move the item to.
4. Click to paste the item.

The moved item is added to the other sheet.

3.5 Duplicating a sheet

You can duplicate any sheet, regardless of whether it is a sheet that belongs to the app or a sheet you have created yourself. The purpose of duplicating sheets is to save time by reusing content, and to allow you to modify the duplicate so that it fits your needs better.

A duplicated sheet contains the same visualizations as the original sheet, and is linked to the same master items. The duplicated sheet is a standalone sheet with no connection to the original sheet. Duplicated sheets appear under **My sheets** in app overview and in the sheet navigator.

Duplicating a sheet from app overview

Do the following:

1. Click to show the sheets in the app.
2. Long-touch/right-click a sheet.
   The shortcut menu opens.
3. Click **Duplicate**.

The new sheet is created, and you find it under **My sheets**.

> *You can also duplicate a sheet from the global menu in app overview or in sheet view, or, when in sheet view, using the sheet navigator.*

3.6 Renaming a sheet

You can rename your sheets in the app overview.

Renaming a sheet in grid view

Do the following:

1. If you are in grid view, , click the sheet title followed by clicking .
2. Change the title.
3. Click ✔ to stop editing.

The new title is saved.

Renaming a sheet in list view

Do the following:

1. If you are in list view, , click .
2. Change the title.
3. Click ✔ to stop editing.

The new title is saved.

3.7 Deleting a sheet

You can delete sheets from the app overview.

Deleting a sheet in grid view

Do the following:

1. If you are in grid view, , click the sheet title followed by clicking .
2. Click .
3. To confirm that you want to delete the sheet, click **Delete** in the dialog.

The sheet is deleted.

Deleting a sheet in list view

Do the following:

1. If you are in list view, , click .
2. Click .
3. To confirm that you want to delete the sheet, click **Delete** in the dialog.

The sheet is deleted.

*In grid view as well as in list view, you can also long-touch/right-click on a sheet and select **Delete**.*

4 Designing visualizations

4.1 The purpose

The point of a visualization is to communicate its data in a quick and meaningful way while remaining 100 percent accurate. A visualization should serve a clear purpose and not overwhelm the users with unnecessary details. If possible, a visualization should be designed to encourage the users to compare its various elements so as to give insight into the meaning behind the data.

So, to design a data visualization to get its message through, you need to first understand the data itself. Then use well-known design patterns and use the type of visualization that reveals the data in the best way.

4.2 Understand the data

To design an effective visualization with a clear purpose, you should thoroughly understand your data. The following points will help you find the information you want to convey with your data:

- What kind of data is it? Nominal, ordinal, interval, or ratio data?
- How different parts of the data relate to each other?
- Can you organize the data in a way that makes it easy for you to create your visualizations?
- What do you want to communicate with your data?

It's easy to start thinking about how the visualization should look, but when you have answered these questions it will be easier to decide what kind of visualization you should use and how it will look and communicate its data.

4.3 Use well-known design patterns

When you have understood the data, how it is organized, and how its parts relate to each other, you should consider using well-known design patterns to communicate your data. For example, if you want to show how a measure behaves over time, you should use a line chart because its strength is that it tells your users a lot without their having to look at the specific details.

See: *When to use what type of visualization (page 199)*

4.4 Design individual elements to reveal the data

Apart from the design pattern you choose, an effective visualization is also about how you design and make individual data elements stand out and reveal the data. In other words, the design of the individual elements of a visualization should reveal the data to your users in a quick and intuitive way. An easy way of achieving this is to use a different color on one of the dots in a group of many dots. The different color makes it much easier for you to find the dot and reduces your load of information. Other examples of intuitive design are:

- Position
- Orientation

- Size
- Shape
- Color hue, brightness and saturation

4.5 Avoid the pitfalls of data visualization

To experience the benefits of data visualizations you must avoid the pitfalls. Here are some common pitfalls:

Color abuse

Do not overdo colors. Be aware that the wrong color in the wrong place might cause confusion rather than clarity.

Misuse of pie charts

Avoid having pie charts side by side to compare. Try not to squeeze too much information into them.

Visual clutter

Too much information defeats the purpose of clarity. Use a maximum of nine KPIs and remove all visual clutter.

Poor design

A beautiful visualization is not necessarily the most effective. Use design best practices at all times.

Bad data

Spot and correct issues with your data before you present it. Do not let your visualization take the blame for bad information.

4.6 Visualizations

You can use visualizations to present the data that is loaded into the app. For example, you can show a bar chart to compare sales numbers for different regions, or show a table with precise values for the same data.

The selections you make in a visualization are reflected in all associated visualizations on all sheets.

Creating a visualization

You create visualizations from pre-defined charts or custom objects. You must be in **Edit** mode to be able to add a visualization to the sheet.

1. Drag the visualization from the assets panel onto the sheet, or double-click the visualization.
2. Add dimensions and measures to the visualization. The number of dimensions and measures that are required depends on which visualization you selected.
   Dimensions determine how the data in a visualization is grouped - for example total sales per country or number of products per supplier.

Measures are calculations used in visualizations, typically represented on the y-axis of a bar chart or a column in a table. Measures are created from an expression composed of aggregation functions, such as **Sum** or **Max**, combined with one or several fields.

3. Adjust the presentation, for example sorting, coloring, or labeling.

You can convert from one visualization type to another by dragging a new chart to a visualization on a sheet.

Reusing a visualization

If you have created a visualization that you want to reuse in other sheets of the app, you can save it as a master visualization. You can only create master visualizations in an unpublished app. When the app is published, all users can add the visualization to their own sheets, but not modify it.

> *Right-click on a visualization and select* ***Add to master items*** *to save it as a master visualization.*

You can find master visualizations under (master items) in the assets panel.

Which visualizations are available?

There are two basic types of visualizations available in the assets panel of Qlik Sense.

- Charts illustrate the data with visual elements like bars, lines, or points.
- Text-based visualizations presents data in text form, for example, tables or filters.

The best choice of chart type depends on the purpose of the visualization.

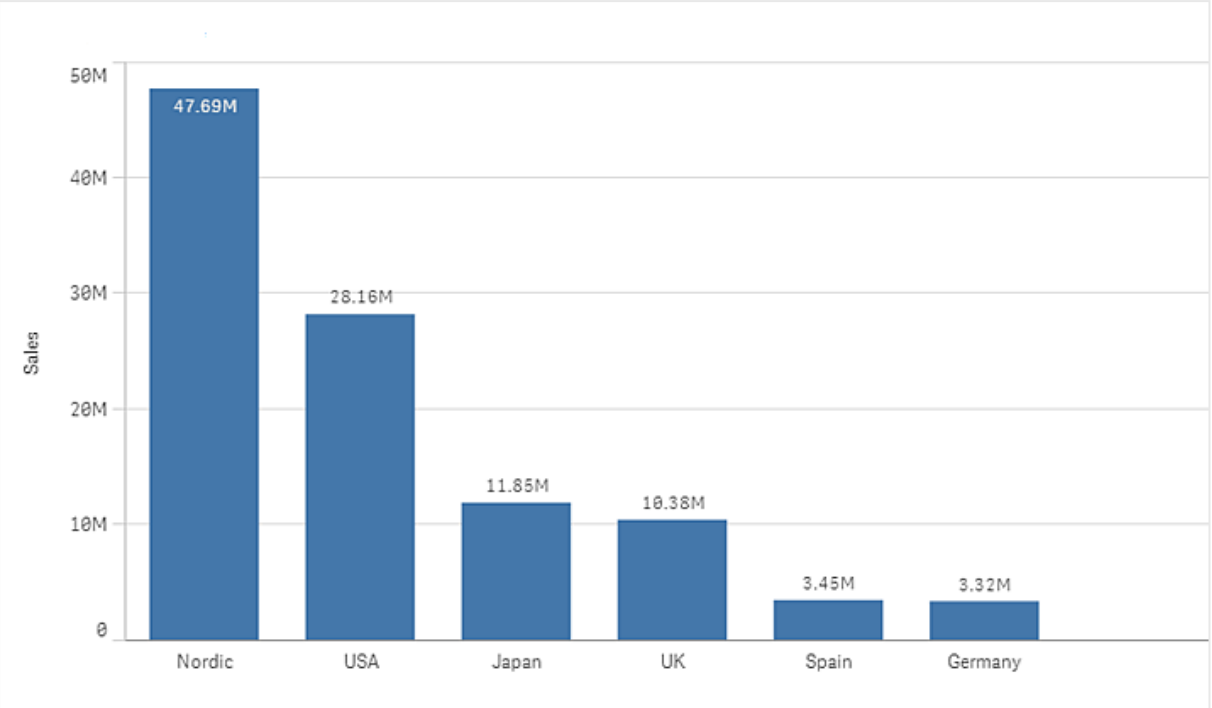
If the pre-defined visualizations does not fill your purpose, you can use a visualization extension or a widget. You find them in the assets panel under (**Custom objects**).

	Charts	
	Bar chart	The bar chart displays a bar for each dimension value. The bar length corresponds to its numerical measure value.
	Box plot	The box plot is suitable for comparing range and distribution for groups of numerical data, illustrated by a box with whiskers, and a center line in the middle.
	Combo chart	The combo chart combines bars and lines in the same chart. The bars and lines have different axes to enable comparing percentages and sums.
	Distribution plot	The distribution plot is suitable for comparing range and distribution for groups of numerical data. Data is plotted as value points along an axis.
	Gauge	The gauge is used to display the value of a single measure, lacking dimensions.

	Histogram	The histogram is suitable for visualizing distribution of numerical data over a continuous interval, or a certain time period. The data is divided into bins.
	Line chart	The line chart displays data lines between values. Line charts are often used to visualize a trend in data over intervals of time.
	Map	The map is used to combine geospatial data and measure values, such as the sales for a region or a store.
	Pie chart	The pie chart shows the relation between a single dimension and a single measure.
	Scatter plot	The scatter plot presents values from two measures. This is useful when you want to show data where each instance has two numbers, for example, country (population and population growth). An optional third measure can be used and is then reflected in the size of the bubbles. When showing large data sets colors will be used instead of bubble size to represent the measure size.
	Treemap	The treemap shows hierarchical data. A treemap can show a large number of values simultaneously within a limited space.
	Waterfall chart	The waterfall chart illustrates how an initial value is affected by intermediate positive and negative values.
	Text-based visualizations	
	Filter pane	The filter pane allows you to control what data that is shown in the visualizations on a sheet. A filter pane can filter the data of several dimensions at once.
#1	**KPI**	The KPI is used to present central performance figures. You can add a link to a sheet.
	Pivot table	The pivot table presents dimensions and measures as rows and columns of a table. The pivot table allows you to analyze data in multiple dimensions at a time. The data in a pivot table may be grouped based on a combination of the dimensions, and partial sums can be shown.
	Table	The table displays values in record form, so that each row of the table contains fields calculated using measures. Typically, a table includes one dimension and multiple measures.
A	**Text & image**	You can use the text & image visualization to add text, images, measures and links to a webpage.

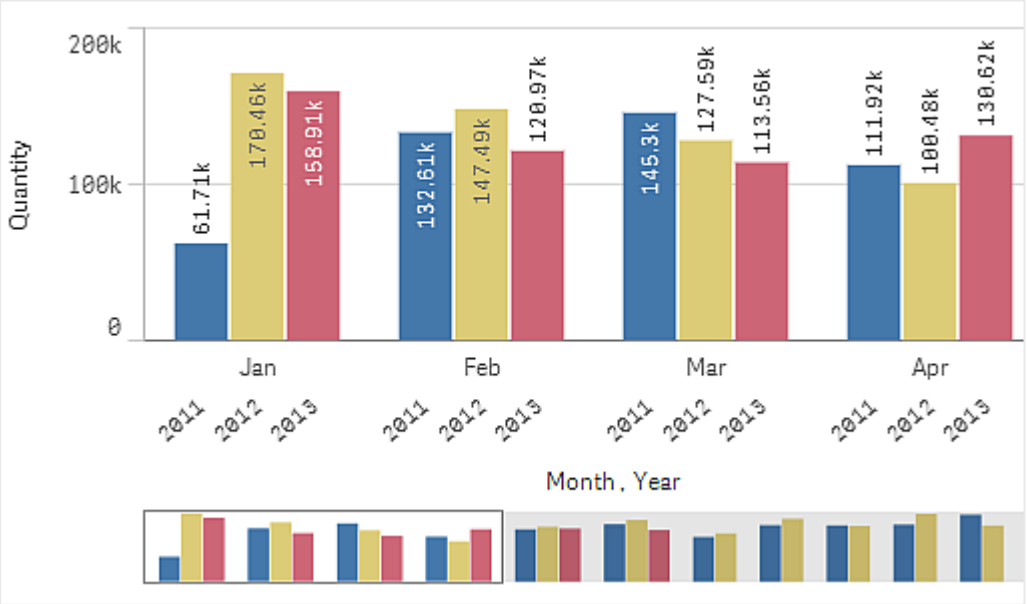
Bar chart

The bar chart is suitable for comparing multiple values. The dimension axis shows the category items that are compared, and the measure axis shows the value for each category item. In the image, the dimension values are different regions: Nordic, USA, Japan, UK, Spain, and Germany. Each region represents a dimension value, and has a corresponding bar. The bar height corresponds to the measure value (sales) for the different regions.

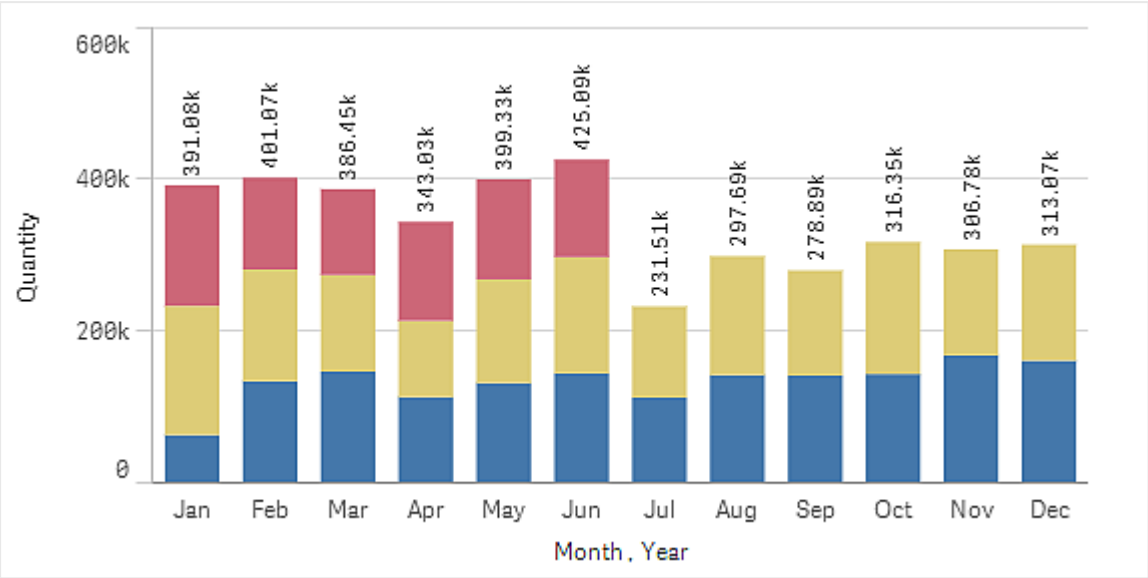


You can make more complex comparisons of data by using grouped or stacked bars. This requires using two dimensions and one measure. The two example charts use the same two dimensions and the same measure.

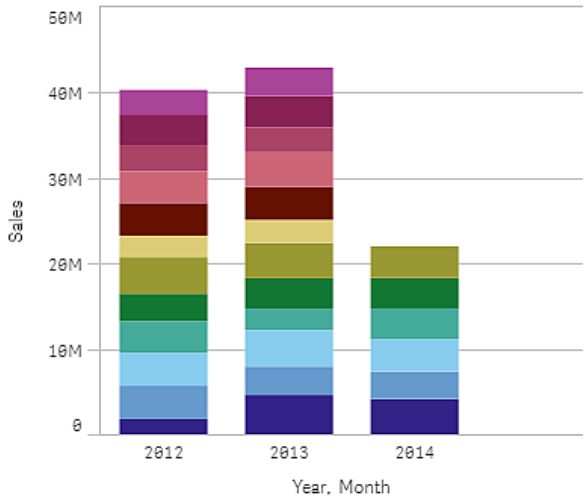
With grouped bars, you can easily compare two or more items in the same categoric al group.

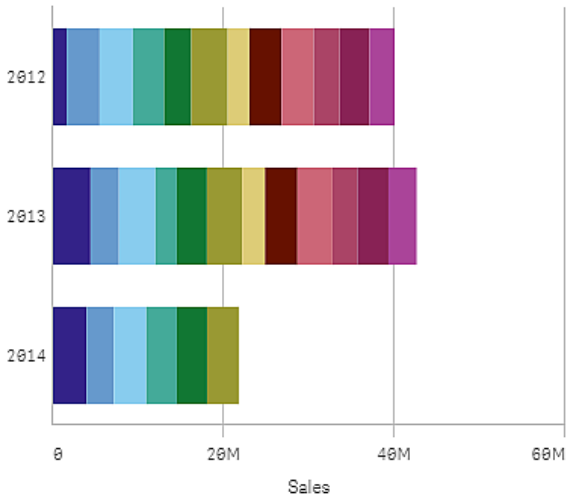


With stacked bars it is easier to compare the total quantity between different months. Stacked bars combine bars of different groups on top of each other and the total height of the resulting bar represents the combined result.



The bar chart can be displayed horizontally or vertically.





When to use it

Grouping and stacking bars makes it easy to visualize grouped data. The bar chart is also useful when you want to compare values side by side, for example sales compared to forecast for different years, and when the measures (in this case sales and forecast) are calculated using the same unit.

Advantages	Disadvantages
The bar chart is easy to read and understand. You get a good overview of values when using bar charts.	The bar chart does not work so well with many dimension values due to the limitation of the axis length. If the dimensions do not fit, you can scroll using the scroll bar, but then you might not get the full picture.

Creating a bar chart

You can create a bar chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty bar chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

In a bar chart you need at least one dimension and one measure.

You can include up to two dimensions and one measure, or one dimension and up to 15 measures in a bar chart. Each bar corresponds to a dimension, and the values of the measures determine the height/length of the bars.

Dimensions	Measures	Result
1 dimension	1 measure	A simple bar chart with one bar for each dimension value.
2 dimensions	1 measure	A grouped or a stacked bar chart with one bar for each value of the two dimensions.
1 dimension	up to 15 measures	A grouped or a stacked bar chart with one bar for each value of each measure..

You can add dimensions and measures to the chart in different ways:

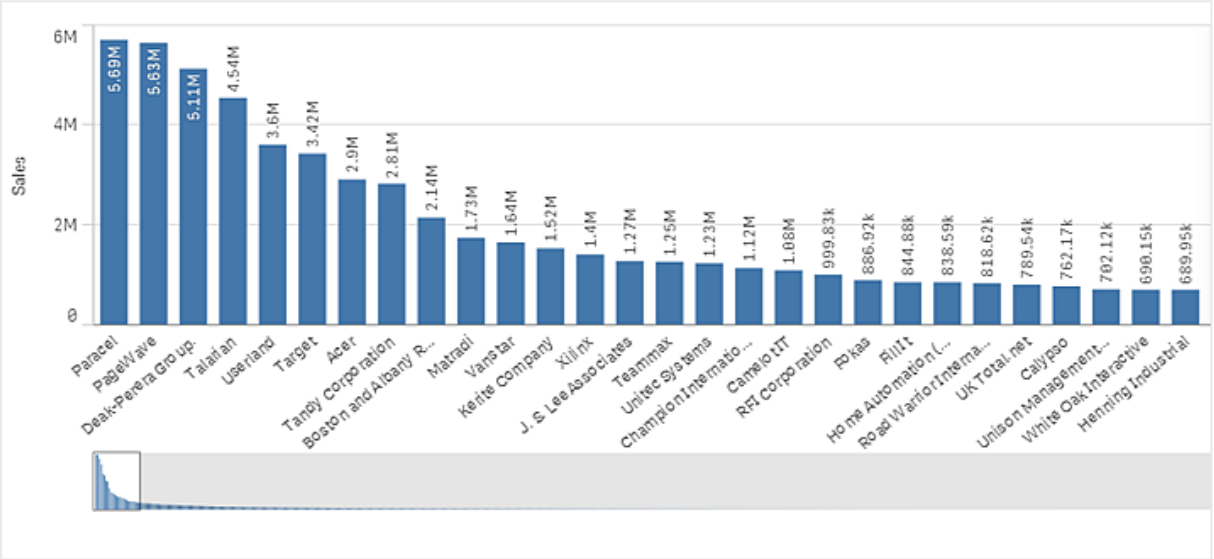
From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 215)*
From master items.	*Creating a visualization using master items (page 214)*
From the properties panel.	*Adding a dimension (page 246)* *Adding a measure (page 247)*

When you have created the bar chart, you may want to adjust its appearance.

Display limitations

Displaying large numbers of dimension values

When the number of dimension values exceeds the width of the visualization, a mini chart with a scroll bar is displayed. You can scroll by using the scroll bar in the mini chart, or, depending on your device, by using the scroll wheel or by swiping with two fingers. When a large number of values are used, the mini chart no longer displays all the values. Instead, a condensed version of the mini chart (with the items in gray) displays an overview of the values, but the very low and the very high values are still visible.



Bar chart with mini chart

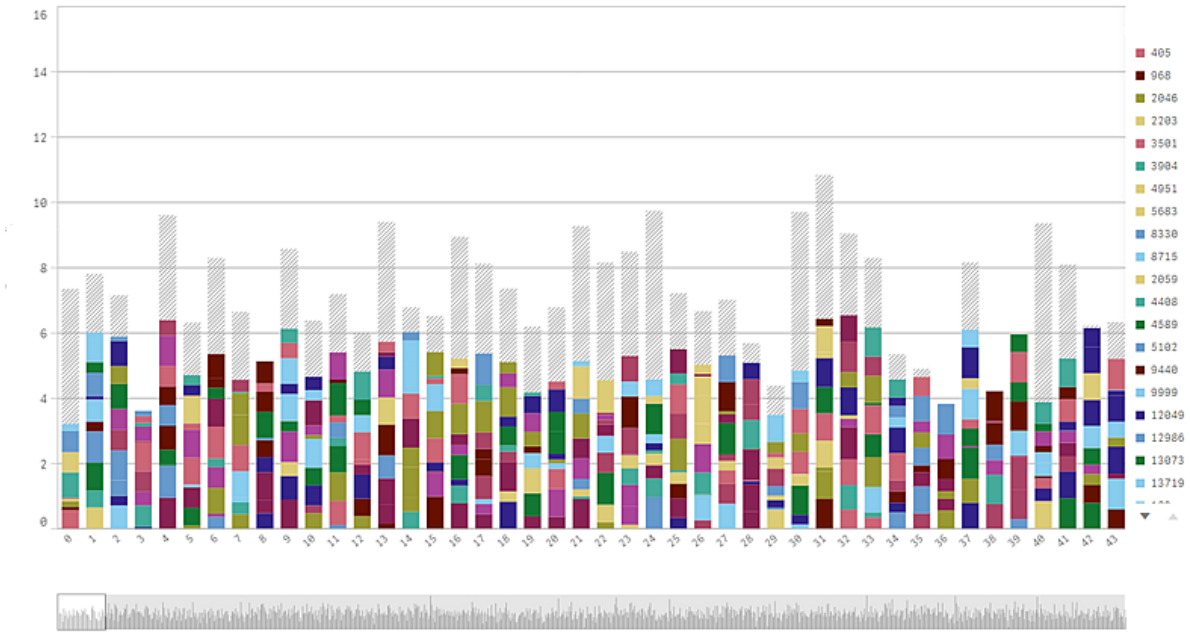
Displaying out of range values

In the properties panel, under **Appearance**, you can set a limit for the measure axis range. Without a limit, the range is automatically set to include the highest positive and lowest negative value, but if you set a limit you may have values that exceed that limit. A bar that exceeds the limit will be cut diagonally to show that it is out of range.

When a reference line is out of range, an arrow is displayed together with the number of reference lines that are out of range.

Displaying large amounts of data in a stacked bar chart

When displaying large amounts of data in a stacked bar chart, there may be cases when not each dimension value within a bar is displayed with correct color and size. These remaining values will instead be displayed as a gray, striped area. The size and total value of the bar will still be correct, but not all dimension values in the bar will be explicit.



To remove the gray areas, you can either make a selection or use dimension limits in the properties panel.

The approximate limit for how many stacked bars that can be displayed without gray areas is 5000 bars, assuming that each bar consists of 10 inner dimension values and one dimension value and one measure value for the whole bar.

The initial data load is 500 dimension values or dimension stacks. (The value 500 refers to the outer dimension values, not each dimension value in a stack.) When you have scrolled past those 500 values, an incremental load is performed, where values are instead loaded based on the current view or scroll position.

Bar chart example

This example shows how to make a bar chart to visualize sales data and how it is distributed for different product groups.

Dataset

In this example, we'll use two data files available in the Qlik Sense Tutorial - Building an App. Download and expand the tutorial, and the files are available in the *Tutorials source* folder.

- *Sales.xls*
- *Item master.xls*

Tutorial - Building an App

Add the two data files to an empty app, and make sure that they are associated by *Item Number*.

The dataset that is loaded contains sales data. The *Item master* table holds the information about the items ordered, such as product groups.

Measure

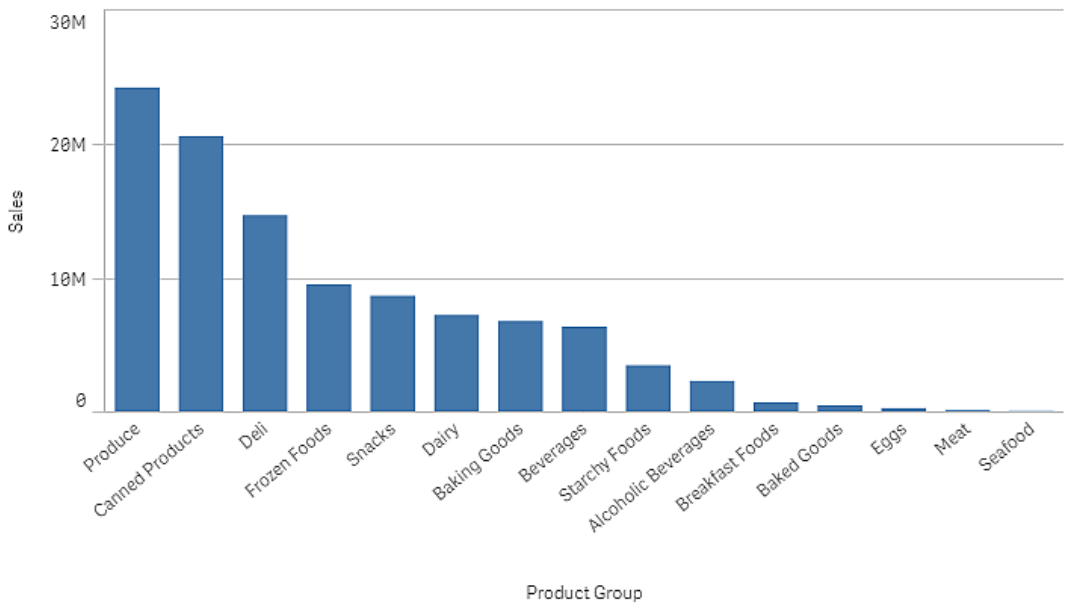
We use the sales volume as the measure, by creating a measure in Master items with the name *Sales*, and the expression `Sum(Sales)`.

Visualization

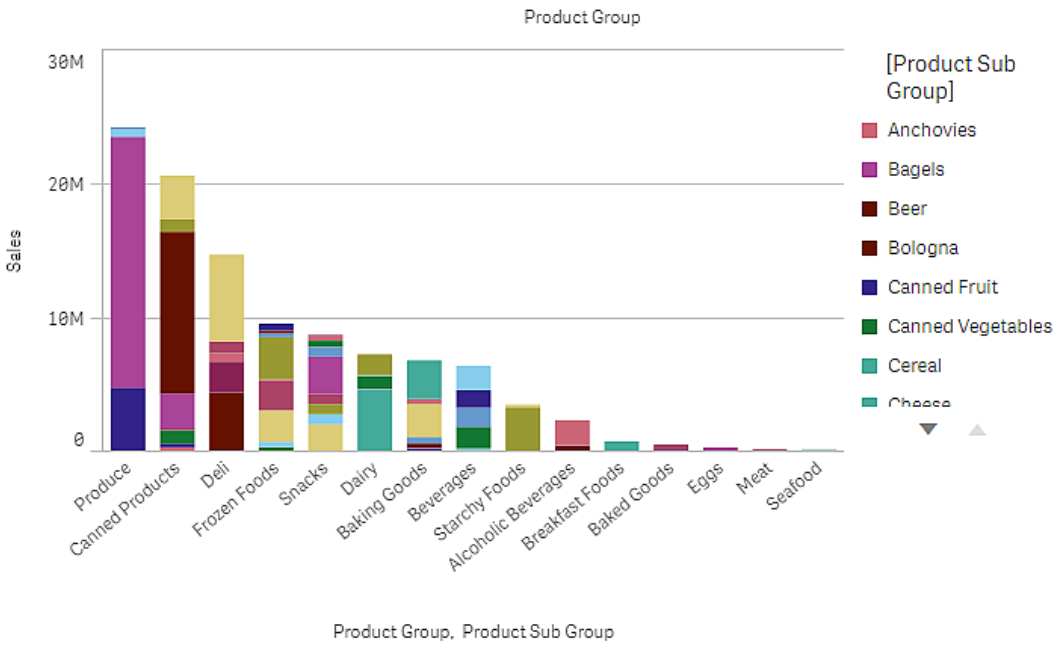
We add a bar chart to the sheet and set the following data properties:

- **Dimension**: Product Group (product group).
- **Measure**: *Sales*; the measure that was created as a master item.

The following bar chart is created, with a bar showing the sales for each product group..



But we want to have some more detailed information about the product sales, by adding the Product Sub Group as a dimension. The Product Sub Group field divides the product groups into sub groups. By default, a grouped chart is selected when adding the second dimension. We want to display a stacked chart instead, that is changed under **Appearances** in the properties panel.



Discovery

The bar chart visualizes the sales volume of different product groups, divided into product sub groups. The visualization is sorted in order of sales volume per product. You can hover the mouse pointer over a product sub group and view the details.

In the bar chart we can see that Produce has the highest sales volume. One of the sub products contribute to most of the Produce sales, if we hover over that part of the bar we can see it is Fresh Vegetables.

Bar chart properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**. This option is not available in box plot dimensions.

Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.
Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions.
Presentation	When you have at least two dimensions or two measures, you can present the dimensions or measures grouped together or stacked on top of each other. Select vertical or horizontal orientation of the visualization. **Grid line spacing**: Select the spacing of the grid lines. The **Auto** setting is **Medium**. **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color

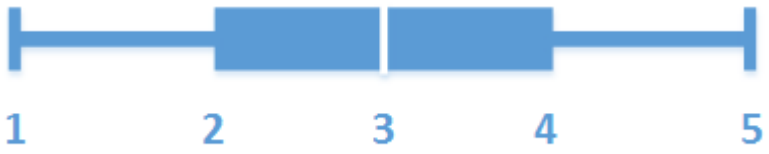
	picker to change the dimension color. **Multicolored** Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Use library colors**: Option available when a master dimension or master measure used in the visualization has a color assigned to it. You can select to use the master item colors or to disable the master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. Only available with **Single color** and **Multicolored** settings. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: • **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. • **Sequential classes**: The transition between the different color groups is made using distinctly different colors. • **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. • **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range

	critical values are emphasized with light colors. **Reverse colors**: When selected, the color scheme is reversed. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis: <Dimension>	**Labels and title**: Select what to display of labels and title. **Label orientation**: Select how to display the labels. **Position**: Select where to display the dimension axis.
Y-axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the measure axis. **Scale**: Set the spacing of the measure axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.

Box plot

The box plot is suitable for comparing range and distribution for groups of numerical data, illustrated by a box with whiskers, and a center line in the middle. The whiskers represent high and low reference values for excluding outlier values. You can define the box start and end points, and whiskers ranges with a few

different presets, or define your own settings using expressions.



1. First whisker
2. Box start
3. Center line
4. Box end
5. Last whisker

You can hover over a box to display a popup showing the respective values of the box plot elements.

When to use it

The box plot is suitable for comparing range and distribution for groups of numerical data.

Advantages	Disadvantages
The box plot organizes large amounts of data, and visualizes outlier values.	The box plot is not relevant for detailed analysis of the data as it deals with a summary of the data distribution.

Creating a box plot

You can create a box plot on the sheet you are editing.

In a box plot you need to use one or two dimensions, and one measure. If you use a single dimension you will receive a single box visualization. If you use two dimensions, you will get one box for each value of the second, or outer, dimension.

You cannot use calculated dimensions in a box plot.

Do the following:

1. From the assets panel, drag an empty box plot to the sheet.
2. Add the first dimension.
   This is the inner dimension, which defines a box.
3. Add a second dimension.
   This is the outer dimension, which defines the boxes shown on the dimension axis.
4. Click **Add measure** and create a measure from a field. The measure does not have to contain an aggregation.

When you have created the box plot, you may want to adjust its appearance and other settings in the properties panel. By default, the **Standard (Tukey)** preset is used

Changing the definition of the box plot

You can use one of the three presets, found under **Box plot elements** in the properties panel, to define your box plot.

- **Standard (Tukey)**
  This preset is based on the original box plot definition by J. Tukey. The center line represents the median (second quartile), and the box start and end points represent the first and third quartiles. Whisker length can be set to 1, 1.5 or 2 inter-quartile ranges. An inter-quartile range represents the distance between two adjacent quartiles, for example, the first and the second quartiles.
- **Percentile-based**
  This preset is also defined with the box start and end points representing the first and third quartiles, and the center line representing the median, but the whisker length is adjusted by setting a percentile based whisker position.
- **Standard deviation**
  This preset is based on standard deviations, with the center line representing the average value, and the box start and end points representing one standard deviation variance. You can set the whisker length to a multiple of standard deviations.

You can also define a custom box plot where you set the value of each box plot element using an expression.

Box plot example

This example shows how to make a box plot to visualize weather data from Qlik DataMarket.

Dataset

In this example, we'll use weather data loaded from the Weather for more than 2500 cities worldwide data source in Qlik DataMarket. The dataset is based on the following selections in Qlik DataMarket:

- Location: Sweden > Gällivare Airport, Kiruna Airport, Kramfors Sollefteå Airport, Luleå Airport, Ostersund Froson, Skellefteå Airport, Umeå Airport, Örnsköldsvik Airport
- Date: All time
- Measurement: Average of the 24 hourly temperature observations in degrees Celsius

The dataset that is loaded contains a daily average temperature measurement from a number of weather stations in the north of Sweden during the time period of 2010 to 2017.

Measure

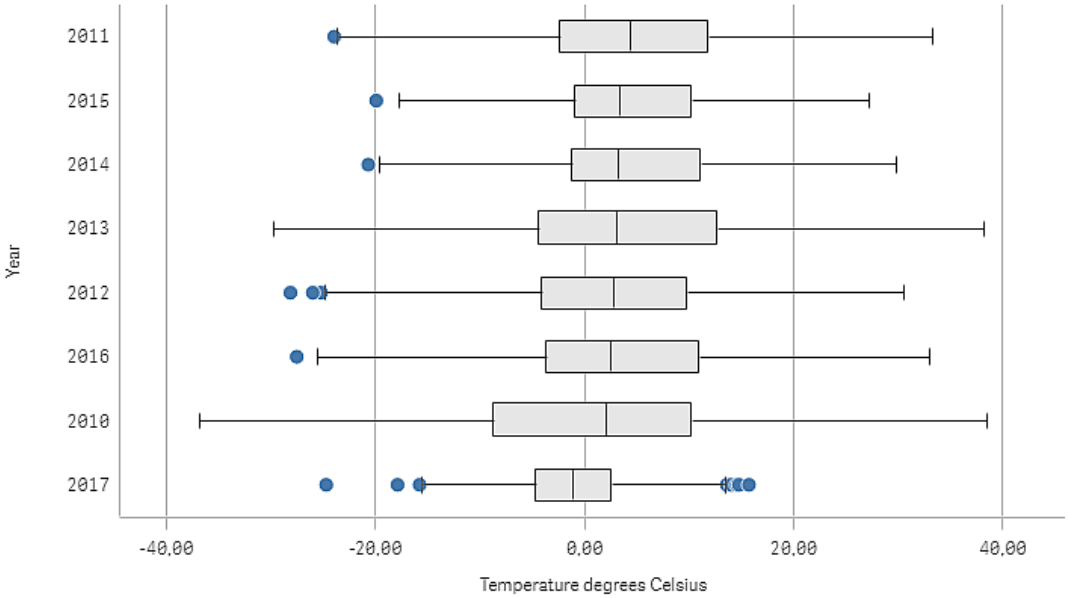
We use the average temperature measurement in the dataset as the measure, by creating a .measure in Master items with the name *Temperature degrees Celsius*, and the expression `Avg([Average of the 24 hourly temperature observations in degrees Celsius])`.

Visualization

We add a box plot to the sheet and set the following data properties:

- **Dimension**: Date (date) and Year (year). The order is important; Date needs to be the first dimension.
- **Measure**: *Temperature degrees Celsius*; the measure that was created as a master item.

In this example we use the default box plot preset, **Standard (Tukey)** with the whisker length **1.5 interquartile range**.



Discovery

The box plot visualizes the distribution of the daily temperature measurements. The visualization is sorted in mean temperature order. The mean temperature for each year is illustrated by the middle line in each box. The box stretches from the first quartile to the third quartile, and the whiskers stretch 1.5 inter-quartile ranges. There are also a number of outlier values, the points that are placed outside the whiskers. You can hover the mouse pointer over an outlier point and view the details.

In the box plot we can see that the year 2010 has the longest box and whiskers. That shows that the year 2010 has the largest distribution of temperatures measured. It also seems to be the coldest year in average.

The range of 2017 is small, as the dataset only contains measurements from the first months of the year.

Box plot properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

It is not possible to put limitations on the inner dimension of a box plot.

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**. This option is not available in box plot dimensions.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.
Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You cannot use calculated dimensions in a box plot.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars ( ) to rearrange the order.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Box plot elements

Use presets	If you set this to **On** you can select one of the available presets that define the elements of the box plot: • **Standard (Tukey)** • **Percentile-based** • **Standard deviation** If you set to **Off** you need to define all elements using custom expressions.

Standard (Tukey) preset settings	This preset is based on the original box plot definition by J. Tukey. The center line represents the median (second quartile), and the box start and end points represent the first and third quartiles. You can set the length of the whiskers with **Whisker length**: • **1 inter-quartile range** • **1.5 inter-quartile range** • **2 inter-quartile ranges** **1 inter-quartile range** represents the length of the box, that is, the difference between the first and third quartiles.
Percentile-based preset settings	This preset is also defined with the box start and end points representing the first and third quartiles, and the center line representing the median, but the whisker length is adjusted by setting a percentile based **Whisker position**: • **Min/max** This setting sets the whisker start and end points to the minimum and maximum values. • **1st/99th percentile** • **5th/95th percentile** • **10th/90th percentile**
Standard deviation preset settings	This preset is based on standard deviations, with the center line representing the average value, and the box start and end points representing one standard deviation variance. You can set the whisker length to a multiple of standard deviations: • **One standard deviation** • **Two standard deviations** • **Three standard deviations**
Include outliers	You can select to display outlier values, that is, values on either side of the whiskers.

Custom boxplot element settings	If you set **Use presets** to **Off** you can define all elements using a custom expression and label. Expressions are prefilled with the expressions used to define the elements in the most recently used preset. **Center line** • **Name** • **Expression** **Box edges** • **Box start label** • **Box start expression** • **Box end label** • **Box end expression** **Whiskers** • **First whisker label** • **First whisker expression** • **Last whisker label** • **Last whisker expression**

Sorting

You can sort the box plot by any of the box plot elements or a custom expression, or by the second dimension of the chart in numerical or alphabetical order.

Sorting options	Comment
Sort by expression	Select which element to sort by (**First whisker**, **Box start**, **Center line**, **Box end** or **Last whisker**). You can also customize the sort expression. Do the following: 1. Click 🔗 to unlink the sort expression. 2. Edit the sort expression.
Sort numerically	Enable this to sort numerically by the second dimension of the chart. If you change the second dimension, the chart will be sorted by the new dimension.
Sort alphabetically	Enable this to sort alphabetically by the second dimension of the chart. If you change the second dimension, the chart will be sorted by the new dimension.

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

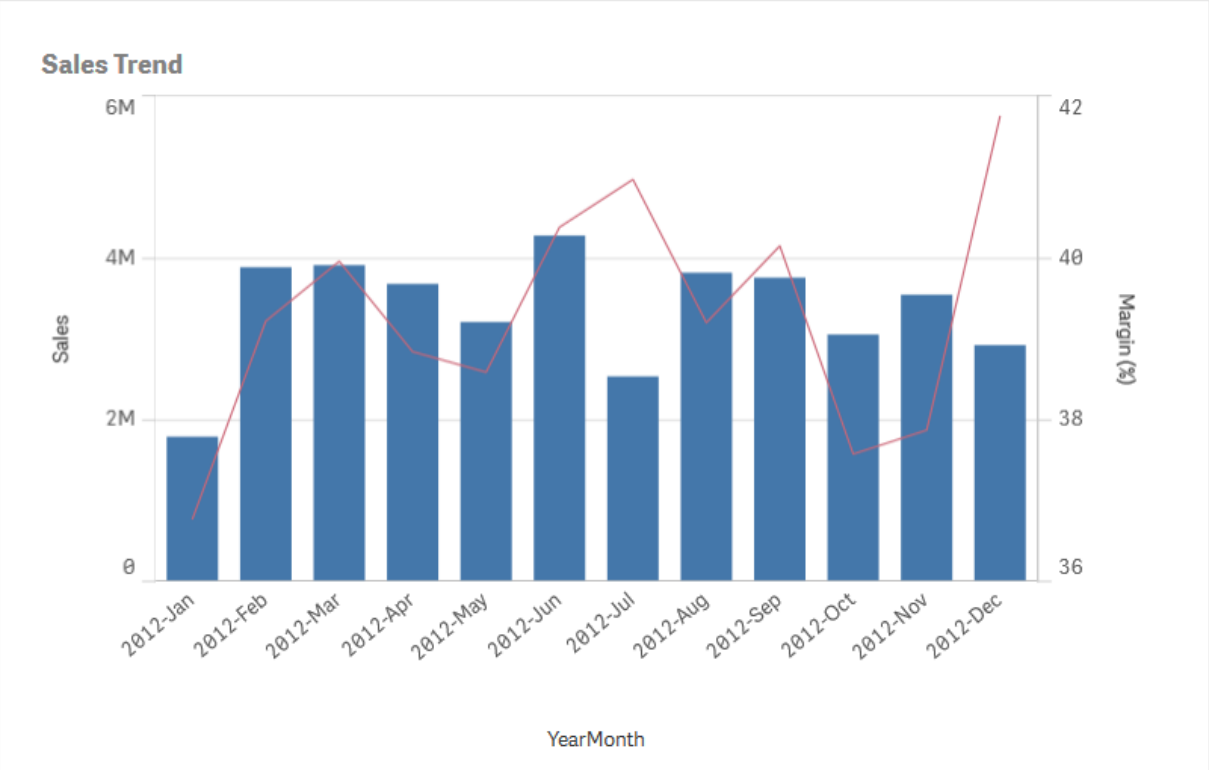
Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions.
Presentation	You can set the orientation to be **Vertical** or **Horizontal**. **Show whisker ticks**: Enable this to display vertical lines at the end of each whisker. **Gridline spacing**: Set this to **Custom** if you want to customize the horizontal gridlines. You can choose between: • **No lines** • **Medium** • **Narrow**
Colors	You can set the presentation colors of the box plot: • **Box color** • **Outlier color**
X-axis: <Measure>	**Position**: Select where to display the measure axis. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
Y-axis: <Dimension>	**Position**: Select where to display the dimension axis.

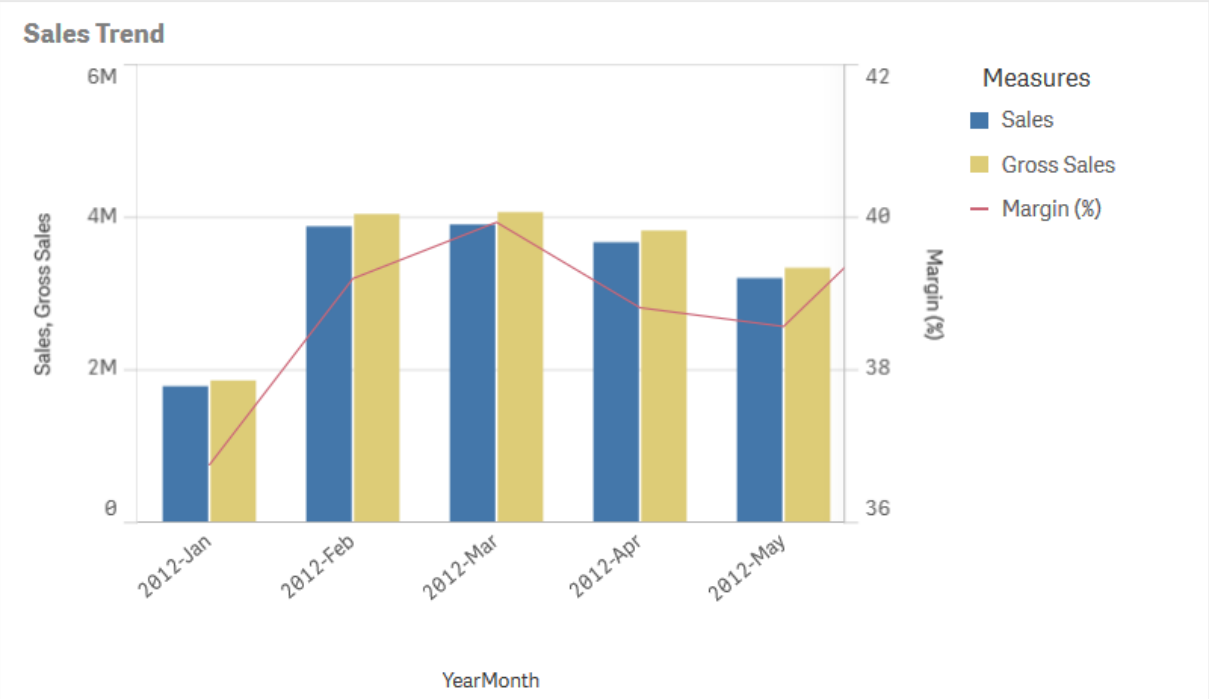
Combo chart

The combo chart is suitable for comparing two sets of measure values that are usually hard to compare because of the differences in scale. A typical example is when you have a bar chart with sales figures and want to combine these figures with the margin values (in percent). In a regular bar chart, the bars for sales would be displayed as usual, but the margin values would be almost invisible because of the very large difference between the numeric values for sales and margin.



With a combo chart you can combine these values by, for example, using bars for the sales values and a line for the margin values. By default, the bars have the measure axis on the left and the margin values have a separate axis to the right. The two measures use the same dimension (YearMonth).

If you have yet another measure, for example, gross sales, with values that are roughly in the same range as the sales values, you can add the third measure as bars and either stack or group the new measure values with the sales values. With grouped bars, you can easily compare two or more items in the same categorical group. Stacked bars combine bars of different groups on top of each other and the total height of the resulting bar represents the combined result.



Combo chart with three measures

The combo chart can only be displayed vertically.

When to use it

With the possibility to have different measure scales, one to the left and one to the right, the combo chart is ideal when you want to present measure values that are normally hard to combine because of the significant difference in value ranges.

But a combo chart can also be quite useful when comparing values of the same value range. In the image above, the combo chart only has one measure axis, but the relationship between the two categories sales and cost is clear.

Advantages	Disadvantages
The combo chart is the best choice when combining several measures of different value ranges.	The combo chart only supports one dimension, and can therefore not be used when you need to include two or more dimensions in the visualization.

Creating a combo chart

You can create a combo chart on the sheet you are editing. In a combo chart, you need at least one dimension and one measure.

Do the following:

1. From the assets panel, drag an empty combo chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.

3. Click **Add measure** and select a measure or create a measure from a field. Select to show the measure as a bar.
4. Add another measure, selecting to show the measure as a line or a marker.

You can only have one dimension, but you can continue adding up to 15 measures. You can only have two measure axes though. This means, if you add three or more measures with a large difference in value range it can be hard to display all measures with a good distribution of values.

When you have created the combo chart, you may want to adjust its appearance and other settings in the properties panel.

Display limitations

Displaying out of range values

In the properties panel, under **Appearance**, you can set a limit for the measure axis range. Without a limit, the range is automatically set to include the highest positive and lowest negative value, but if you set a limit you may have values that exceed that limit. A bar that exceeds the limit will be cut diagonally to show that it is out of range. For a line data point value that is out of range, an arrow indicates the direction of the value.

Combo chart properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use at least one line or when you have two measures.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .

Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**. This option is not available in box plot dimensions.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.

Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Bars/Line/Marker	You can choose to add a measure as bars, as a line, or as markers. For lines and markers, you can use the **Primary axis** to the left or the **Secondary axis** to the right. For markers you can choose between several different shapes.
Fill marker	Select to display markers filled.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment

Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value ‘0’ are not included in the presentation. If there is more than one measure value, all the measure values must have the value ‘0’ to be excluded from the presentation.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	When you have at least two measures as bars, you can present the bars grouped together or stacked on top of each other. **Bar labels**: By default, **Off**. With the **Auto** setting, value labels are displayed for each bar when there is enough space. When you have a least one line, the following options are available: **Missing values** Set how to show missing values. **Show as gaps** The line has a gap, which represents the missing value. **Show as connections** The line connects the values that exist on either side of the missing value. If the missing value is first or last, no line is drawn. **Show as zeros** The line is drawn to zero and from there to the next existing value. If the missing value is first or last, no line is drawn. **Show data points**: Select to display the data points on the line. *The option Show labels on data points is not available for combo charts.*
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Multicolored** Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when

there are more than 12 dimension values.

Use library colors: Option available when a master dimension or master measure used in the visualization has a color assigned to it. You can select to use the master item colors or to disable the master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. Only available with **Single color** and **Multicolored** settings.

By dimension

By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

Persistent colors: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**.

Color scheme: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors.

By measure

By default, **Sequential gradient** is selected. The higher the measure value, the darker the color.

Color scheme: You have the following four options:

- **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues.
- **Sequential classes**: The transition between the different color groups is made using distinctly different colors.
- **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light.
- **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

Reverse colors: When selected, the color scheme is reversed.

By expression

You can use coloring by expression to accentuate certain values. Supported

formats: RGB, ARGB, and HSL.

Expression: Enter the expression that you want to use. Click *fx* to open the expression editor.

The expression is a color code: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients.

When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range.

Show legend: Not available when **Single color** is selected. By default set to **Auto**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting.

Legend position: Select where to display the legend.

Show legend title: When selected, the legend title is displayed.

By measure

By default, **Sequential gradient** is selected. The higher the measure value, the darker the color.

Color scheme: You have the following four options:

Sequential gradient: The transition between the different color groups is made using different shades of colors. High measure values have darker hues.

Sequential classes: The transition between the different color groups is made using distinctly different colors.

Diverging gradient: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light.

Diverging classes: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

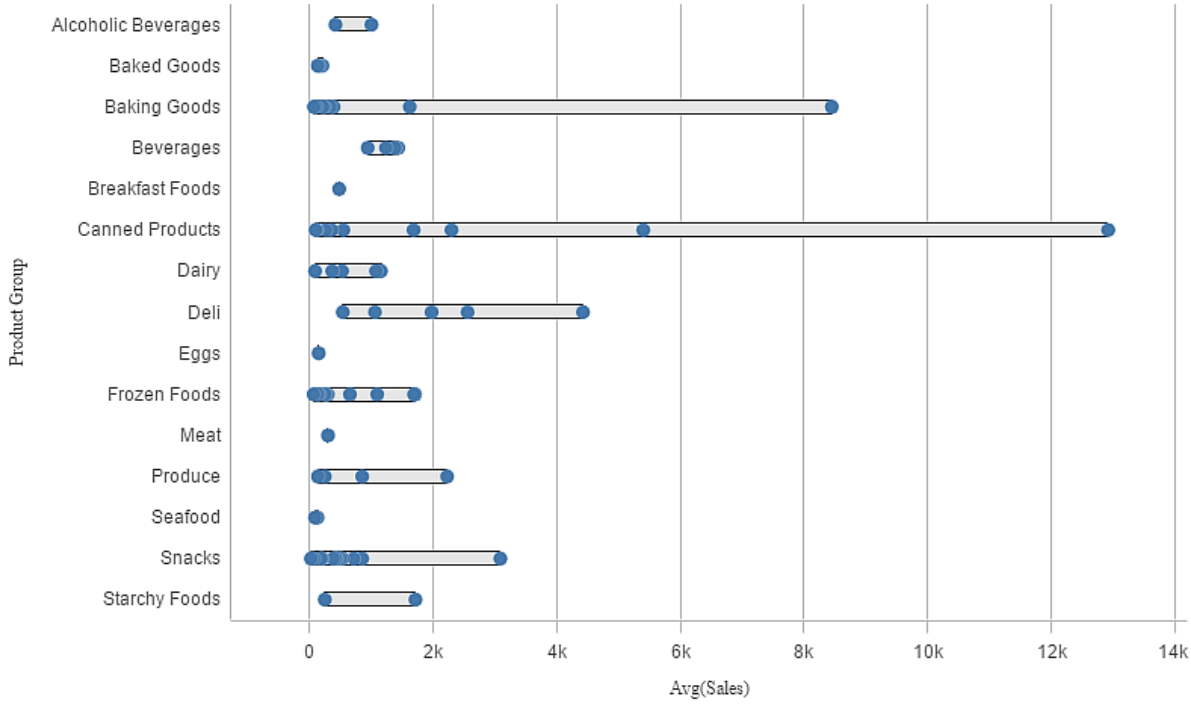
Reverse colors: When selected, the color scheme is reversed.

Show legend: Not available when **Single color** is selected. By default set to **Auto**. The legend is displayed if there is enough space. The placement can be

	changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis: <Dimension>	**Labels and title**: Select what to display of labels and title. **Label orientation**: Select how to display the labels. **Position**: Select where to display the dimension axis.
Y-axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the measure axis. **Scale**: Set the spacing of the measure axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.

Distribution plot

The distribution plot is suitable for comparing range and distribution for groups of numerical data. Data is plotted as value points along an axis. You can choose to display only the value points to see the distribution of values, a bounding box to see the range of values, or a combination of both as shown here.



When to use it

The distribution plot is suitable for comparing range and distribution for groups of numerical data.

Advantages	Disadvantages
The distribution plot visualizes the distribution of data.	The distribution plot is not relevant for detailed analysis of the data as it deals with a summary of the data distribution.

Creating a distribution plot

You can create a distribution plot on the sheet you are editing.

In a distribution plot you need to use one or two dimensions, and one measure. If you use a single dimension you will receive a single line visualization. If you use two dimensions, you will get one line for each value of the second, or outer, dimension.

Do the following:

1. From the assets panel, drag an empty distribution plot to the sheet.
2. Add the first dimension.
   This is the inner dimension, which defines the value points.
3. Add a second dimension.
   This is the outer dimension, which defines the groups of value points shown on the dimension axis.
4. Click **Add measure** and create a measure from a field.

When you have created the distribution plot, you may want to adjust its appearance and other settings in the properties panel.

Distribution plot example

This example shows how to make a distribution plot to visualize weather data from Qlik DataMarket.

Dataset

In this example, we'll use weather data loaded from the Weather for more than 2500 cities worldwide data source in Qlik DataMarket. The dataset is based on the following selections in Qlik DataMarket:

- Location: Sweden > Gällivare Airport
- Date: All time
- Measurement: Average of the 24 hourly temperature observations in degrees Celsius

The dataset that is loaded contains a daily average temperature measurement from a weather station in the north of Sweden during the time period of 2010 to 2017.

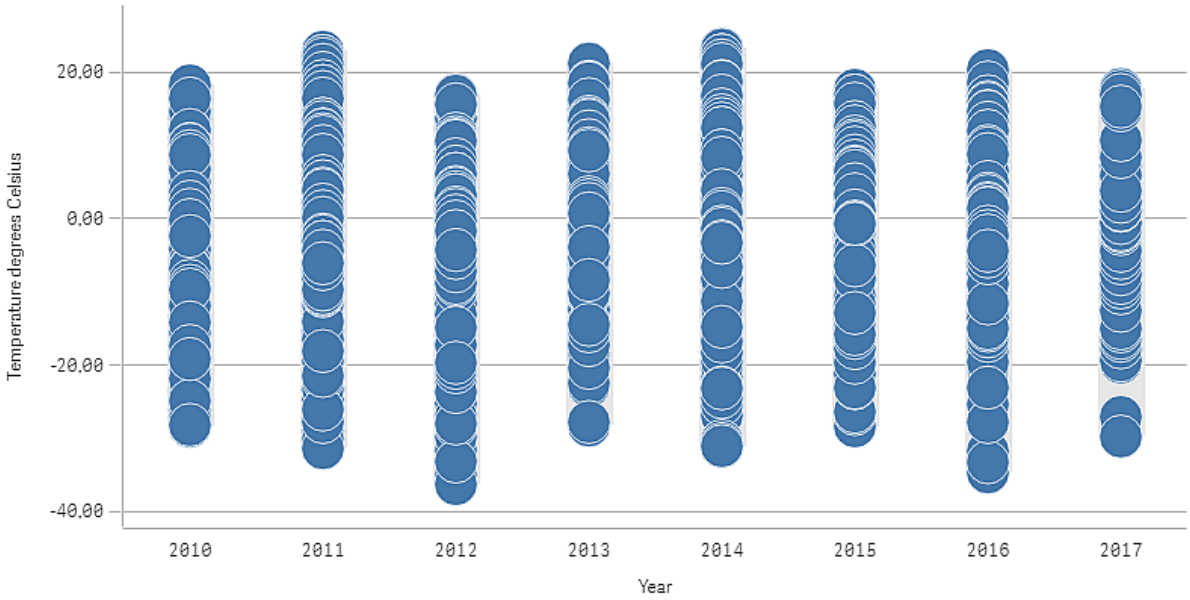
Measure

We use the average temperature measurement in the dataset as the measure, by creating a .measure in Master items with the name *Temperature degrees Celsius*, and the expression `Avg([Average of the 24 hourly temperature observations in degrees Celsius])`.

Visualization

We add a distribution plot to the sheet and set the following data properties:

- **Dimension**: Date (date) and Year (year). The order is important, Date needs to be the first dimension.
- **Measure**: *Temperature degrees Celsius*, the measure that was created as a master item.



Discovery

The distribution plot visualizes the distribution of the daily temperature measurements. The visualization is sorted by year, and each point represents a temperature measurement.

In the visualization we can see that the year 2012 has the lowest extreme temperature measurement, close -40 degrees Celsius. We can also see that the year 2016 seems to have the largest distribution of temperature measurements. With this many points in the distribution plot, it can be hard to spot clusters and outliers, but the year 2017 has two low temperature measurements that stand out. You can hover the mouse pointer over a point and view the details.

Distribution plot properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

It is not possible to put limitations on the inner dimension of a distribution plot.

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**. This option is not available in box plot dimensions.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.
Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Sorting

You can sort the box plot by any of the distribution plot elements or a custom expression, or by the second dimension of the chart in numerical or alphabetical order.

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

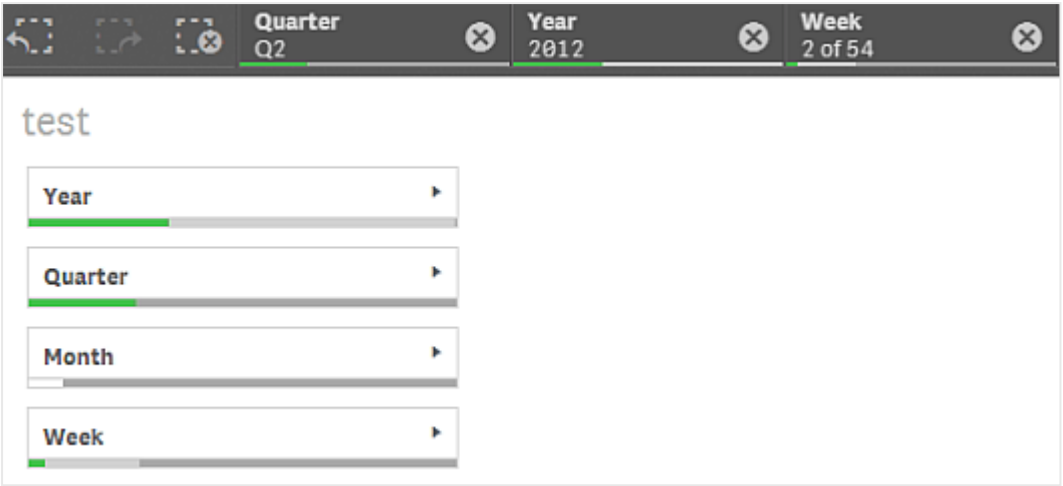
General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions.

Presentation	You can set the orientation to be **Vertical** or **Horizontal**. You can present the distribution plot in three ways: • **Points and background** - this option displays a bounding box showing the range of the values, and value points. • **Points only** - this option displays value points only. • **Background only** - this option displays a bounding box showing the range of the values only. **Gridline spacing**: Set this to **Custom** if you want to customize the horizontal gridlines. You can choose between: • **No lines** • **Medium** • **Narrow** **Bubble size**: You can adjust the size of the bubbles that illustrate the value points. **Jitter points**: You can use this option to jitter several overlapping value points. This moves some of the points slightly to create a larger footprint that shows that there are more than one value behind the point.
Colors	You can set the presentation colors of the distribution plot. You only need to select **Custom** if you want to change the settings.
X-axis: <Measure>	**Position**: Select where to display the measure axis. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
Y-axis: <Dimension>	**Position**: Select where to display the dimension axis.

Filter pane

You can add a filter pane to control what data that is shown in the visualizations on a sheet. A filter pane can filter the data of several dimensions at once. For example, if you have a chart of sales over time, you can use a filter pane to limit the data in the chart to only show sales from a selected time period, from certain product categories, and from a certain region.

When a dimension is added, it is placed to the right of the previous dimensions, or below, depending on the available space. As long as there is space enough, the dimensions are displayed as expanded lists. If there is not enough space, the dimensions that were added first are turned into filter panes.



Selections have been made in the dimensions Year, Quarter, and Week

When to use it

With filter panes, you can easily make several selections to define your data set exactly like you want it. With your well-defined data set, you can explore data of particular interest.

By using the selection menu options in the filter panes (select possible, select alternative, and select excluded), you can make adjustments to the data set and compare the results with the previous selection.

Advantages	Disadvantages
Filter panes are good for making selections and defining data sets. But they also show the relationship between different values, the associations. The green, white, and gray colors reflect the data associations that exist - and that do not exist. And by analyzing those associations, you can make new discoveries, for example, that a sales representative has too many customers, or that a region lacks a sales representative.	When the dimensions contain a very large amount of values, it may be hard to manage the data.

Creating a filter pane

You can create a filter pane on the sheet you are editing.

In a filter pane you can use up to 1000 dimensions.

Do the following:

1. From the assets panel, drag an empty filter pane to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. If you want to add more dimensions, click **Add dimension** again.

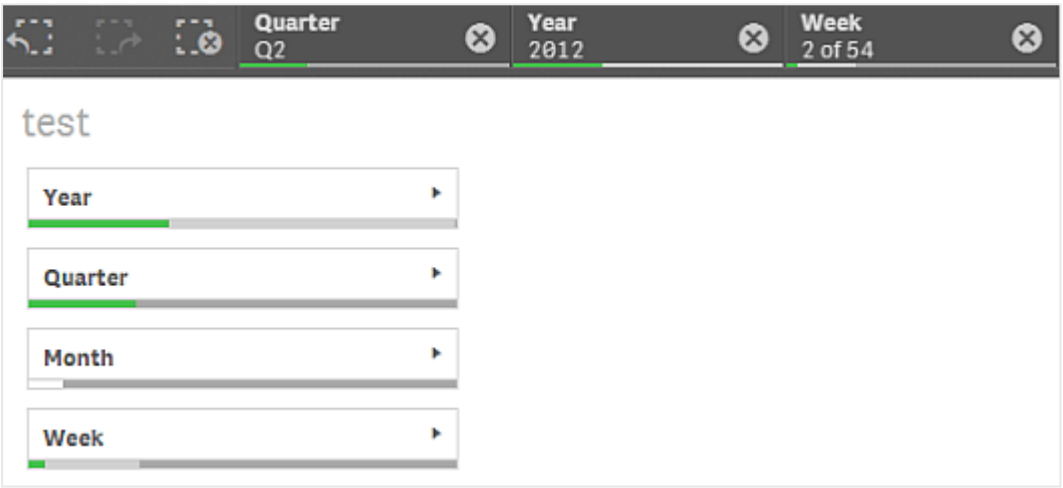
When you have created the filter pane, you may want to adjust its appearance and other settings in the properties panel.

If you double-click or drag a field or a dimension from the assets panel, a filter pane is added to the sheet using the dimension. If you then double-click more dimensions, they are automatically added to the new filter pane.

Selections in filter panes

During analysis you click a compressed filter pane dimension to open a selection list.

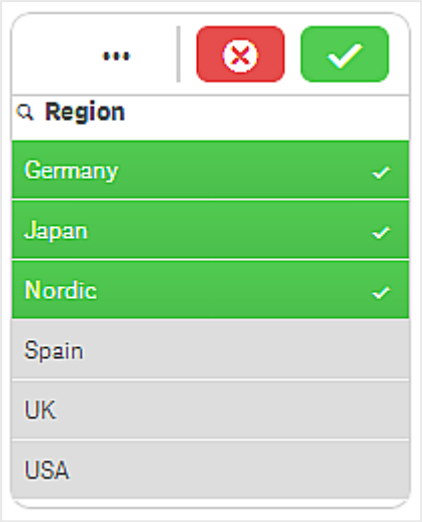
When you make a selection, it is reflected in the small bars at the bottom of each filter pane dimension. Four states can be displayed in the bars: selected (green), possible (white), alternative (light gray), and excluded (dark gray). Locked values are indicated by a lock icon. The details of the selections are displayed in the selections bar, above the sheet. You can click an item to see the details and change your selection.



Fields are filtered out from each dimension to be shown in the visualizations on the sheet.

Making selections in filter pane lists

When there is space enough in a filter pane, the dimension values are displayed in a list. In lists, you can click to select a single value or draw to select several values. On a touch device, you can two-finger-tap in the list to select a range of values.



Filter pane with expanded list

The selections tool

The selections tool offers an option to get an overview of the fields and dimensions in an app. In the selections tool you can make selections in all the fields and dimensions in the app, regardless of whether they are used in the app or not.

During analysis, the selections tool is available to the right in the selections bar. Click to open the selections tool.

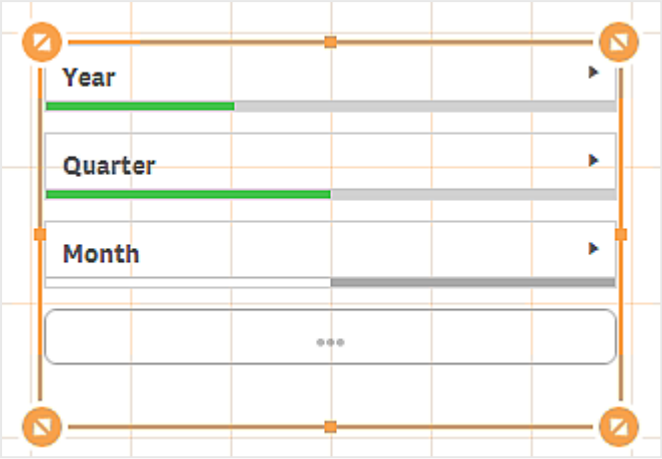
Display limitations

Responsive design

The filter pane has a responsive design and renders as many dimensions as possible. When space is limited, this could involve reducing the size of each dimension so that all dimensions are displayed.

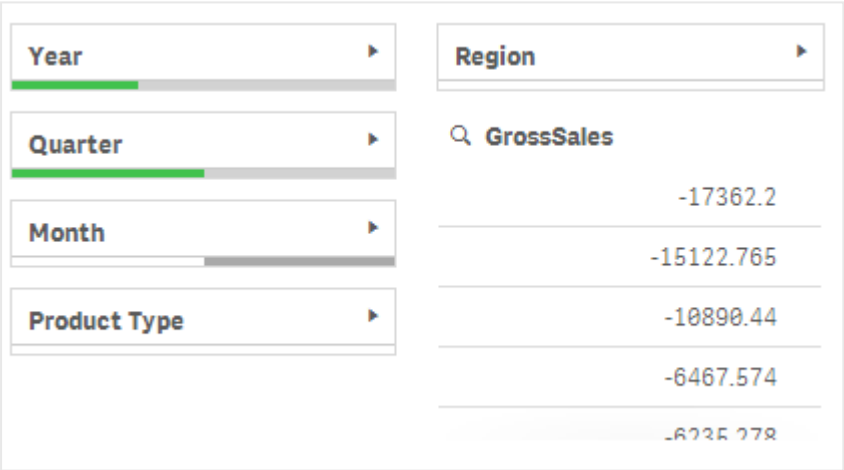
Example:

The following image shows a filter pane while it is being edited. Only three out of five dimensions are displayed. The other dimensions are replaced by a button with an ellipsis (...), indicating that there are more dimensions that are not displayed. You can click the button to open the filter pane in full screen view.



Five dimensions as displayed when editing the filter pane

When you have finished editing the filter pane and enter analysis mode, you will see the filter pane with all the dimensions displayed. If all items cannot be shown due to lack of space, the ellipsis box is displayed to indicate that there are more dimensions.



Five dimensions as displayed when analyzing data

Full screen view

In full screen view, the filter pane is maximized and displays as many dimensions as possible expanded. When not all dimensions can be displayed expanded, the priority order is that the most recently added dimensions are expanded to the right. You can change the priority order in the properties panel, under **Dimensions**. Drag the dimensions to change the order.

Filter pane properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Data

Click **Add** to add a dimension or create a dimension from a field. If the option is dimmed it is not available.

Dimensions

Add dimension	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. If you change the field, the dimension name is automatically updated. Click *fx* to open the expression editor.
Title	Enter a title for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars ( ) to rearrange the order.

Sorting

By default, the dimensions are sorted in the order they were added, with the most recently added dimension last. For filter panes, you change the sorting order of the dimensions under **Dimensions** in the **Data** section. Drag the dimensions to change the order. Under **Sorting** you can change the internal sorting of the dimensions.

Each dimension is sorted internally in the most common way for that type of data. Numbers are sorted numerically, ascending. Text is sorted alphabetically, ascending. If you want to change the internal sorting of a dimension, click the sorting button. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

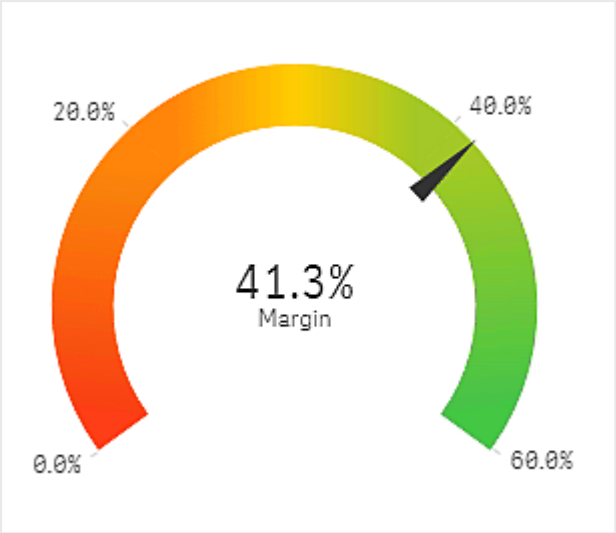
Sorting options	Comment
1. Sort by expression	Enter an expression to sort by. Only available for dimensions.
2. Sort by frequency	Only available for filter panes.
3. Sort numerically	
4. Sort alphabetically	

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Gauge

The gauge is designed to show a single measure value and visualize how to interpret that value.



When to use it

The gauge is often used to present KPIs, for example, on an executive dashboard, and together with segmenting and color coding, it is an effective way of illustrating a performance result.

It is important to set relevant max and min values to support the interpretation of the value. You can use a reference line to provide additional context.

Advantages	Disadvantages
A gauge is easy to read and understand and gives an instant indication of the performance within an area.	The gauge is quite space-demanding in relation to the single value it visualizes. Although visually compelling, the gauge is not always the best choice for presenting a single measure value. Problems when deciding the max and min values can indicate that some other visualization should be used. If you only want to show a performance value, without a gauge, consider using a KPI instead.

Creating a gauge

You can create a gauge on the sheet you are editing. In a gauge you can only have one measure and no dimensions.

Do the following:

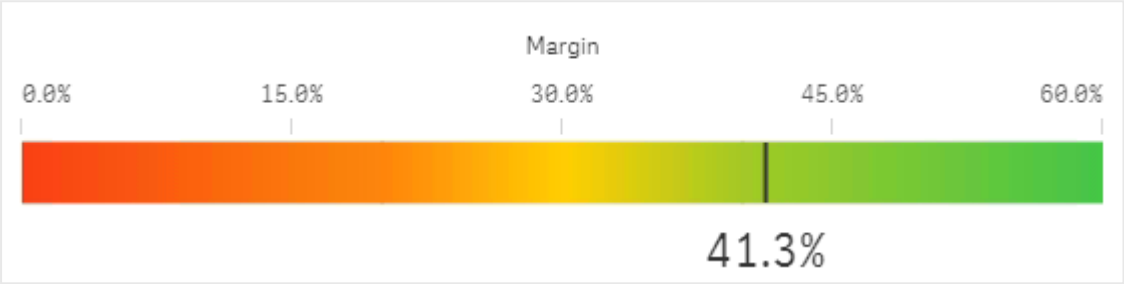
1. From the assets panel, drag an empty gauge to the sheet.
2. Click **Add measure** and select a measure or create a measure from a field.

When you have created the gauge, you may want to adjust its appearance and other settings in the properties panel.

The following settings are used by default in a gauge:

- A radial gauge.
- A single (blue) color.
- Range limits: min (0), max (100).
- No segments.
- Label and title are displayed in medium scale.

For example, you can change the radial gauge to a bar, and use a color gradient.



Display limitations

When a measure value is outside the range limits, an arrow indicates whether the measure value is higher or lower than the range values.

Gauge properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number** and **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Add measure	On the **Data** tab, under **Measures**, click **Add measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add measure** is dimmed, you cannot add more measures.

Add-ons

Reference lines	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

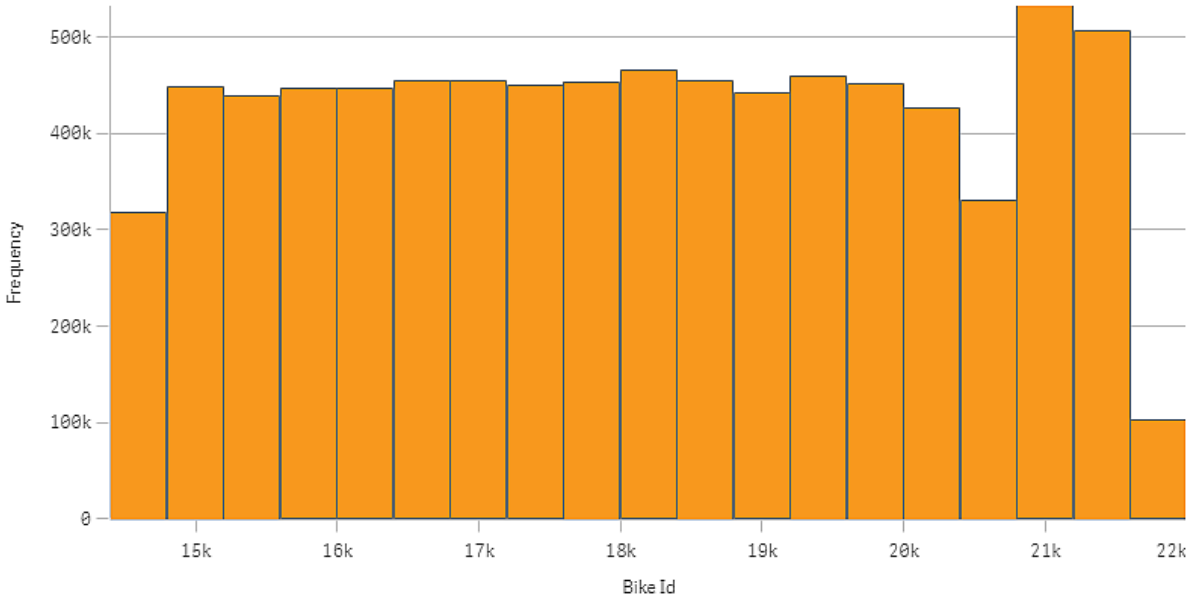
Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	**Range limits** **Min**: Set the minimum value for the gauge. Click *fx* if you want to create an expression. **Max**: Set the maximum value for the gauge. Click *fx* if you want to create an expression. **Radial**/**Bar**.Select to display the gauge as a radial or as a bar. Select vertical or horizontal orientation of the visualization. Only available for bar gauges. **Use segments**: When not selected, a single color (by default blue) is used to illustrate the value. When selected, you can divide the gauge into segments with different colors. When segments are used, a pointer marks the value. Click **Add limit** to add a segment to the gauge. Use the slider or type an expression to set the limit. Click *fx* to create an expression. You can add several segments. Click the segment to change colors. **Remove limit**: Click to remove the selected limit. **Gradient**: Select to use different shades of colors in the transition between the segments. **Use library**: Option when a master measure used in the visualization has a color assigned to it. You can select to use the master measure colors or to disable the master measure color. This option is not available if **Use segments** is enabled.
Measure axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Scale**: Set the spacing of the measure axis scale.

Histogram

The histogram is suitable for visualizing distribution of numerical data over a continuous interval, or a certain time period. The data is divided into bins, and each bar in a histogram represents the tabulated frequency at each bin.



When to use it

The histogram is suitable for visualizing distribution of numerical data over a continuous interval, or a certain time period.

Advantages	Disadvantages
The histogram organizes large amounts of data, and produces a visualization quickly, using a single dimension.	The histogram is not relevant for detailed analysis of the data as it deals with a summary of the data distribution.

Creating a histogram

You can create a histogram on the sheet you are editing. You can only apply a single dimension to a histogram. The dimension must be a numerical field. Histograms do not need a measure, as the frequency of the binned data is automatically calculated.

Do the following:

1. From the assets panel, drag an empty histogram to the sheet.
2. Add the dimension to calculate the frequency on.

> *You cannot use a master dimension that was created using the expression editor, even if the resulting field is numeric.*

When you have created the histogram, you may want to adjust its appearance and other settings in the properties panel.

Histogram example

This example shows how to make a histogram to visualize weather data from Qlik DataMarket.

Dataset

In this example, we'll use weather data loaded from the Weather for more than 2500 cities worldwide data source in Qlik DataMarket. The dataset is based on the following selections in Qlik DataMarket:

- Location: Sweden > Gällivare Airport
- Date: All time
- Measurement: Average of the 24 hourly temperature observations in degrees Celsius

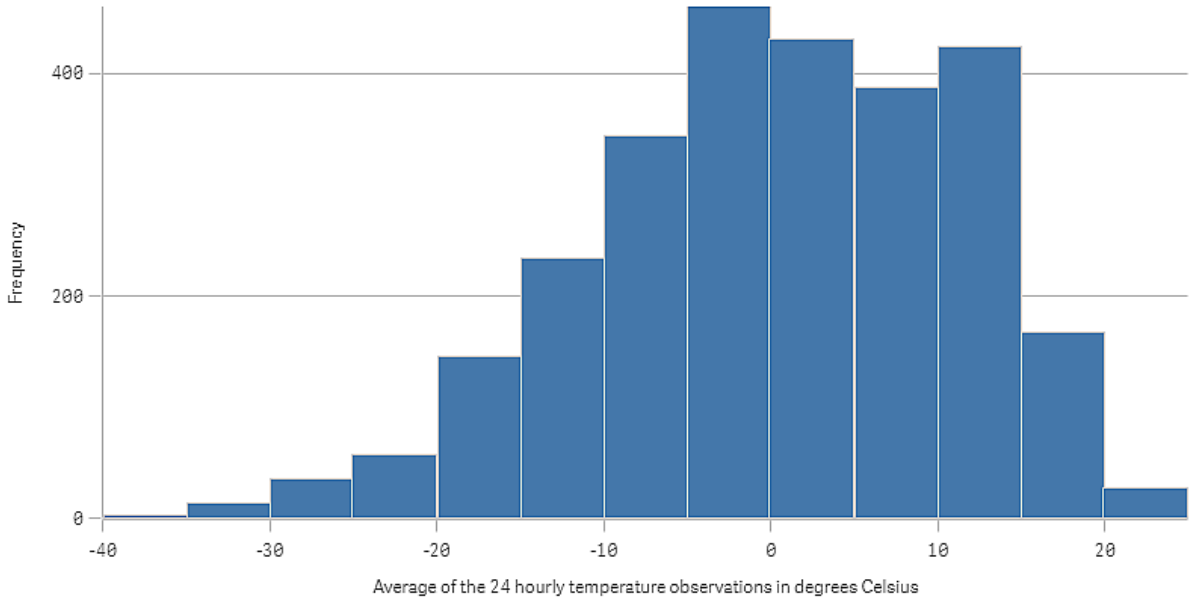
The dataset that is loaded contains a daily average temperature measurement from a weather station in the north of Sweden during the time period of 2010 to 2017.

Visualization

We add a histogram to the sheet and add the field *Average of the 24 hourly temperature observations in degrees Celsius* as dimension.

The visualization creates a frequency measure automatically, and sorts the temperature measurements into a number of bars according to frequency distribution.

We can adjust the size of the bars to get even intervals, by setting **Bars** to **Custom** and **Bar width (x-axis)** with a width of *5*. This adjusts the bars to be intervals of 5 degrees Celsius.



Discovery

The histogram visualizes the frequency distribution of the temperature measurements. You can hover the mouse over a bar to see more details of the frequency.

We can see that most days, the temperature is between -5 and 15 degrees Celsius. There are days below -30, but they are not many.

Histogram properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Histogram settings

Bars	You can set **Bars** to **Auto** or **Custom**. • **Auto** divides the data into the optimal number of bars based on the current data selection. You do not need to make any other settings. The calculation is based on Sturge's formula. • **Custom** lets you define how to divide the data into bars.
Number of bars	Set **Maximum number** to the number of bars you want to divide the data into.
Bar width (x-axis)	Set **Width** to define how wide each bar is. This is based on the values on the x-axis. You can offset the bars by changing the **Offset** setting. **Example:** If you set **Width** to 2 and keep the default **Offset** setting 0, your bars may be defined 0 to 2, 2 to 4, 4 to 6, and so on. If you change **Offset** to 1, the bars are defined -1 to 1, 1 to 3, 3 to 5, and so on.
Count distinct values only	Select this to exclude duplicate values.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions.
Presentation	**Gridline spacing**: Set this to **Custom** if you want to customize the horizontal gridlines. You can choose between: • **No lines** • **Medium** • **Narrow** **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space.
Colors	You can only set the bar color of the histogram.
Y-axis: Frequency	**Position**: Select where to display the measure axis. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
X-axis: <Dimension>	**Position**: Select where to display the dimension axis.

KPI

The KPI visualization can show one or two measure values, and is used to track performance.

A KPI visualization with two measure values, using conditional colors and symbols

When to use it

Use KPIs to get an overview of performance values that are central to an organization. Use color coding and symbols to indicate how the figures relate to the expected results.

Advantages	Disadvantages
KPIs give a quick understanding of the performance within an area.	The KPI is somewhat limited when it comes to graphical components. You can use symbols to help illustrate the performance, but if you want a more conspicuous component, consider using a gauge.

Creating a KPI

You can create a KPI visualization on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty KPI chart to the sheet.
2. Click **Add measure** and select a measure or create a measure from a field.

In a KPI visualization, you can have one or two measures and no dimensions. With two measures, the second value automatically becomes a complementary value and is shown with a smaller font size. You can easily switch their order by dragging the measures in the properties panel under **Measures**.

When you have created the KPI visualization, you may want to adjust its appearance and other settings in the properties panel.

The following settings are used by default in a KPI visualization:

- Centered alignment.
- Black text color.
- Medium font size.
- No titles.
- Measure label displayed.
- Conditional colors and symbols are turned off.
- No link to sheet.

If you double-click or drag a measure from the assets panel, a KPI visualization is added on the sheet using the measure.

Using conditional colors and symbols

When you use conditional colors for your KPI visualization, you have the option to use symbols to be displayed next to your measure value. Additionally, you can use the following options:

- Set range limits.
- Add limits to create subsections with different colors to indicate performance, for example, good (green), below expectations (yellow), or critical (red).
- Add symbols to the values.
- Use gradient coloring between color sections.

You can use expressions to set the limits. All these settings are done in the properties panel that is displayed on the right-hand side of the window when editing a sheet.

Linking to another sheet

You can link from the KPI visualization to a sheet in the app. When making data analysis and clicking the visualization, you can click a second time to go to a predefined sheet. The sheet is opened in a new tab. When hovering over , the name of the sheet is displayed. The icon is only displayed when **Show title** is selected, under **Presentation**.

KPI properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add measure	On the **Data** tab, under **Measures**, click **Add measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add measure** is dimmed, you cannot add more measures.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

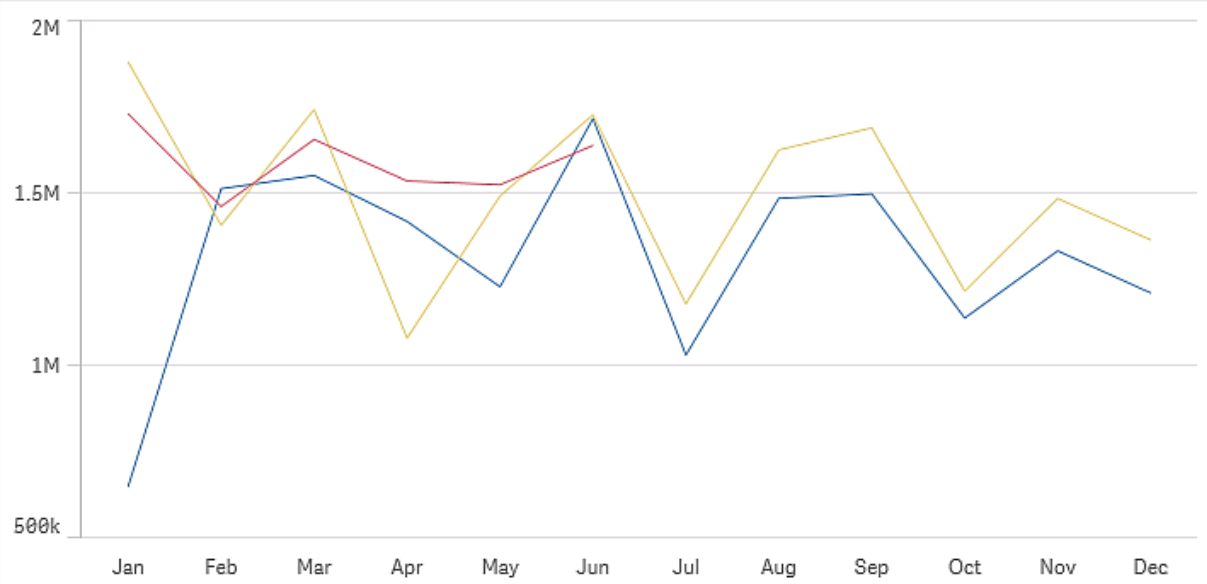
Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.
Presentation	**Show title**: **On** by default. When selected, the measure title is displayed above the KPI value. **Alignment**: Set the alignment of the KPI value and the title. **Font size**: Set the font size of the measure value. **Link to sheet**: **Off** by default. When selected, you can link from the KPI to any sheet in the app. Select the sheet in the list.

Color	**Conditional colors**: When used, you can add range limits and use different colors and symbols for the different sections. **Add limit**: Use the slider to set the limit. You can add several sections. Click the section to change color. You can use an expression as a limit. Click *fx* if you want to create an expression. **Remove limit**: Click to remove the selected limit. **Gradient**: Select to use different shades of colors in the transition between the sections. **Remove limit** : Click to remove the selected limit. If no limit is selected, the most recently added limit is removed.

Line chart

The line chart is used to show trends over time. The dimension is always on the x-axis, and the measures are always on the y-axis. The orientation cannot be changed to vertical.



Your data set must consist of at least two data points to draw a line. A data set with a single value is displayed as a point.

If you have a data set where data is missing for a certain month, you have the following options for showing the missing values:

- As gaps
- As connections
- As zeros

When a month is not present at all in the data source, it is also excluded from the presentation.

When to use it

The line chart is primarily suitable when you want to visualize trends and movements over time, where the dimension values are evenly spaced, such as months, quarters, or fiscal years.

Advantages	Disadvantages
The line chart is easy to understand and gives an instant perception of trends.	Using more than a few lines in a line chart makes the line chart cluttered and hard to interpret. For this reason, avoid using more than two or three measures.

Creating a line chart

You can create a line chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty line chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

When you have created the line chart, you may want to adjust its appearance and other settings in the properties panel.

In a line chart you need at least one dimension and one measure.

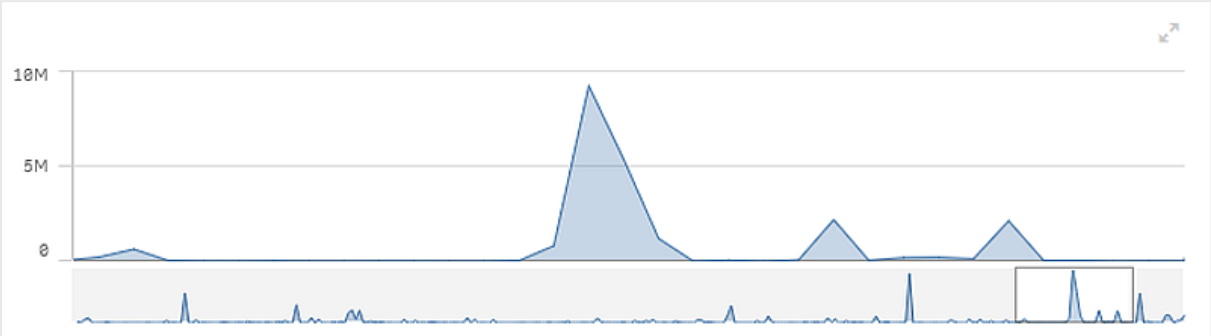
You can include up to two dimensions and one measure, or one dimension and up to 15 measures in a line chart.

Dimensions	Measures	Result
1 dimension	1 measure	A simple line chart with a single line.
2 dimensions	1 measure	A line chart with the first dimension on the X-axis, and a line for each value of the second dimension.
1 dimension	up to 15 measures	A line chart with one line for each measure.

Display limitations

Displaying large numbers of dimension values

When the number of dimension values exceeds the width of the visualization, a mini chart with a scroll bar is displayed. You can scroll by using the scroll bar in the mini chart, or, depending on your device, by using the scroll wheel or by swiping with two fingers. When a large number of values are used, the mini chart no longer displays all the values. Instead, a condensed version of the mini chart (with the items in gray) displays an overview of the values, but the very low and the very high values are still visible.



Line chart with mini chart

Displaying out of range values

In the properties panel, under **Appearance**, you can set a limit for the measure axis range. Without a limit, the range is automatically set to include the highest positive and lowest negative value, but if you set a limit you may have values that exceed that limit. When a data point value cannot be displayed, due to the range limits, an arrow indicates the direction of the value.

When a reference line is out of range, an arrow is displayed together with the number of reference lines that are out of range.

Displaying large amounts of data in a line chart

When displaying large amounts of data in a line chart, the message "**Currently showing a limited data set.**" is shown to indicate that not all data is displayed. The approximate limit for the number of data points that can be displayed in a line chart is 10000. Above that number, data points are neither displayed, nor included in selections made in the line chart.

To avoid displaying limited data sets, you can either make a selection or use dimension limits in the properties panel.

The initial data load is 500 dimension values or dimension stacks. (The value 500 refers to the outer dimension values, not each dimension value in a stack.) When you have scrolled past those 500 values, an incremental load is performed, where values are instead loaded based on the current view or scroll position.

Line chart properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**. This option is not available in box plot dimensions.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.
Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	**Line**/**Area**: Select to display the chart as a line or as an area. **Scroll alignment**: Set the position of the chart scroll bar. By default the scroll alignment is set to **Start**. **Stacked area**: When selected, the different areas are displayed on top of each other. Only available with **Area** style. **Stack positive and negative values separately**: Only available with **Area** style. **Missing values** Set how to show missing values. **Show as gaps** The line has a gap, which represents the missing value. **Show as connections** The line connects the values that exist on either side of the missing value. If the missing value is first or last, no line is drawn. **Show as zeros** The line is drawn to zero and from there to the next existing value. If the missing value is first or last, no line is drawn. **Show data points**: When selected, the data points are displayed. **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space. **Grid line spacing**: Select the spacing of the grid lines. The **Auto** setting is **Medium**.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color.

	Multicolored Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Use library colors**: Option available when a master dimension or master measure used in the visualization has a color assigned to it. You can select to use the master item colors or to disable the master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. Only available with **Single color** and **Multicolored** settings. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: • **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. • **Sequential classes**: The transition between the different color groups is made using distinctly different colors. • **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. • **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

	Reverse colors: When selected, the color scheme is reversed. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis: <Dimension>	**Labels and title**: Select what to display of labels and title. **Label orientation**: Select how to display the labels. **Position**: Select where to display the dimension axis. **Continuous**: When selected, a scale that shows the relative distance between each data point is used. By default, this scale provides a view of the entire dataset.
Y-axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the measure axis. **Scale**: Set the spacing of the measure axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values. **Logarithmic**: When selected, a logarithmic scale is used for the measure values. To be able to use a logarithmic scale, the values must be all positive or all negative.

Map

Maps can be used for a wide variety of purposes. A common use in business intelligence is to plot sales data per region or per store.

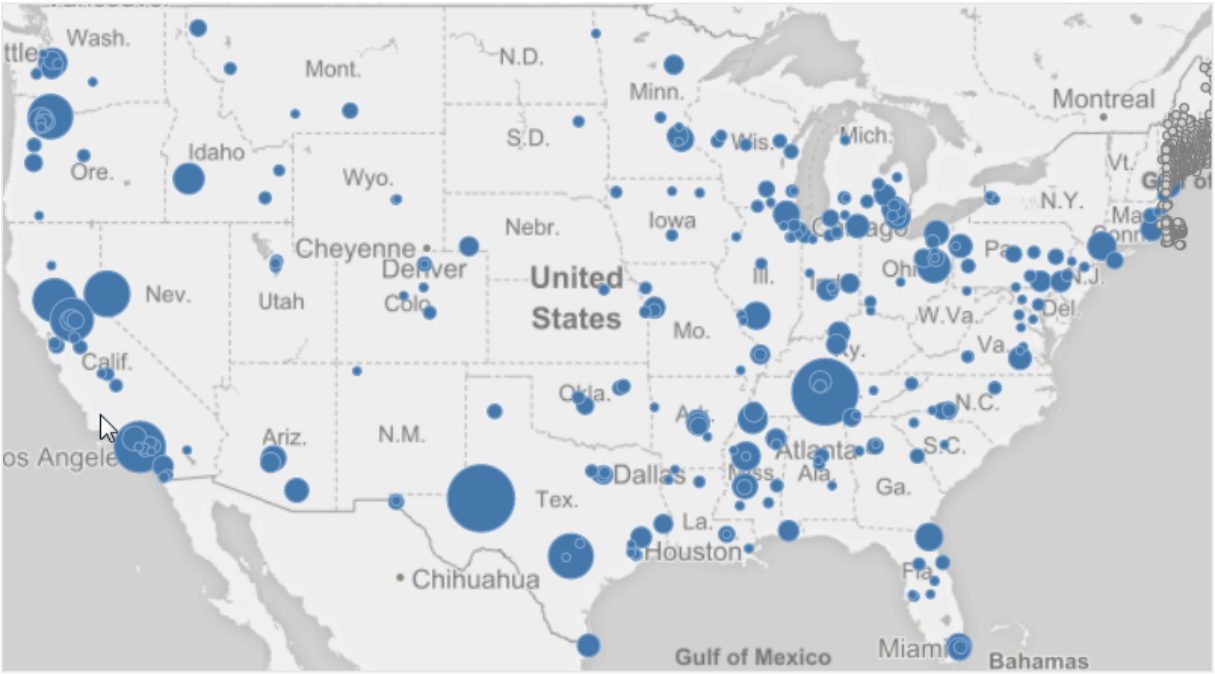
You can create a map by using either a point layer (KML or Excel file) or an area layer (KML file).

Maps with a point layer

A point layer map is typically used to mark places of interest, such as airports or office locations, using longitude and latitude coordinates.

In a simple implementation of a map with a point layer, all bubbles look the same. But by using an expression or a measure, you can let the bubble size reflect the value. In the properties panel, add an expression to the point layer, or drag a measure from **Master items** in the assets panel to the visualization.

You can also use coloring by measure or by expression to show differences in values.



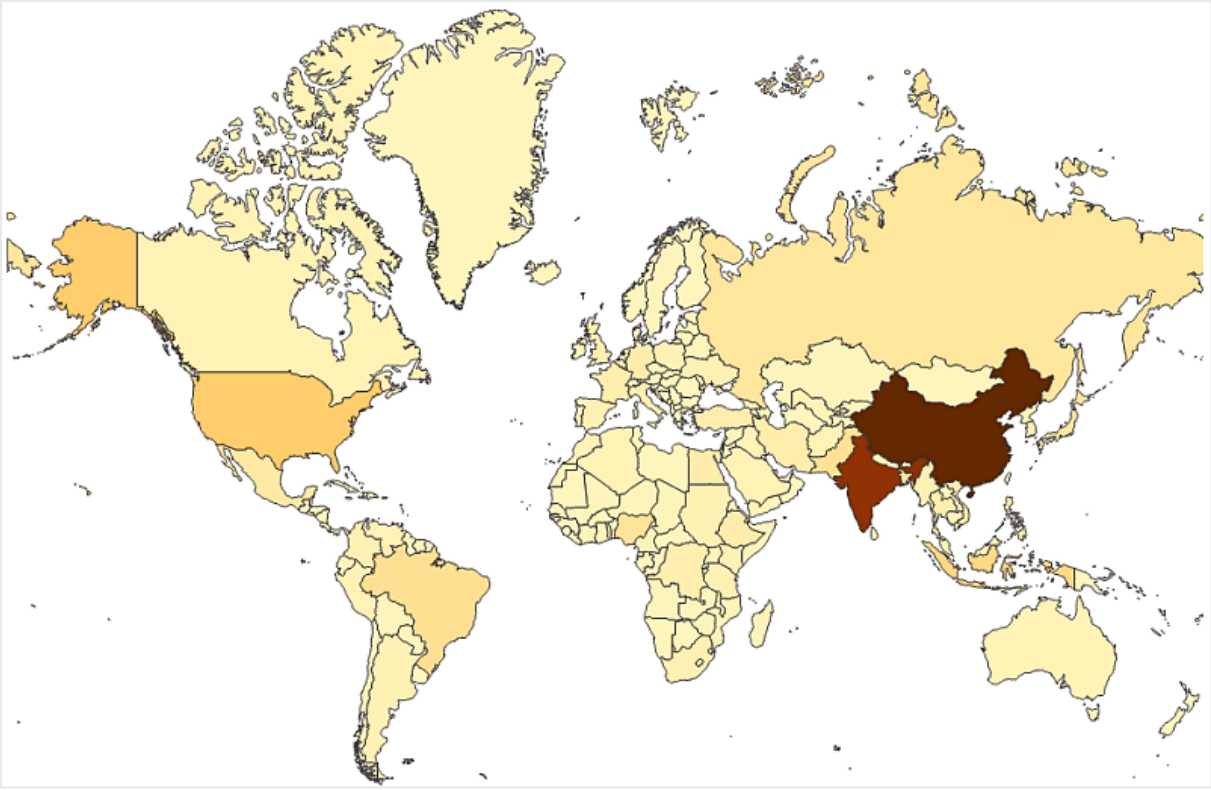
If you use a point layer, you also need a background map to provide the context for the points. Otherwise you will only have a collection of points on an empty background. By default, a Mapbox background map is added to a point layer. If you want to, you can use a map from a different provider.

Maps with an area layer

An area map can be used to display geographical areas, such as countries.

If you use an area layer, you often do not need a background map, but there is support for complementing an area layer with a background.

With an area layer, each subarea is a dimension value. By using colors, you can differentiate between measure values. In the properties panel, under **Appearance** > **Colors and legend**, switch **Colors** to **Custom** where the options **By measure**and **By expression** are available.



When to use it

You can use a map to show the geographical distribution of offices, stores, and other sites of business interest. You can visualize not only locations but also sales values and other measures and display the value differences by bubble size or color.

Advantages	Disadvantages
The map is a versatile visualization that efficiently presents the geographical distribution of key values related to location or area.	With a large number of values, it may be hard to get a good overview. Values may be placed on top of each other and not visible until zoomed in.

Creating a map

To be able to create a map, you first need to load point data (Excel or KML file) or area data (KML file) as described in the topic Loading map data in the Manage data guide.

You can add a map to the sheet you are editing.

You can create several map visualizations based on different point data or area data, but which use the same dimension data.

Do the following:

1. From the assets panel, drag an empty map to the sheet.
2. Click **Add dimension** and select a dimension or a field.
   Geo fields are marked with .
3. Select a field to represent point or area names on the map.
4. Add a dimension or measure to the map (optional).
   Dimensions can be used to color a map.
   Measures can be used to color a map or set the size of points on a point layer map.

You can only use a single dimension type: point or area. You can create an expression in the dimension. If you add a measure from the master items to the map, the measure is added in the expression box under **Data** > **Layers** > **<layer type>** in the properties panel.

When you have created the map, you may want to adjust its appearance and other settings in the properties panel.

Adding a background map

You can add a background map to both point maps and area maps. However, if you have added a point layer to your map, a CartoDB background map is automatically added. You can use maps from other providers.

Do the following:

1. In the toolbar, click **Edit**.
2. In the properties panel to the right, click **Background**.
3. Switch **Show** to **On**.
4. Switch **Map service** to **Custom**.
5. After **URL**, enter the URL to a slippy map server.
   For example, *http://a.tile.opencyclemap.org/cycle/${z}/${x}/${y}.png* .
6. After **Attribution**, enter the attribution string for the map.
   For example, *© OpenCycleMap. Map data © OpenStreetMap contributors*.

Map properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

You need an area layer or a point layer to visualize map data.

Do the following:

1. Click **Add layer**.
2. Select a geo field containing area or point data. Geo fields are marked with .
3. Select a field to represent point or area names on the map.

Layers

<Layer type>	Click the layer name to open the settings. If you want to delete the layer, long-touch/right-click the layer and select **Delete** in the dialog. Alternatively, click the layer and click **Delete** .
Dimension	
Field	Shows the name of the field or dimension that is used for the layer.
Includenull values	By default, selected. A null value is displayed as an **x** in the map.
Show excluded	Select **Show excluded** to also display the excluded selections in the map. When left unselected, the map will automatically zoom to show only the included areas of the map. **Show excluded** is only displayed for area layer maps.
Measure (Point map only)	
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Add an expression to the dimension value. You can visualize the differences in value by selecting the option **Use size**.
Label	Enter a label for the expression. If you have used a field from the assets panel, to create an expression, the expression name is automatically displayed.

Include zero values	When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Bubble size	Use the slider to set the size of the bubbles.
Range	By default, **Auto**, which means that the range is set by the measure values. When set to **Custom**, you can set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
Opacity	Use the slider to set the opacity of the point or area layer. The opacity defines how much is blocked; it is equivalent to setting transparency, or how much is visible.
Show	Select **Show** to display the area layer or the point layer. By default, it is selected.
Delete 🗑	Button for deleting the layer.

Background

Show	Select **Show** to display the background image. By default, it is on.
Map service	By default, **Auto**, which means that a Mapbox background map is automatically added to a point layer. To use other map providers, click the button to switch to **Custom** and enter URL and attribution for the map.
Type	Select the background image type. Currently, slippy map is the only type available.
URL	Enter the URL of the tile server that you want to use. Click the link at the bottom of the section to go to a help page with the available URLs and attributions.
Attribution string	Enter the attribution string that corresponds to the URL. Click the link at the bottom of the section to go to a help page with the available URLs and attributions.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.
Presentation	**Navigation**: By default, off. When set to **Auto**, the navigation tool is displayed, with options to pan and zoom. **Auto-zoom on selection**: By default, selected. When a selection is confirmed, the map automatically zooms in on the selected area.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. If you want to color using a measure added from the assets panel or an expression to the layer under **Data** in the properties panel, you must color the map with **By measure**. Coloring by measure reflects the measure value differences, and is normally what you want to use when adding a measure or an expression. **Single color**

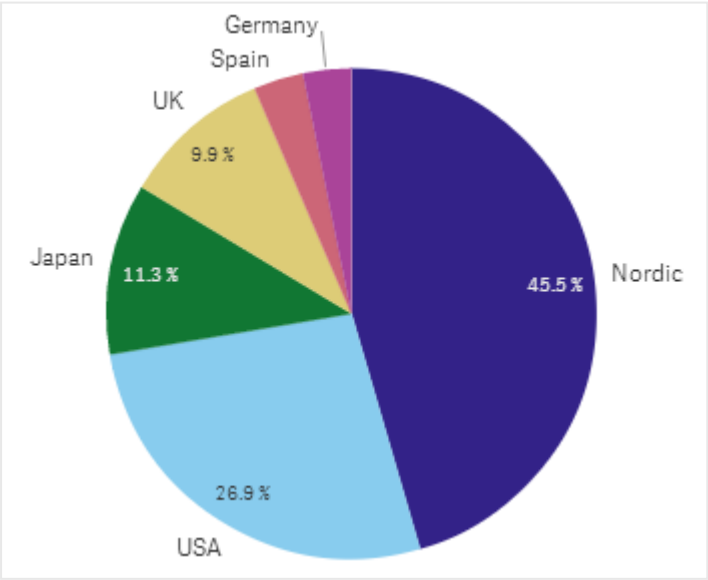
	A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Use library colors**: Option available when a master dimension used in the visualization has a color assigned to it. You can select to use the master dimension color or to disable the master dimension color. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. **Sequential classes**: The transition between the different color groups is made using distinctly different colors. **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors. **Reverse colors**: When selected, the color scheme is reversed. **Range**: By default, **Auto**, which means that the range is set by the measure values. When set to **Custom**, you can set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values. **By expression** You can use coloring by expression to accentuate certain values. Supported

	formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.

Pie chart

The pie chart displays the relation between values as well as the relation of a single value to the total. You can use a pie chart when you have a single data series with only positive values.

In the pie chart, the dimensions form sectors of the measure value. You can include one measure and one dimension in a pie chart.



Sales per region in a pie chart

When to use it

The primary use of a pie chart is to compare a certain sector to the total. The pie chart is particularly useful when there are only two sectors, for example yes/no or queued/finished.

We do not recommend that you compare the results of two pie charts with each other.

Advantages	Disadvantages
The pie chart provides an instant understanding of proportions when few sectors are used as dimensions. When you use 10 sectors, or less, the pie chart keeps its visual efficiency.	It may be difficult to compare different sectors of a pie chart, especially a chart with many sectors. The pie chart takes up a lot of space in relation to the values it visualizes.

Creating a pie chart

You can create a pie chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty pie chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

The following settings are used by default in a pie chart:

- The top 10 sectors are presented in descending size order, clockwise.
- Colors are presented by dimension.
- Value labels are presented in percent.

When you have created the pie chart, you may want to adjust its appearance and other settings in the properties panel.

Pie chart properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.

Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.
Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Sorting

Drag the dimension and measure to set the sorting priority order. The numbers show the order.

The dimension and measure can be sorted internally. Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	**Pie/Donut**: Select to present the chart as a pie or as a donut. **Dimension label**: When set to **Auto**, the label is displayed if there is enough space. **Value labels** **Auto**: The measure values are displayed as a percentage of the whole. **Custom**: Select how to display the measure values. **None**: No measure values are displayed. **Share**: The measure values are displayed as a percentage of the whole (default setting). **Values**: The regular measure values are displayed.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Multicolored** Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Use library colors**: Option available when a master dimension or master measure used in the visualization has a color assigned to it. You can select to use the master item colors or to disable the master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. Only available with **Single color** and **Multicolored** settings. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

Persistent colors: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**.

Color scheme: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors.

By measure

By default, **Sequential gradient** is selected. The higher the measure value, the darker the color.

Color scheme: You have the following four options:

- **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues.
- **Sequential classes**: The transition between the different color groups is made using distinctly different colors.
- **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light.
- **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

Reverse colors: When selected, the color scheme is reversed.

By expression

You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL.

Expression: Enter the expression that you want to use. Click *fx* to open the expression editor.

The expression is a color code: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients.

When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the

	color range. **Show legend**: Not available when **Single color** is selected. By default set to **Off**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.

Pivot table

The pivot table presents dimensions and measures as rows and columns in a table. In a pivot table you can analyze data by multiple measures and in multiple dimensions at the same time. You can rearrange the measures and dimensions to get different views of the data. The activity of moving measures and dimensions interchangeably between rows and columns is known as “pivoting”.

Customer / Product Group / Item	Measures: Quantity	Measures: Sales
Totals	1,818,294	$105,134,346.96
A-2-Z Solutions	1,418	$196,298.49
A-ARVIN Laser Resources	25	$4,053.05
A Superior System	868	$103,728.12
A&B	891	$92,120.60
A&G	133	$12,502.61
A&R Partners	156	$30,392.45
A1 Datacom Supply	5,830	$259,599.52
a2i	14	$451.64
A2Z Solutions	454	$69,977.36
AA-Wizard	917	$94,209.44
Aadast	881	$351,243.31
Aaron D. Meyer & Associates	1,869	$90,017.11
Aaron Products	25	$4,901.96
Abacus Niagara	263	$48,161.07

When to use it

The pivot table is particularly useful when you want to include several dimensions or measures in a single table, and then want to reorganize them to see different subtotals.

Advantages	Disadvantages
The pivot table is very powerful when you want to analyze multiple dimensions and measures at once, and then reorganize them to get a different perspective on your data. Another advantage is that you can expand the rows you are interested in while keeping the rows in the rest of the table collapsed.	The pivot table may seem a bit complicated, and does not give insights at a glance.

Creating a pivot table

You can create a new pivot table on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty pivot table to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

When you have created the pivot table, you may want to adjust its appearance and other settings in the properties panel.

Pivoting

When you want to rearrange your data to get a new view, you drag the items to the new place, either to a column or a row. In the following pivot table, the dimension *Customer* has been dragged to the position after *Product Group* and the dimension *Item* to the position before *Product Group*. As a consequence, the dimensions are now sorted by *Item*, primarily. Focus has shifted from *Customer* to *Item*. By expanding the dimensions you can find out the quantities and sales for each customer, but there is another way to achieve that goal.

Item ▾ Product Group ▾ Customer ▾	Measures	
	Quantity	Sales
American Beef Bologna	166	$4,346.12
American Chicken Hot Dogs	173	$15,115.88
American Cole Slaw	156	$3,979.37
American Corned Beef	1,771	$211,676.74
American Foot-Long Hot Dogs	52	$2,267.24

By moving the dimension *Customer* from rows to columns, you retain focus on the dimension *Item*, but you also get the distribution of items per customer. The move has made the pivot table more information dense.

Item / Product Group	Customer / Measures					
	Totals		A-2-Z Solutions		A-ARVIN Laser Resources	
	Quantity	Sales	Quantity	Sales	Quantity	Sales
Even Better Large Curd Cottage Cheese	195	$6,450.72	-	-	-	-
Even Better Low Fat Cottage Cheese	161	$18,115.97	2	$240.82	-	-
Even Better Low Fat Sour Cream	38	$3,435.48	-	-	-	-
Even Better Low Fat String Cheese	208	$48,298.08	-	-	3	$20.22
Even Better Mild Cheddar Cheese	145	$59,564.85	2	$1,105.01	4	$2,560.05
Even Better Muenster Cheese	21	$16,589.88	-	-	-	-
Even Better Sharp Cheddar Cheese	6,079	$431,143.00	-	-	1	$640.01
Even Better Sour Cream	19	$472.97	-	-	-	-

Measure grouping

As you may have noticed, *Quantity* and *Sales* are not presented as separate measures in the top column row. Next to the dimension *Customer*, you find an item called *Measures*. When you use more than one measure, the measures are automatically grouped together forming a measure group, *Measures*, which as a whole can be added to the rows section or the columns section. The measure group is not editable in the table. You cannot split the measure item and use one measure as a row and another as a column, nor can you change the order in which the measures are presented. Changes to the *Measures* item are made in the properties panel.

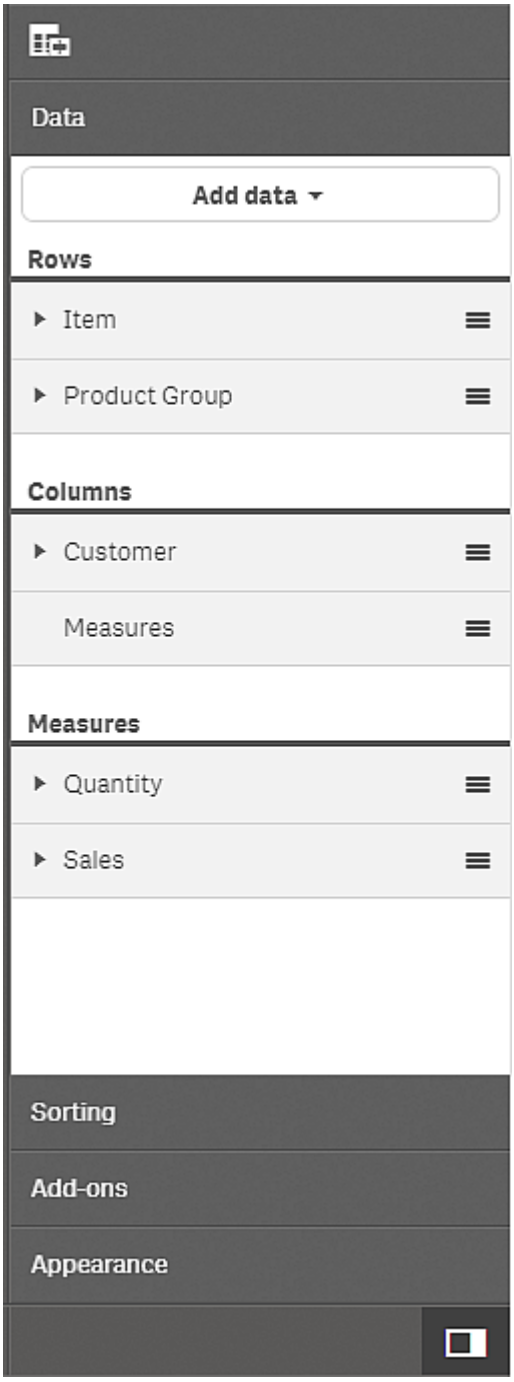
Different ways of pivoting

Essentially, pivoting involves dragging the dimensions and measures from rows to columns and columns to rows, but you have two options for performing the pivoting.

- In the pivot table (both when editing and when analyzing).
- In the properties panel (only when editing).

Pivoting using the properties panel

In the properties panel, you can add measures and dimensions to the pivot table, and also move the dimensions and measures to rows or columns. When you use more than one measure, the measures are grouped and a *Measures* item is created. You can change the internal order of the dimensions and measures, but when you have more than one measure, it is always the whole measure group that you move.



Global grouping

With global grouping you use a limited data set, and in that data set, you single out values that you want to focus on, for example, the best quarters, the top sales persons, or the worst selling products.

You can regard global grouping as a two-step procedure. First you apply a limitation to a data set, and then, in the resulting list, you apply the same limitation again to the inner dimension (that is, the dimension that is second in the sorting hierarchy), to only show results for the singled out inner dimension values.

Example:

In the following pivot table, no limitation is applied. The values are sorted on *Sales*, descending. The list is long, the values for 2013 are not shown.

Year ▾ / Sales Rep Name ▾	sum(Sales)
2014	**$41,006,958.72**
Judy Thurman	$6,037,992.86
Stewart Wind	$4,717,671.77
Lee Chin	$3,535,768.74
Cheryle Sincock	$1,791,498.68
Brenda Gibson	$1,750,292.96
John Greg	$1,443,128.30
Martha Richard	$1,388,402.75
Amalia Craig	$1,200,853.57
David Laychak	$1,170,791.14
Karl Anderson	$957,467.35
Max Blagburn	$940,446.81
David Howard	$850,575.53
Angelen Carter	$810,618.88
Amanda Honda	$704,245.66
Amelia Fields	$635,124.63
Donna Brown	$603,055.39
Peggie Hurt	$525,843.84
Craig Amundson	$495,495.93
Micheal Williams	$469,046.29

In the following pivot table, a limitation has been applied to the (inner) dimension *Sales Rep Name*, so that only the top five sales representatives for the years 2013 and 2014 are shown.

Year ▾ / Sales Rep Name ▾	Sum(Sales)
2014	**$41,006,959.00**
Judy Thurman	$6,037,993.00
Stewart Wind	$4,717,672.00
Lee Chin	$3,535,769.00
Cheryle Sincock	$1,791,499.00
Brenda Gibson	$1,750,293.00
2013	**$38,657,267.00**
Stewart Wind	$5,669,097.00
Judy Thurman	$4,951,304.00
Lee Chin	$3,685,579.00
John Greg	$2,104,622.00
Cheryle Sincock	$1,353,069.00

The next step is to select global grouping in the properties panel. The option **Global grouping** is only available when you have applied a limitation on the dimension.

When global grouping is selected, the limitation of the top five sales representatives is applied again, but this time regardless of the dimension *Year*. The five sales representatives with the highest sales (either in 2013 or 2014) are the only ones that will be presented in the final pivot table.

The following image shows the six highest results for 2014 and 2013. The top four results are from 2014, but the fifth (John Greg) is from 2013. Because five other sales representatives have higher sales than *Brenda Gibson* (who was number five in 2014), she is knocked out of the list.

Judy Thurman	$6,037,993.00
Stewart Wind	$4,717,672.00
Lee Chin	$3,535,769.00
John Greg	$2,104,622.00
Cheryle Sincock	$1,791,499.00
Brenda Gibson	$1,750,293.00

The following image shows the pivot table with global grouping applied. The pivot table only contains the sales results for the top five sales representatives. Even though *Brenda Gibson* had a better result in 2014 than John Greg, his result for 2013 qualified him for the top five list.

Year ▾ / Sales Rep Name ▾	Sum(Sales)
2014	**$41,006,959.00**
Judy Thurman	$6,037,993.00
Stewart Wind	$4,717,672.00
Lee Chin	$3,535,769.00
John Greg	$1,443,128.00
Cheryle Sincock	$1,791,499.00
2013	**$38,657,267.00**
Judy Thurman	$4,951,304.00
Stewart Wind	$5,669,097.00
Lee Chin	$3,685,579.00
John Greg	$2,104,622.00
Cheryle Sincock	$1,353,069.00

Pivot table example

The efficiency of a pivot table can be illustrated by comparing a regular table with a pivot table that has the same data. In the following table, you have three dimensions: Customer, Product Group, and Item, and two measures: Quantity and Sales.

The table shows the sales of some food products. If you want to rearrange the data to simplify analysis, the options are somewhat limited. You can change the order of the columns, but that does not improve the overview. You can also set the sorting order, either in the sorting section in the properties panel, or by clicking the dimension columns. However, the problem persists. The customers, product groups, and items are all presented more than once, and it is not possible to get a good summary of the data.

Customer	Product Group	Item	Quantity	Sales
Totals			**1,818,294**	**$104,852,674.81**
A-2-Z Solutions	Alcoholic Beverages	Good Light Wine	2	$337.58
A-2-Z Solutions	Alcoholic Beverages	Pearl Chardonnay	8	$513.89
A-2-Z Solutions	Alcoholic Beverages	Pearl Light Beer	1	$60.10
A-2-Z Solutions	Alcoholic Beverages	Walrus Light Wine	7	$34.69
A-2-Z Solutions	Baked Goods	Colony Pumpernickel Bread	2	$9.54
A-2-Z Solutions	Baked Goods	Colony Wheat Bread	1	$74.73
A-2-Z Solutions	Baked Goods	Great Blueberry Muffins	3	$149.02
A-2-Z Solutions	Baking Goods	BBB Best Apple Butter	6	$211.35
A-2-Z Solutions	Baking Goods	BBB Best Apple Preserves	2	$276.20
A-2-Z Solutions	Baking Goods	BBB Best Extra Chunky Peanut Butter	1	$617.40
A-2-Z Solutions	Baking Goods	BBB Best Grape Jam	1	$33.75
A-2-Z Solutions	Baking Goods	BBB Best Pepper	4	$328.97

Here is the same data in a pivot table.

Customer / Product Group / Item	Measures: Quantity	Measures: Sales
Totals	**1,818,294**	**$105,134,346.96**
A-2-Z Solutions	**1,418**	**$196,298.49**
A-ARVIN Laser Resources	**25**	**$4,053.05**
A Superior System	**868**	**$103,728.12**
A&B	**891**	**$92,120.60**
A&G	**133**	**$12,502.61**
A&R Partners	**156**	**$30,392.45**
A1 Datacom Supply	**5,830**	**$259,599.52**
a2i	**14**	**$451.64**
A2Z Solutions	**454**	**$69,977.36**
AA-Wizard	**917**	**$94,209.44**
Aadast	**881**	**$351,243.31**
Aaron D. Meyer & Associates	**1,869**	**$90,017.11**
Aaron Products	**25**	**$4,901.96**
Abacus Niagara	**263**	**$48,161.07**

As you can see, the pivot table presents the data in a much more condensed way, which simplifies analysis and comparison. Compared to the regular table, the number or rows has been halved in the pivot table and the number of columns is three instead of five.

One of the advantages of a pivot table is the interchangeability, that is, the ability to move row items to columns and column items to rows. This flexibility is very powerful and enables you to rearrange the data and have several different views of the same data set. Depending on what you want to focus on, you move the dimensions and measures to bring forward data of interest and hide data that is either too detailed, or irrelevant for the analysis.

The pivot table shows the dimensions *Customer*, *Product Group*, and *Item*, and the measures *Quantity* and *Sales*. In this view, you have a summary of quantity and sales for each customer. If you want to know which items and product groups that the customers bought, you need to expand the customer fields by clicking ⊕ . A ⊕ icon indicates that a field can be further expanded and present more details, while a ⊖ icon indicates that the field can be collapsed, to reduce the number of fields and details.

Pivot table properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a row, column, or a measure. When you select **Row** or **Column**, you can only add dimensions. By default, dimensions are added to the rows section and measures to the columns section. But once an item has been added, you can move it.

Dimension settings

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.

Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Includenull values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.
Global grouping	If a limitation is set, you can use global grouping.
Show totals	Adds a top row in the pivot table showing the total value of the underlying rows. **Show totals** is not available for dimensions (except the first one) when **Indent rows** is selected in the **Appearance** property.
Totals	Enter a label for the totals row.

Measure settings

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, click ⊗ .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are, by default, displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization. Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Background color expression	Enter an expression for the background color. The text color automatically changes to white when a dark background color is used.
Text color expression	Enter an expression for the text color. If you use the same expression as in the background color, the text will not be visible.

Sorting

The dimensions can be sorted internally:

Click the dimension name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

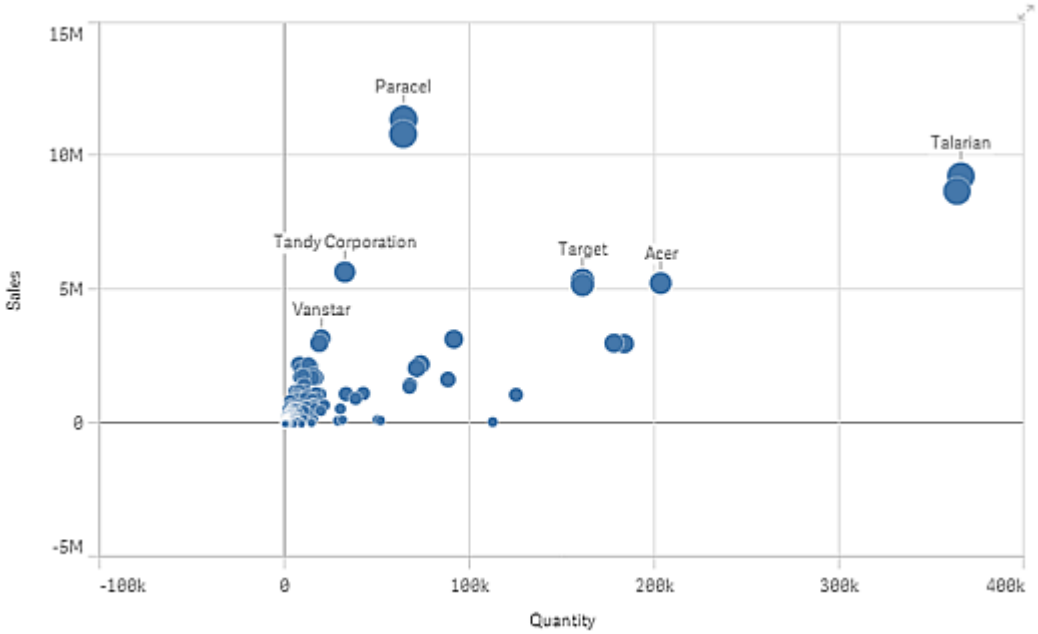
Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value ‘0’ are not included in the presentation. If there is more than one measure value, all the measure values must have the value ‘0’ to be excluded from the presentation.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.
Presentation	**Fully expanded**: When selected, all values in the pivot table are displayed. **Indent rows**: When selected, an indentation is added to the beginning of each row.

Scatter plot

The scatter plot presents pairs of values from two or three measures. This is useful when you want to show data where each instance has two numbers, for example, the relationship between Sales and Quantity per Customer. In the scatter plot below, a third measure (Cost) is used to generate the bubble size.



Example of a scatter plot

The scatter plot presents values from different measures over one dimension as a collection of points. In most charts, you find your dimension on one of the axes, but for a scatter plot, the dimension is represented by the points in the chart, and the measures are found on each of the two axes. When a third, optional, measure is used, its value is reflected in the bubble size. If you are analyzing large data sets and view compressed data, the density of the data points is reflected by color.

When to use it

The scatter plot helps you find potential relationships between values, and to find outliers in data sets. The scatter plot is useful when you want to show data where each instance has at least two metrics, for example, average life expectancy and average gross domestic product per capita in different countries.

Advantages	Disadvantages
The scatter plot is a great way to visualize the correlation of two or more measures at the same time. The third measure is an efficient way of differentiating between values and simplifying the identification of, for example, large countries, large customers, large quantities, and so on.	The scatter plot may be difficult to understand for an inexperienced user, because it has measure value on both axes, and the third, optional, measure adds complexity to the interpretation. Make sure a novice can interpret the scatter plot correctly. Using descriptive labels is a good way to make the visualization easier to interpret. Values may be placed on top of each other and are then not visible until you zoom in.

Creating a scatter plot

You can create a scatter plot on the sheet you are editing.

In a scatter plot you need one dimension and at least two measures. You can have maximum one dimension and three measures, where the third measure is visualized as bubble size.

Do the following:

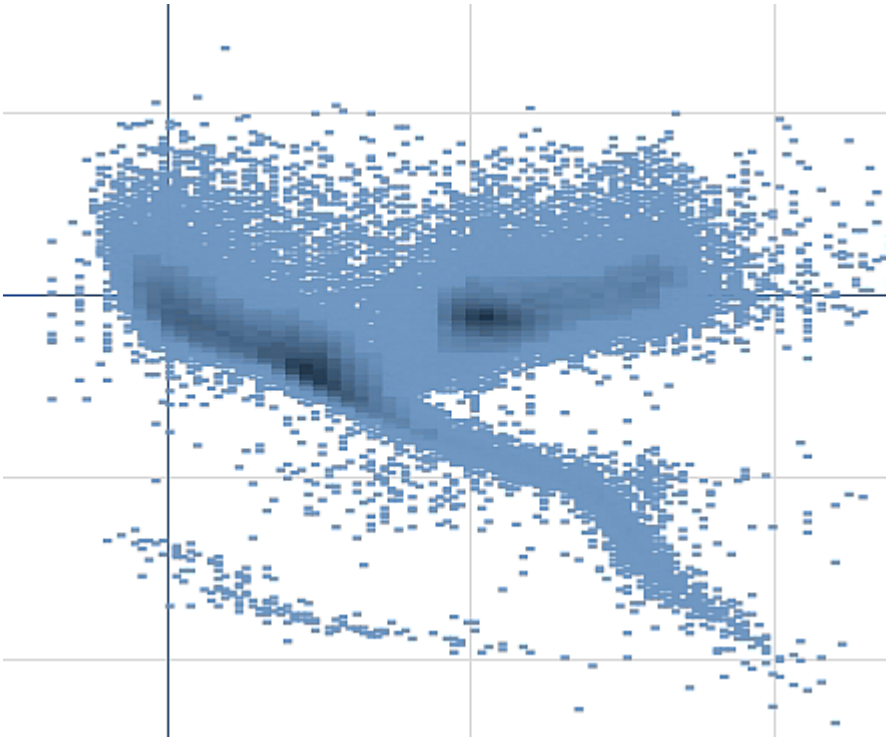
1. From the assets panel, drag an empty scatter plot to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.
4. Click **Add measure** and select a measure or create a measure from a field.
5. Optionally, if you want bubble size to be set according to a third measure:
   Click **Add measure** and select a measure or create a measure from a field.

When you have created the scatter plot, you may want to adjust its appearance and other settings in the properties panel.

Display limitations

Large data sets in scatter plots

If you have a scatter plot with large amounts of data (more than 1000 data points) Qlik Sense uses an algorithm to create an overview of the data, as shown in the scatter plot below. However, if you zoom or make selections so that the number of displayed data points is reduced to less than 1000 data points, the data will be shown as individual bubbles. This switch between compressed view and bubble view is done automatically. The density of the data points is reflected by color.



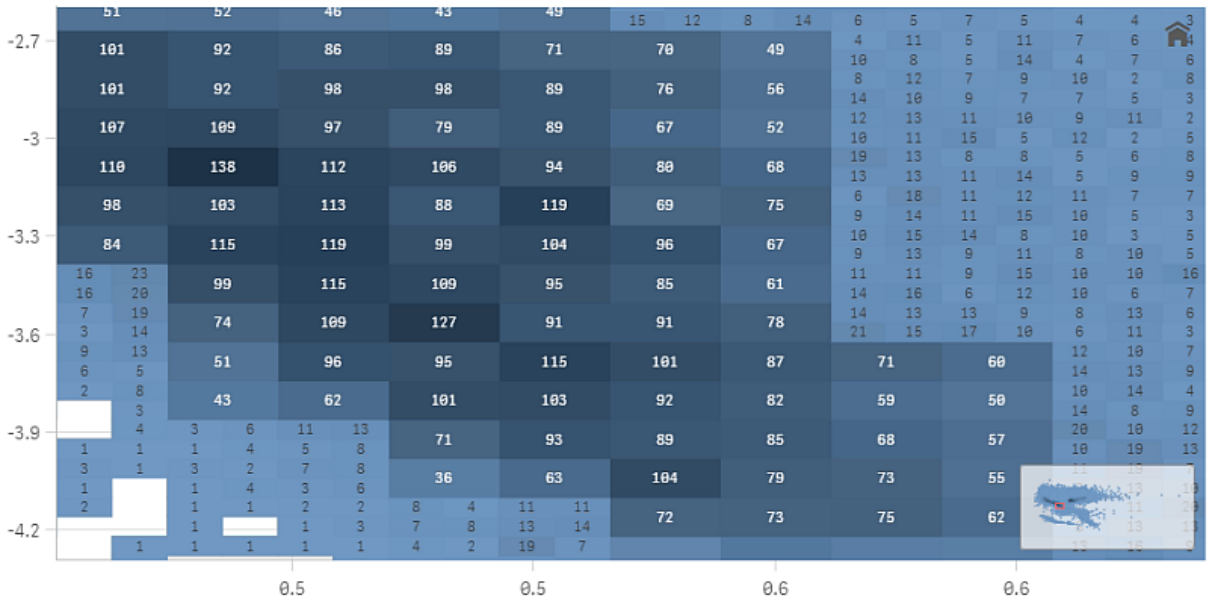
Example of a scatter plot with compressed data

Zooming and panning

In a scatter plot, you can zoom and pan around in your data. The interaction differs depending on what device you are using. If you are zooming in you can see where in the data set you are located by looking at the mini chart in the bottom right corner. If you zoom in on large data sets you will be able to see the data shown as boxes with values inside. The values represent the number of points in each box. If you zoom in so that there are <1000 data points, you will instead see the data points represented by bubbles.

Zooming and panning is not possible when you have made a selection in the compressed data view.

You can change the compression resolution in the visual exploration menu or in the properties panel.



Example of a scatter plot with compressed data

Scatter plot properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.

Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add** or **Add alternative** is dimmed, you cannot add more dimensions.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

Add-ons

X-axis reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.
Y-axis reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.
Data handling	**Include zero values**: When unselected, measures that have the value ‘0’ are not included in the presentation. If there is more than one measure value, all the measure values must have the value ‘0’ to be excluded from the presentation. **Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	**Navigation**: By default, off. When set to **Auto**, the navigation tool is displayed, with options to pan and zoom. **Bubble size**: Set the size of the data point bubbles. For a scatter plot with two measures, this sets the uniform size of all bubbles. For a scatter plot with three measures, this sets the scale of the bubble sizes. In a scatter plot with three measures, the third measure controls the size of each bubble. **Labels**: Select what labels to display: • **Auto**: The number of labels displayed varies with the size of the visualization • **All**: All labels are displayed. This option may cause labels to overlap. • **None**: No labels are displayed. .**Compression resolution**: Set the resolution for compressed data. Only available for large data sets (>1000 data points). **Grid line spacing**: Select the spacing of the grid lines. The **Auto** setting is **Medium**.

Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color**: A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Use library colors**: Option available when a master dimension used in the visualization has a color assigned to it. You can select to use the master dimension color or to disable the master dimension color. **By dimension**: By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range.

	Show legend: Not available when **Single color** is selected. By default set to **Auto**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting.
	Legend position: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the axis. **Scale**: Set the spacing of the axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
Y-axis	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the axis. **Scale**: Set the spacing of the axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.

Table

The table shows several fields simultaneously, where the content of each row is logically connected. Typically, a table consists of one dimension and several measures.

Customer	Sales	Quantity	Margin (%)	# of Invoices	Average Sales per Invoice
Totals	**$104,852,674.81**	**1,816,372**	**4127.8%**	**38,314**	**$2,736.67**
A-2-Z Solutions	$196,298.49	1,418	3841.7%	58	$3,384.46
A-ARVIN Laser Resources	$4,053.05	25	3792.6%	13	$311.77
A Superior System	$103,728.12	868	4074.5%	167	$621.13
A&B	$92,120.60	891	4202.9%	18	$5,117.81
A&G	$12,502.61	133	4708.0%	12	$1,041.88
A&R Partners	$30,392.45	156	3409.9%	6	$5,065.41
A1 Datacom Supply	$259,599.52	5,830	4025.7%	111	$2,338.73
a2i	$451.64	14	5983.7%	9	$50.18
A2Z Solutions	$69,977.36	454	4121.1%	94	$744.44
AA-Wizard	$94,209.44	917	4660.6%	41	$2,297.79

You only make selections in the dimension columns. All dimension columns have a search icon ( ) in the header.

When to use it

Use a table, when you want to view detailed data and precise values rather than visualizations of values. Tables are good when you want to compare individual values. Drill-down group dimensions are very efficient in tables. Within a limited space, you can drill down to the next level of detail and analyze the updated measure values.

Advantages	Disadvantages
You can filter and sort the table in different ways. Many values can be included in a table, and when you drill down in a table, you make good use of a limited space of the sheet. A table is excellent when you want to see exact values rather than trends or patterns.	If the table contains many values, it is difficult to get an overview of how values are related. It is also hard to identify an irregularity within the table.

Creating a table

You can create a new table on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty table to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

When you have created the table, you may want to adjust its appearance and other settings in the properties panel.

Column width is automatically set to keep columns together for improved readability. You can adjust the width of a column by dragging the header divider. Double-click the header divider to reset to the default width.

Aligning data

If **Text alignment** is set to **Auto**, column data is aligned according to data type: text values are left-aligned and number values, including date related values, are right-aligned. If you set it to **Custom**, you can select to align the data to the left or to the right.

Sorting the table

You can adjust the sorting of the table in several ways:

- Column sorting - adjust the order of the dimensions and measures from left to right
- Row sorting - adjust the sorting priority order of the rows
- Internal sorting - use the internal sorting order of dimensions and measures
- Interactive sorting - during analysis you can click on a column header to sort the table

Column sorting

By default, the order in which columns are sorted is set by the order in which dimensions and measures are added to the table. If you add the measure *Sales* first, it is presented first (leftmost) in the table. The next dimension or measure that is added is presented in the second column, and so on. The column sorting order can be changed in the properties panel, under **Columns**.

Row sorting

By default, rows are sorted by the first added dimension or measure, numeric values descending, text values ascending. A small arrow under the column header shows by which column the table is sorted.

You can change the row sorting in the properties panel, under **Sorting**. Drag the dimensions and measures to change the sorting priority order. In many cases, sorting is not only affected by the first dimension or measure in **Sorting**, but also the following ones.

Example:

In the following screenshot, the rows are first sorted by *Customer*, then by *Month*, and then by *Product Type*. As you can see, the columns *Customer* and *Month* have several rows with the same values (*A-2-Z Solutions* and *Month*). The rows in *Product Type* are ordered alphabetically, but only those that were sold in January to the customer *A-2-Z Solutions* are displayed.

Customer	Month	Product Type	Sales
Totals			**$104,852,674.81**
A-2-Z Solutions	Jan	Baking Goods	$248.83
A-2-Z Solutions	Jan	Beer and Wine	$129.25
A-2-Z Solutions	Jan	Breakfast Foods	$68.29
A-2-Z Solutions	Jan	Canned Soup	$45.24
A-2-Z Solutions	Jan	Carbonated Beverages	$187.42
A-2-Z Solutions	Jan	Dairy	$8,262.54
A-2-Z Solutions	Jan	Specialty	$686.59
A-2-Z Solutions	Feb	Beer and Wine	$24.60
A-2-Z Solutions	Feb	Breakfast Foods	$270.72
A-2-Z Solutions	Feb	Canned Soup	$91.80

By changing the sorting order, so that secondary sorting is by *Product Type*, followed by *Month*, all *Product Type* items sold to the customer *A-2-Z Solutions* are presented in alphabetical order, whereas only the months when they were sold are displayed under *Month*.

Customer	Product Type	Month	Sales
Totals			**$104,852,674.81**
A-2-Z Solutions	Baking Goods	Jan	$248.83
A-2-Z Solutions	Baking Goods	Jul	$1,318.04
A-2-Z Solutions	Baking Goods	Nov	$396.00
A-2-Z Solutions	Beer and Wine	Jan	$129.25
A-2-Z Solutions	Beer and Wine	Feb	$24.60
A-2-Z Solutions	Beer and Wine	Apr	$129.25
A-2-Z Solutions	Beer and Wine	Jun	$60.10
A-2-Z Solutions	Beer and Wine	Jul	$129.25
A-2-Z Solutions	Beer and Wine	Oct	$400.65
A-2-Z Solutions	Beer and Wine	Nov	$10.09
A-2-Z Solutions	Beer and Wine	Dec	$63.07
A-2-Z Solutions	Bread	Jul	$158.56
A-2-Z Solutions	Bread	Oct	$74.73

Internal sorting

Each dimension and measure has a default (**Auto**) internal sorting order, which can be changed. Under **Sorting**, click the item you want to change and click the button to switch to **Custom** sorting. Changes made to the internal sorting of an item may not have any effect if the sorting is in conflict with an item with higher priority.

Interactive sorting

During analysis, you can set which column to sort on by clicking the column header. The first click sorts the table according to the default sorting of the selected item. A second click reverses the sorting order. Interactive sorting is session based and is not saved. If you want your changes to the sorting to be persistent, you need to make the changes in the properties panel.

Displaying totals

By default, the totals of numeric values are displayed under the column names. In the properties panel, you can change this to display the totals at the bottom of a column, or not at all.

Displaying more data

You can freeze the first column from scrolling, and select to wrap multiline text in headers and cells separately. These settings are changed in the property panel under **Appearance** > **Presentation**.

Display limitations

Number of rows and columns

In a table, you can have millions of rows and virtually any number of columns with dimensions and measures. But because huge tables are impractical and hard to manage, the limit for what is practical is far less than the theoretical maximum. In most cases, it is desirable to see all the columns without scrolling horizontally.

Tables with content of mixed sizes

In a table you can have both columns where the content fits on one row within the cell, and columns containing wrapped multiline text. In some cases you will see a shift in alignment and number of rows when the multiline column is scrolled in and out of view. When the view only contains content that fits on one row, the table will adjust and show all content on single line rows, which means more rows are displayed.

We recommend that you disable multiline text wrapping in these cases to avoid confusion for the user.

Searching in tables

In a table, you can search the dimension columns, and make selections in the resulting list.

Do the following:

1. Click in the dimension column that you want to search in.
   A selection popup is displayed.
2. Type your search string.
   While you type, the list is filtered to only display matching items.
3. Make a selection by clicking or drawing.
4. Confirm your selection.

   You can confirm the selection of all matching items by pressing Enter.

The new selection is active and reflected in all associated visualizations.

You can remove the search string by clicking or pressing Esc. The search string is always removed when you press return/Enter.

Selections in tables

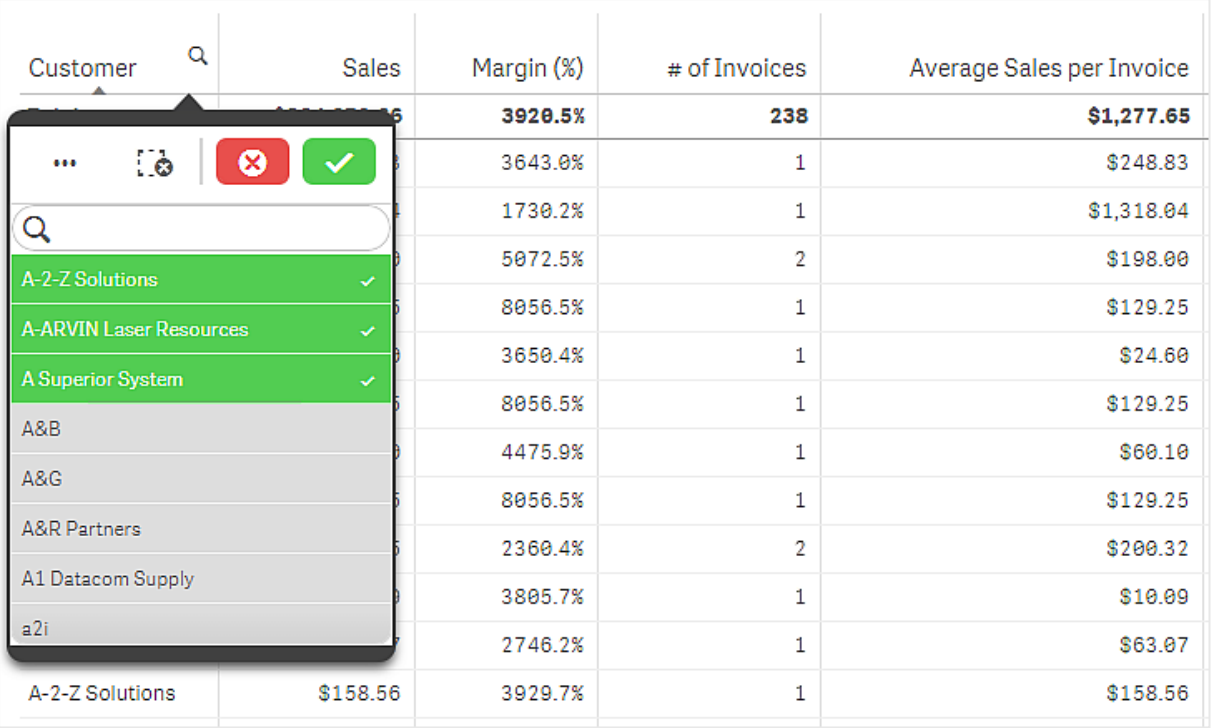


Table with selected fields in green

You can make selections in a table by clicking or drawing in the dimension columns. Measure values cannot be selected. When you make a selection, it is always the dimension values that you select. You can only make selections in one column at a time.

To deselect a row, click it. To confirm a selection, click ✔ or click outside the visualization. You can also press Enter. To cancel, click ✖ or press Esc. If you confirm, the selection is reflected in all visualizations associated with the table.

You cannot select dimension values that are null. Null values in a table are presented as dashes (-). Rows without valid dimension values will not be included in the selection.

Table properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add column** to add a dimension or a measure. Options that are dimmed are not available.

Columns

In the table, the dimensions and measures are presented together under the heading **Columns**.

Dimension settings

Add column	On the **Data** tab, click **Add column** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. A dimension can either be selected from the list of already existing **Dimensions**, or created from the list of available **Fields**. To edit a dimension that is stored as a master item, you must first unlink the dimension from the master item.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Background color expression	Enter an expression for the background color. The text color automatically changes to white when a dark background color is used.
Text color expression	Enter an expression for the text color. If you use the same expression as in the background color, the text will not be visible.
Text alignment	When set to **Custom**, you can select how to display the content: **Align left** or **Align right**. If **Text alignment** is set to **Auto**, the alignment is automatically aligned left or right, depending on the content.
Representation	When set to **Text**, all values are displayed as static text. When set to **URL**, field values that contain a URL are displayed as clickable links. Clickable links open a new browser tab.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.

Measure settings

Add column	On the **Data** tab, click **Add column** and select **Measure** to open a list of available measures. Select the measure that you want to use. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. To edit a measure that is stored as a master item, you must first unlink the measure from the master item.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, click ⊗ .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are, by default, displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization. Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Background color expression	You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When coloring by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range.
Background text expression	
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Background color expression	Enter an expression for the background color. The text color automatically changes to white when a dark background color is used.
Text color expression	Enter an expression for the text color. If you use the same expression as in the background color, the text will not be visible.
Totals function	Select which aggregation function you want to use for the **Totals** row in the table. You set the position of the **Totals** row under **Presentation**.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value ‘0’ are not included in the presentation. If there is more than one measure value, all the measure values must have the value ‘0’ to be excluded from the presentation.

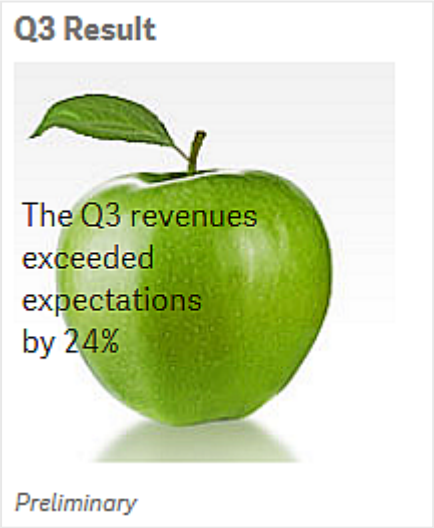
Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	**Totals** **Auto**: The totals (the result of the expression), are automatically included at the top of the table. **Custom**: Select whether to display the totals and where to display them, at the top or bottom. **Totals label**: Set the label for the totals row. You can also use an expression as a label. **Scrolling** You can select to freeze the first column from horizontal scrolling. *It is not possible to freeze the first column on touch devices.* **Multiline text wrapping** You can enable or disable multiline text wrapping in headers and cells separately.

Text & image

The text & image visualization complements other visualizations by offering options to add text, images, hyperlinks, and measures.



You can format and color the text and align the paragraphs. The background image has sizing and positioning options. You can also set the responsive behavior for text and images.

When to use it

The text & image visualization is intended for presentation purposes, and does not support selections. However, the measures in the text & image visualization are updated when selections are made. Some typical uses:

- Use it on the first sheet of an app for essential information.
- Display a company image, or use a background image together with formatted text and measure values to present figures in a compelling way.
- Link to sites with additional information.
- Use the responsive behavior to ensure that the visualization renders well on all devices.

Advantages	Disadvantages
The text & image visualization contrasts with the other visualizations. You have many options for making the text & image visualization stand out next to more regular charts.	You are limited to a few measure values and rather short texts, otherwise the text & image visualization will be cluttered.

Creating a text & image

You can create a text & image visualization on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty text & image chart to the sheet.
2. Click the text & image chart to open the editing toolbar.
3. Add and format text, images, hyperlinks or measures to the text & image chart.

If you double-click a text & image chart in the assets panel, it is added to the sheet immediately.

Editing a text & image

In the text & image visualization you can add and format text, images, measures, and links in various ways.

When you are editing a sheet and the text & image visualization does not have focus, you need to click twice to open the editing toolbar. In the editing toolbar, you can format text properties such as color, size, and style, and also align the text. Additionally, you have options for adding links and images.

Editing toolbar

Creating a link

You can mark a text section and use it for a link.

If you do not add a prefix, *http://* is added automatically, assuming that you are adding a web address.

Do the following:

1. Select the text section that you want to use for the link.
2. Click in the editing toolbar to open the link dialog.
3. Enter the web address that you want to link to.
4. Click .

The link is created.

Removing a link

You can remove a link from a text section.

Do the following:

1. Click the link so that the cursor is somewhere inside it.
2. Click in the editing toolbar to open the link dialog.
3. Click .

The link is removed, but not the text.

Adding an image

You can add an image through the editing toolbar. You can use one of the default images, or an image of your own.

Do the following:

1. Click in the editing toolbar.
   The **Media library** opens.

   The following formats are supported: .png, .jpg, .jpeg, and .gif.
   *For Qlik Sense: You can upload images to the **In app** folder in the media library. You need to use the Qlik Management Console to upload images to the default folder.*
   *For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

2. Click on a folder in the media library, for example **In app** or **Default**.
3. Select the image that you want to add.
4. Click **Insert**.

   *Alternatively, long-touch/right-click the image file you want to add and select **Insert**.*

The image is added.

In the properties panel, you can add a background image, which, for example, can be used when you want to insert text in the image. The images added through the editing toolbar are not background images.

Adding a measure

You can add a measure in the following ways:

- By dragging a field from the assets panel and adding it as a measure.
- By dragging a measure from **Master items**.
- By adding a measure (existing or new) from the properties panel.

When you are editing the measure, it is displayed as a token, which can be styled and moved around in the visualization. You can also apply number formatting to it. When you leave the editor, the measure value is displayed . Values that cannot be aggregated are shown as a hyphen (-).

Deleting a measure

You can delete a measure in the following ways:

- Place the cursor before the token and press Delete.
- Place the cursor after the token and press Backspace.
- In the properties panel, long-touch/right-click the measure and select **Delete** in the dialog.
- In the properties panel, click the measure and click **Delete** .

Text & image properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add measure** and select a measure or create a measure from a field.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number** and **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Add measure	On the **Data** tab, under **Measures**, click **Add measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add measure** is dimmed, you cannot add more measures.

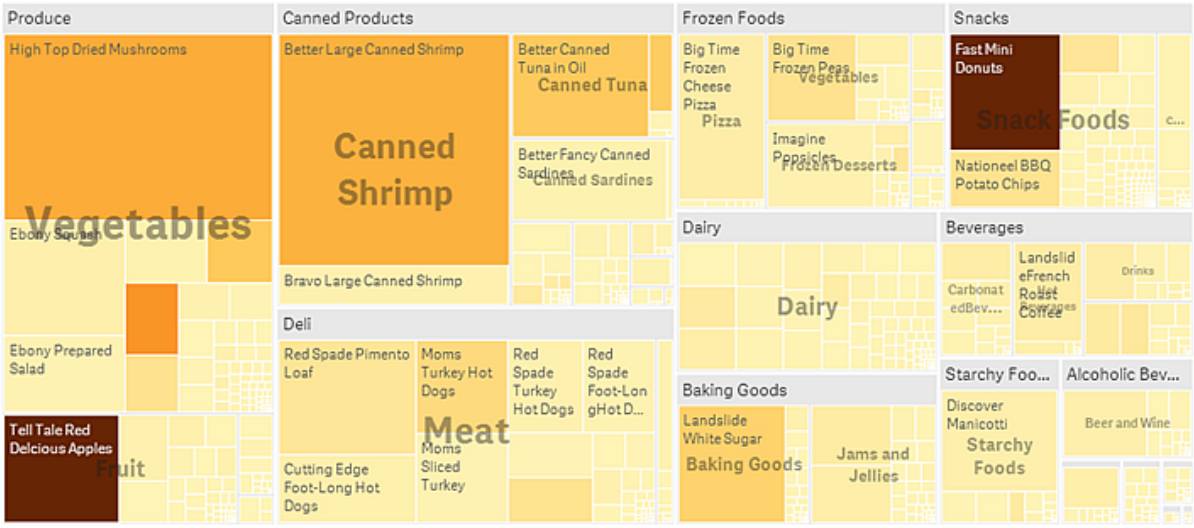
Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.

Presentation	In the list, set whether text and images should have a responsive behavior. When responsive behavior is selected, the size of text and images are adjusted to the size of the visualization area. However, they do not expand beyond their normal size.
Background image	**Use background image**: **Off** by default. Click the button to enable selection or removal of a background image. You can only have one background image at a time. **Image** Click to open the media library where you can select a background image. To remove the background image, click . **Sizing**: Set the sizing of the image. With the **Auto** setting, the image does not scale when the text & image visualization is resized. **Position**: Select the position of the image.

Treemap

Treemaps display hierarchical data by using nested rectangles, that is, smaller rectangles within a larger rectangle.



In this image you have several product groups, such as Produce, Canned Products, and Frozen Foods. Each product group consists of a large rectangle. You can regard the product groups as branches of the tree. When you select a product group, you drill down to the next level, the product type, for example, Vegetables, Meat, and Dairy. You can regard the product types as sub-branches of the tree. The branches have leaves. A leaf node's rectangle has an area proportional to a specified dimension of the data. In this example, the items Ebony Squash, Bravo Large Canned Shrimp, Red Spade Pimento Loaf, and so on, are the leaves. The leaf nodes are colored to show a separate dimension of the data.

Sorting is automatic according to size. By default, the coloring is by dimension, with 12 colors, but that can be changed in the properties panel. When you have more than one dimension, you can decide which dimension to color by. In this example, the coloring is not by dimension, but by expression (*Avg(Margin)*), a calculated measure, and by using this expression, you can see which items have the highest average margin. The darker the color, the higher the average margin.

If the data set contains negative values, a text message is shown stating that the negative values cannot be displayed.

When to use it

Use a treemap when space is constrained and you have a large amount of hierarchical data that you need to get an overview of. Treemaps should primarily be used with values that can be aggregated.

Advantages	Disadvantages
Treemaps are economical in that they can be used within a limited space and yet display a large number of items simultaneously. When there is a correlation between color and size in the tree structure, you are able to see patterns that would be difficult to spot in other ways, for example, when a certain color is particularly relevant.	Treemaps are not good when there is a big difference in the magnitude of the measure values. Nor is a treemap the right choice when mixing absolute and relative values. Negative values cannot be displayed in treemaps.

Creating a treemap

You can create a treemap on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty treemap to the sheet.
2. Click **Add dimension** and select a dimension or a field. This should be the highest level in the hierarchy.
3. Click **Add measure** and select a measure or create a measure from a field.
4. Continue adding dimensions and fields according to the hierarchy of the data.

In a treemap you need at least one dimension and one measure, but to make full use of the treemap it is preferable to have two or three dimensions. You can only have one measure, but up to 15 dimensions. We do not recommend using more than three dimensions as the treemap may become unmanageable.

When you have created the treemap, you may want to adjust its appearance and other settings in the properties panel.

Display limitations

When displaying large amounts of data in a treemap , there may be cases when not each dimension value within a rectangle is displayed with correct color and size. These remaining values will instead be displayed as a gray, striped area. The size and total value of the rectangle will still be correct, but not all dimension values in the rectangle will be explicit.

To remove the gray areas, you can either make a selection or use dimension limits in the properties panel.

Treemap properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Include null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click *fx* to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click *fx* to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click *fx* to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When you have set a limitation for the number of dimension values displayed, you have an option to summarize the measure values for the remaining dimensions by selecting **Show others**. When selected, a gray colored value summarizes all the remaining values.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label.
Add	On the **Data** tab, under **Dimensions**, click **Add** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .

Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimals. In this example "." is used as a decimal separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Cannot be used with a box plot. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.
Add alternative	Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Sorting

The sorting is done automatically by measure size.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

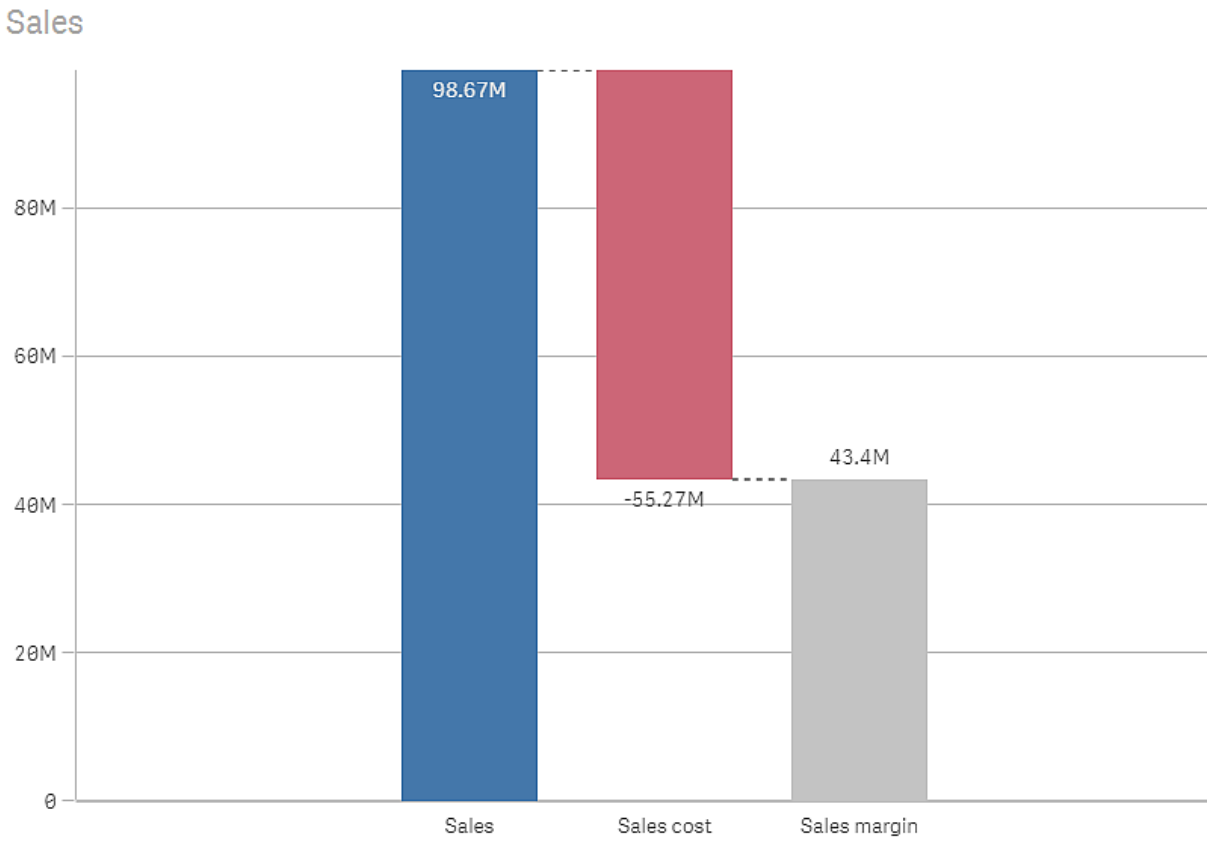
General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions. **Show details**: **Hide** by default. When set to **Show**, users can click ⓘ when analyzing to view details such as descriptions measures and dimensions.
Presentation	**Headers and labels** With the **Auto** setting, the display varies with the size of the treemap. Very small treemaps have no headers or leaf labels. Small treemaps have overlay labels and no leaf labels. Large treemaps have headers and (some) leaf labels. With the **Custom** option you can make settings for headers and leaf labels. **Headers**: When set to **Off**, you can either use **Overlay labels**, or no labels at all, by setting **Overlay labels** to **Off**. **Leaf labels**: With the **Auto** setting the leaf labels are displayed if there is enough space. **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space.
Colors and legend	**Colors**

	You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Use library colors**: Option when a master dimension or master measure used in the visualization has a color assigned to it. You can select to use the master item colors or to disable the master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. Only available with **Single color** and **Multicolored** settings. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **Dimension**: When set to **By dimension** and you have more than one dimension, you can select which dimension to color by. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. **Sequential classes**: The transition between the different color groups is made using distinctly different colors. **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map.

	Low and high values have dark colors, mid-range colors are light. **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors. **Reverse colors**: When selected, the color scheme is reversed. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Off**. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.

Waterfall chart

The waterfall chart is suitable for illustrating how an initial value is affected by intermediate positive and negative values. The starting and the final values are represented by whole bars, and intermediate values by floating bars. You can also show subtotals in the chart.



When to use it

The waterfall chart is suitable for illustrating how an initial value is affected by intermediate positive and negative values. One example of this is an income statement, when you want to show the positive and negative contributions of different accounts.

Advantages	Disadvantages
The waterfall chart provides a quick understanding of the transition of a value.	The waterfall chart is not relevant for detailed analysis of the data as you can't make selections in the chart or expand the data.

Creating a waterfall chart

You can create a waterfall chart on the sheet you are editing.

In a waterfall chart you need to use one measure for each bar in the chart. The order of the measures defines the order of the bars in the chart. For each measure, you need to define how it affects the previous value.

Do the following:

1. From the assets panel, drag an empty waterfall chart to the sheet.
2. Add the first measure.

This is the first bar of the chart. By default, it will use the measure operation **Add**, and show a positive value.

3. Add a second measure.
   This is the second bar of the chart. If you want to show this measure as a negative contribution, change **Measure operation** to **Subtract**.
4. Continue to add measures, setting **Measure operation** to **Add** or **Subtract** depending on how you want them to contribute.
5. Add subtotals. There are two ways of adding subtotal bars to the chart:
   - If you have a data field containing subtotal data, add a measure with the subtotal data and select **Subtotals** as **Measure operation**.
   - If you don't have a data field containing subtotal data, you can add an automatically calculated subtotal by selecting the **Subtotals** check box of the measure before where you want the subtotal bar.

When you have created the waterfall chart, you may want to adjust its appearance and other settings in the properties panel.

Defining your measures

You can use the **Measure operation** option of each measure to set how it affects the previous value.

- **Add**
  The measure value adds to the previous bar. If this is the first measure, a whole bar is shown starting at 0.
- **Subtract**
  The measure value subtracts from the previous bar.

  If the data already contains a negative sign, the result of subtraction will be a positive change.

- **Subtotals**
  The measure value is considered a subtotal.

  *If you do not have sub-totals as a field, you can add subtotals automatically by enabling **Subtotals** in the measure before you want the subtotal.*

In the waterfall chart shown above, the first bar, Sales, is defined as **Add**. The second bar, Sales cost, is defined as **Subtract**, and the third bar, Sales margin, is defined as **Subtotals**.

Waterfall chart properties

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add** to add a dimension or a measure.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.
Measure operation	Select how to use the measure in the chart: • **Add**: The measure value is added. • **Subtract**: The measure value is subtracted. • **Subtotals**: The measure value is treated as a subtotal value of the last measures using the same measure operation.
Subtotals	Select **Subtotals** to add an automatically calculated subtotal measure based on the result of all previous measure operations.
Subtotal label	Enter a label for the automatically calculated subtotal measure.

Add	On the **Data** tab, under **Measures**, click **Add** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add** is dimmed, you cannot add more measures.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Number formatting

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern. **Measure expression**: The format pattern is determined by the measure expression. Use this option to display custom number formatting for a measure in a visualization.
	Limitations: • Only works with visualizations that accept measures. • Does not affect the number formatting of the axis.

Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. The value may be entered as a calculated formula. For example: *count(distinct Team)<3*. If the condition is not fulfilled, the message or expression entered in **Displayed message** is displayed. A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Include zero values**: When unselected, measures that have the value ‘0’ are not included in the presentation. If there is more than one measure value, all the measure values must have the value ‘0’ to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

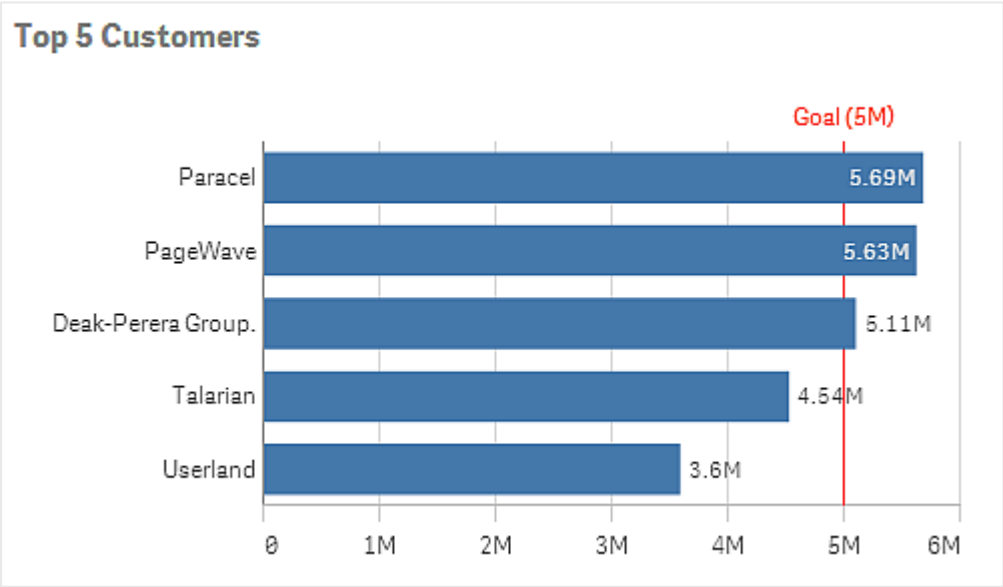
Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value. **Show details**: Set to **Show** if you want to allow users to be able to choose to view details, such as descriptions, measures, and dimensions.
Presentation	**Gridline spacing**: Set this to **Custom** if you want to customize the horizontal gridlines. You can choose between: • **No lines** • **Medium** • **Narrow** **Value labels**: Set this to **Off** if you want to hide value labels on bars.
Colors and legend	**Colors**: You can set the presentation color for the different measure operations: • **Positive value color** • **Negative value color** • **Subtotal color** **Legend**: Set to **Auto** to show a legend of the measure operations. You can set the position of the legend with **Legend position**: • **Auto**: The legend is automatically positioned where there is available space. • **Right**

	• **Bottom** • **Left** • **Top**
Y-axis:	**Labels**: Select if you want to show labels on the Y-axis. **Position**: Select where to display the dimension axis. **Scale**: Select how many lines you want to show on the Y-axis. **Narrow** shows many lines, and **Wide** shows few lines. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
X-axis:	**Labels**: Select if you want to show labels on the X-axis. **Label orientation**: Select orientation of the labels. **Position**: Select where to display the measure axis.

Reference lines

A reference line is a line intersecting the chart area from a given point on the measure axis. You can use a reference line to indicate a certain level of chart data. The reference line is only drawn if it falls within the current range of the measure axis. You can have several reference lines in the same chart.



Bar chart with a reference line at 5M

Reference lines are available in the following visualization types:

- Bar chart
- Box plot

- Distribution plot
- Gauge
- Histogram
- Line chart
- Scatter plot
- Waterfall chart

Reference line expression

You can either set the reference line expression to an absolute numeric value, or enter an arbitrary numeric expression.

Null values in visualizations

Data is sometimes missing or cannot be calculated, because the fields contain values that are null or not a number (NaN). In the visualizations, null and NaN values are displayed in different ways, according to the following table.

Visualization type	Null values in dimensions	NaN values in measures
Bar chart	–	– (when labels are enabled in the properties panel, otherwise empty)
Box plot	–	No representation
Combo chart	–	A combination of the NaN value for the bar and the line.
Distribution plot	–	No representation
Filter pane	No representation	N/A
Gauge	N/A	–
Histogram	–	No representation
KPI	N/A	–
Line chart	–	Empty
Map	No representation	Gray
Pie chart	–	Empty
Scatter plot	–	Empty
Table	–	–
Text & image	N/A	–
Treemap	–	Empty

4.7 Dimensions

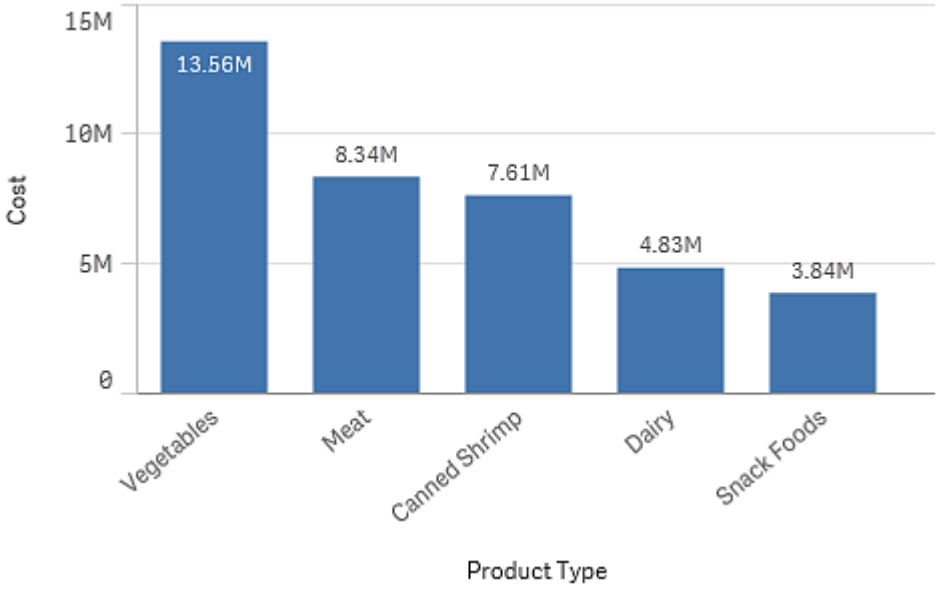
Dimensions determine how the data in a visualization is grouped - for example total sales per country or number of products per supplier. You typically find a dimension as the slices in a pie chart or on the x-axis of a bar chart with vertical bars.

Dimensions are created from fields in the data model tables.

Example:

Product Type is a field in the *Product* table that is loaded into the app. The values of this field are the different types that products are grouped into.

You can, for example, create a bar chart to visualize the cost of each type, by adding the *Product Type* dimension to the chart. To complete the visualization, you must add a measure (in this case Cost), which is grouped by the *Product Type* dimension.



Field groups as dimensions

One main difference between Qlik Sense and many other database viewers and online analytical processing tools (OLAP systems), is that in Qlik Sense, you do not need to predefine any hierarchies in the input data. The unique internal logic of Qlik Sense gives you the complete freedom to access any field as a full dimension in any order you like.

For most purposes, the built-in functionality is fully satisfactory, but in some situations, a predefined hierarchy can help you to display data more efficiently. In Qlik Sense, you can achieve this by defining hierarchic groups of fields as drill-down dimensions.

Any fields or calculated dimensions can be grouped together.

Drill-down groups

When several fields form a natural hierarchy, it can make sense to create a drill-down group.

Example 1:

Organization: Company, Department, Employee

Example 2:

Geography: Continent, Country, State, City

When you use a drill-down group as a dimension in a chart, the chart uses the first field in the group's list of fields that has more than one possible value. If the currently made selections cause the field to have only one possible value, the next field in the list is used instead, provided that it has more than one possible value. If no field in the list has more than one possible value, the last field is used anyway.

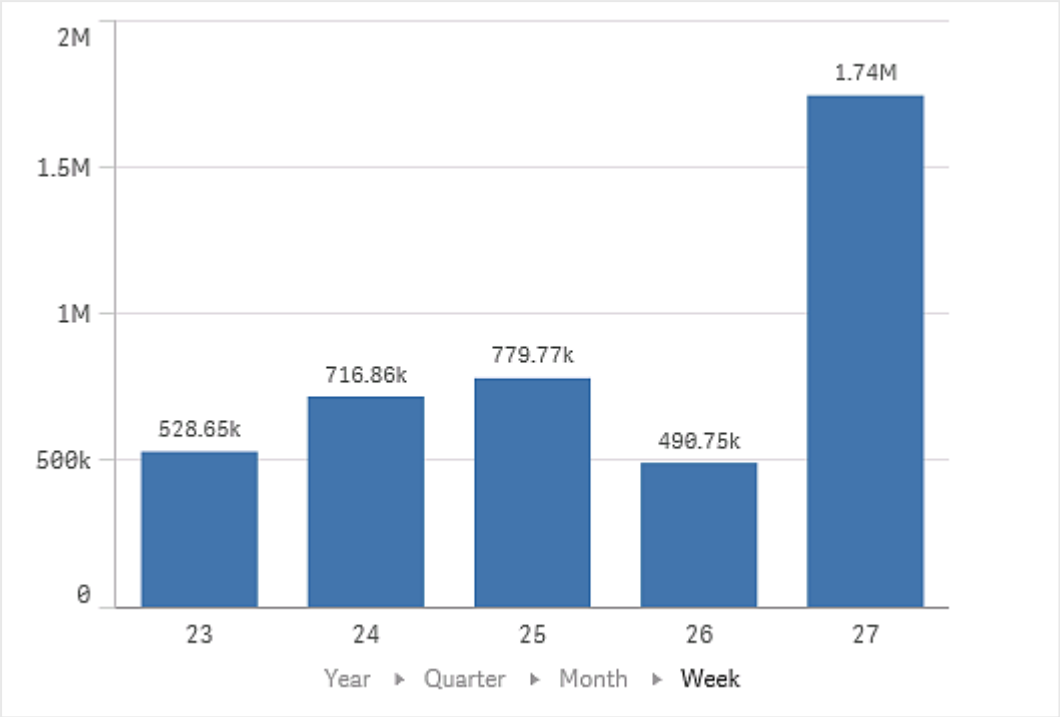
In the first example above, *Company* will be used as chart dimension until a single company is selected. The chart will then show *Department*. If a single department is selected, the chart will switch to *Employee*.

As selections are reverted, so that more than one value becomes possible in the upper fields of the group's field list, the chart is automatically drilled back up.

Drill-up

The drill-up function is available in bar charts, pie charts, and line charts. Other visualizations reflect the changes made in the charts, but cannot themselves be used to drill up through the different dimensions. When you drill down in a dimension group, breadcrumbs provide links back to the previous dimensions. Click the dimension that you want to drill up to.

In the following bar chart, the breadcrumbs *Year* > *Quarter* > *Month* enable drilling up.



Calculated dimensions

You can use expressions to create calculated dimensions. A calculated dimension consists of an expression involving one or more fields. All standard functions may be used.

> *For performance reasons, it is recommended to perform all calculations in the data load editor. When dimensions are calculated in the chart, Qlik Sense first calculates the dimension values, and then aggregates the measures for these calculated values, which affects the performance more than calculations in the load script.*

There are cases when calculated dimensions are powerful in data analysis, for example, if you want to generate the dimensions values during analysis, when dimension values are dependent on the selections.

Calculated dimensions are also useful if you want to modify a field.

Once you have created a calculated dimension, you can use it as any other dimension.

Example:

You have a field called Calendar Month that includes each of the months of the year. In your app, you want include a table that shows the sales for each of the first 6 months of the year. For the rest of the months, you want to see a total. You can use an expression to create this calculated dimension.

Syntax:

```
If ([Calendar Month] <7, [Calendar Month], 'Rest')
```

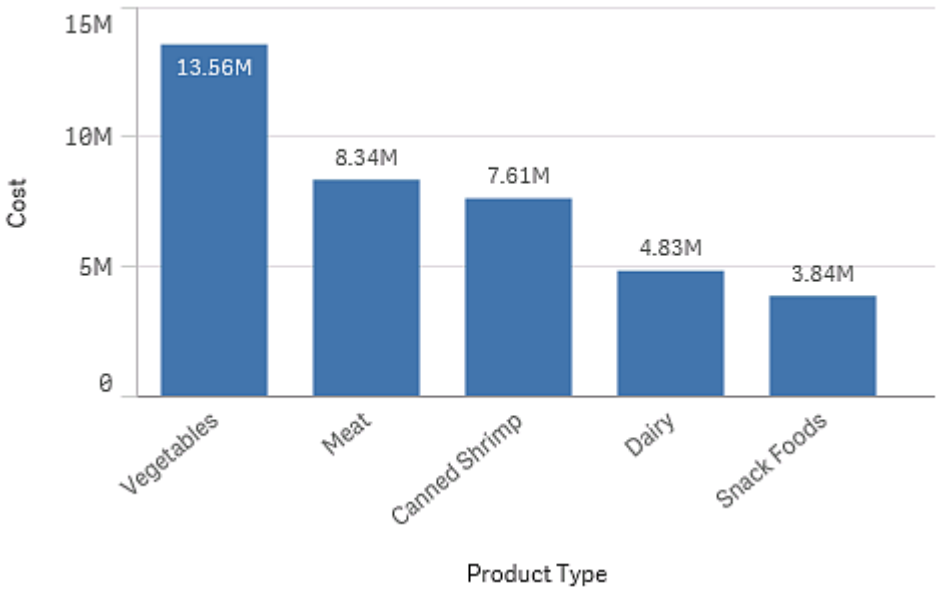
4.8 Measures

Measures are calculations used in visualizations, typically represented on the y-axis of a bar chart or a column in a table. Measures are created from an expression composed of aggregation functions, such as **Sum** or **Max**, combined with one or several fields.

A measure must have a name, and may also be supplied with descriptive data such as description and tags.

Example:

You can, for example, create a bar chart to visualize the cost of each type, by adding the *Product Type* dimension to the chart, and the measure *Cost*, which is made from the expression **Sum(Cost)**, that is the result of the calculation of the aggregation function **Sum** over the field **Cost**. The results are grouped by the *Product Type* dimension.



4.9 When to use what type of visualization

You use different charts and tables to present the data in a quick, understandable and meaningful way.

Charts present relationships among many values efficiently, and provide you with a way to analyze data at a glance. The best choice of chart type depends on the purpose of the visualization. For instance, tables are useful when you need to view precise values, and when you want to compare individual values to each other.

Here is a list of purposes for visualizing data and the chart type recommended to achieve that purpose.

Purpose of visualization	Recommended chart type

Compare data side by side	Bar chart
Combine absolute and relative values	Combo chart
Make selections to reduce data set	Filter pane
Indicate ratio	Gauge
Display a performance value	KPI
Display trends over time	Line chart
Display point and area data	Map
Display ratio to total	Pie chart
Create a cross table view of data and to summarize data	Pivot table
Display correlation of measures	Scatter plot
Display numbers and values	Table
Display text, images, links, and measures	Text & image
Display hierarchical data	Treemap
Compare range and distribution for groups of numerical data.	Box plot
	Distribution plot
Display distribution of numerical data over a continuous interval, or a certain time period.	Histogram
Display how an initial value is affected by intermediate positive and negative values.	Waterfall chart

What if no standard chart suits my purpose?

You can create custom visualization objects if none of the standard charts provided by Qlik Sense fits your requirement for visualizing your data.

See: *Creating a visualization using a custom object (page 215)*

4.10 Guidelines for visualizations, fields, and naming

There are certain conventions and limitations you need to be aware of when working with Qlik Sense. For example: the maximum number of characters to use in names, descriptions, and expressions, as well as characters reserved for use by Qlik Sense only.

Max number of visualizations

The maximum number of visualizations there can be on a sheet is limited to the number of cells on a sheet, that is, 288 (24x12). The maximum practical number will be less than this because of the limited use for visualizations that are made up of only 1 cell.

Upper limits on name lengths

The following limits apply to the number of characters that can be used in various situations in Qlik Sense:

Names (title, dimension, footnote...)	Max 255 characters
Descriptions	Max 512 characters
Expressions	Max 8,192 characters
Tags	Max 31 characters per tag and max 30 tags per master item
Text & image chart	Max 12,000 characters

Naming dimensions and measures

If you use long names for your dimensions and measures they will be truncated and not the whole name will be shown in the label properties panel, instead "…" will be shown at the end. It is also recommended to avoid using some characters reserved for system purposes, as unpredictable results and errors could occur.

Avoid using the following characters in dimension and measure names:

Colon	:
Equals sign	=
Left bracket	[
Right bracket	]
Left brace	{
Right brace	}
Dollar sign	$

Max number of characters in expressions

The maximum number of characters that can be written in a visualization expression is 8,192. If you attempt to build an expression with more than this number, the expression will be truncated.

Conventions for number and time formats

In many interpretation and formatting functions it is possible to set the format for numbers and dates by using a format code. This topic describes the conventions used to format a number, date, time or time stamp. These conventions apply both to script and chart functions.

Number formats

- To denote a specific number of digits, use the symbol "0" for each digit.
- To denote a possible digit to the left of the decimal point, use the symbol "#".

- To mark the position of the thousands separator or the decimal separator, use the applicable thousands separator and the decimal separator.

  The format code is used for defining the positions of the separators. It is not possible to set the separator in the format code. Use the **DecimalSep** and **ThousandSep** variables for this in the script.
  It is possible to use the thousand separator to group digits by any number of positions, for example, a format string of "0000-0000-0000" (thousand separator="-") could be used to display a twelve-digit part number as "0012-4567-8912".

  Examples:

# ##0	describes the number as an integer with a thousands separator. In this example " " is used as a thousands separator.
###0	describes the number as an integer without a thousands separator.
0000	describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123.
0.000	describes the number with three decimals. In this example "." is used as a decimal separator.

Special number formats

Qlik Sense can interpret and format numbers in any radix between 2 and 36 including binary, octal and hexadecimal. It can also handle roman formats.

Binary format	To indicate binary format the format code should start with (bin) or (BIN).
Octal format	To indicate octal format the format code should start with (oct) or (OCT).
Hexadecimal format	To indicate hexadecimal format the format code should start with (hex) or (HEX). If the capitalized version is used A-F will be used for formatting (for example 14FA). The non-capitalized version will result in formatting with a-f (for example 14fa). Interpretation will work for both variants regardless of the capitalization of the format code.
Decimal format	The use of (dec) or (DEC) to indicate decimal format is permitted but unnecessary.
Custom radix format	To indicate a format in any radix between 2 and 36 the format code should start with (rxx) or (Rxx) where xx is the two-digit number denoting the radix to be used. If the capitalized R is used letters in radices above 10 will be capitalized when Qlik Sense is formatting (for example 14FA). The non-capitalized r will result in formatting with non-capital letters (for example 14fa). Interpretation will work for both variants regardless of the capitalization of the format code. Note that (r02) is the equivalent of (bin), (R16) is the equivalent of (HEX), and so on.

Roman format	To indicate roman numbers the format code should start with (rom) or (ROM). If the capitalized version is used capital letters will be used for formatting (for example MMXVI). The non-capitalized version will result in formatting with lower cap letters (mmxvi). Interpretation will work for both variants regardless of the capitalization of the format code. Roman numbers are generalized with minus sign for negative numbers and 0 for zero. Decimals are ignored with roman formatting.

Examples:

num(199, '(bin)')	returns	11000111
num(199, '(oct)')	returns	307
num(199, '(hex)')	returns	c7
num(199, '(HEX)')	returns	C7
num(199, '(r02)')	returns	11000111
num(199, '(r16)')	returns	c7
num(199, '(R16)')	returns	C7
num(199, '(R36)')	returns	5J
num(199, '(rom)')	returns	cxcix
num(199, '(ROM)')	returns	CXCIX

Dates

You can use the following symbols to format a date. Arbitrary separators can be used.

D	To describe the day, use the symbol "D" for each digit.
M	To describe the month number, use the symbol "M". • Use "M" or "MM" for one or two digits. • "MMM" denotes short month name in letters as defined by the operating system or by the override system variable **MonthNames** in the script. • "MMMM" denotes long month name in letters as defined by the operating system or by the override system variable **LongMonthNames** in the script.
Y	To describe the year, use the symbol "Y" for each digit.

W	To describe the weekday, use the symbol "W". • "W" will return the number of the day (for example 0 for Monday) as a single digit. • "WW" will return the number with two digits (e.g. 02 for Wednesday). • "WWW" will show the short version of the weekday name (for example Mon) as defined by the operating system or by the override system variable **DayNames** in the script. • "WWWW" will show the long version of the weekday name (for example Monday) as defined by the operating system or by the override system variable **LongDayNames** in the script.

Examples: (with 31st March 2013 as example date)

YY-MM-DD	describes the date as 13-03-31.
YYYY-MM-DD	describes the date as 2013-03-31.
YYYY-MMM-DD	describes the date as 2013-Mar-31.
DD MMMM YYYY	describes the date as 31 March 2013.
M/D/YY	describes the date as 3/31/13.
W YY-MM-DD	describes the date as 6 13-03-31.
WWW YY-MM-DD	describes the date as Sat 13-03-31.
WWWW YY-MM-DD	describes the date as Saturday 13-03-31.

Times

You can use the following symbols to format a time. Arbitrary separators can be used.

h	To describe the hours, use the symbol "h" for each digit.
m	To describe the minutes, use the symbol "m" for each digit.
s	To describe the seconds, use the symbol "s" for each digit.
f	To describe the fractions of a second, use the symbol "f" for each digit.
tt	To describe the time in AM/PM format, use the symbol "tt" after the time.

Examples: (with 18.30 as example time):

hh:mm	describes the time as 18:30
hh.mm.ss.ff	describes the time as 18.30.00.00
hh:mm:tt	describes the time as 06:30:pm

Time stamps

The same notation as that of dates and times above is used in time stamps.

Examples: (with 31th March 2013 18.30 as example time stamp):

YY-MM-DD hh:mm	describes the time stamp as 13-03-31 18:30
M/D/Y hh.mm.ss.ffff	describes the time stamp as 3/31/13 18.30.00.0000

Time-aware charts

Time-aware charts are visualizations that use a continuous scale to provide a complete and accurate view of time-based data. That is, when you enable continuous scaling on the x-axis in a chart with date fields, data points are separated from each other by a distance relative to their associated time. As well, the axis labels are evenly separated whether or not there is data for that point and the chart view is compressed to avoid scrolling.

Continuous scale is supported for line charts, bar charts, and combo charts.

A continuous scale is most commonly used with date fields such as:

- Second
- Minute
- Hour
- Week
- Month
- YearMonth
- Quarter
- YearQuarter
- Year
- Date
- Timestamp

Adding a continuous scale

Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Click the line chart that you want to edit.
3. In the properties panel, click the **Appearance** tab.
4. In the **X-axis** section, check **Use continuous scale**.
   The chart is compressed and the data points and labels are readjusted.

Making selections in a time-aware chart

When navigating a time-aware chart, you can zoom into a smaller time span to take snapshots of the data displayed and select data values. Selections made on a time axis using range selection select all data values (even those that are not visible). Selections made on the measure axis or using lasso selections only select visible values.

Designing visualizations with Direct Discovery

Designing visualizations from Direct Discovery fields requires some background knowledge about the nature of the field types that can be used.

Direct Discovery fields in visualizations

DIMENSION

- The Direct Discovery DIMENSION field type can be used in the same way as any other dimension.

MEASURE

- A Direct Discovery MEASURE must be aggregated with one of the common functions before it can be used in a visualization.
- A regular field that is dropped onto a sheet becomes a filter pane, but not a Direct Discovery MEASURE as it must be aggregated first.

DETAIL

The Direct Discovery DETAIL field type can only be used in tables, and not in combination with a measure.

When creating a table using a Direct Discovery DETAIL field, and the number of rows being retrieved exceeds a value defined in the load script (by default, 1000 rows), you may see a warning message and the table may appear to be invalid. To make the table work normally, try making selections in the app to reduce the data set.

4.11 Create a visualization

You use visualizations to present the data that is loaded into an app. You create visualizations, on sheets, from pre-defined charts or extensions and add dimensions and measures to make the visualizations complete.

There are various ways to create new visualizations, according to your preferences and depending on if the app is published or not.

When you have added the visualization to the sheet, you may want to adjust its appearance using the properties panel.

Fields

Fields hold the data that is used in Qlik Sense. Fields can be thought of as the data loaded from the load script. Fields contain one or more values, called field values, and at the basic level, correspond to columns in a database table, but can also exist in more than one table. Field values consists of numeric or alphanumeric data. When loaded from the load script, fields can be represented as a table visualization.

Example of data in a load script:

```
Temp:
LOAD * inline [
Customer Product UnitSales UnitPrice
Imagine Film 4 16
Imagine Film 10 15
Imagine Shutter 9 9
PhotoInc Shutter 5 10
PhotoInc Lens 2 20
PhotoInc Magnifier 4 25
Gallery Film 8 15
Gallery Lens 7 19
] (delimiter is ' ');
```

The fields represented in a data model table after having loaded the data:

The same fields as columns in a table visualization on a sheet:

Customer	Product	UnitPrice	UnitSales
Gallery	Film	15	8
Gallery	Lens	19	7
Imagine	Film	15	10
Imagine	Film	16	4
Imagine	Shutter	9	9
PhotoInc	Lens	20	2
PhotoInc	Magnifier	25	4
PhotoInc	Shutter	10	5

Date & time fields

If you are working with fields containing date or timestamp information in your app, you can define a number of related attributes of a date, for example, year or week, and use them in your visualization.

Creating date fields in **Data manager**

Date fields are created automatically for all data fields recognized as a date or a timestamp when you use **Add data** with data profiling enabled to build your data model in **Data manager**, or when you click **Load data** in **Data manager**.

> *Date fields created in **Data manager** are automatically added to autoCalendar.*

If the date or timestamp field is not recognized automatically, you can adjust the input format in the **Data manager** table editor. You can also set the display format to use in visualizations.

Which date & time fields are automatically recognized ?

Date & timestamp fields will be recognized automatically based on your system locale settings. Additionally, the following formats are recognized:

- M/D/YYYY h:mm
- D/M/YYYY h:mm TT
- M/D/YYYY
- D/MM/YYYY
- YYYYMMDD
- YYYYMMDDhhmmss
- YYYYMMDDhhmmss.fff
- YYYYMMDDhhmmssK
- YYYY-MM-DD
- YYYY-MM-DDThh:mm:ss
- YYYY-MM-DD-Thh:mm:ss.fff
- YYYY-MM-DD-Thh:mm:ssK

Format specifier	Description
YYYY	Year
M, MM	Month
D, DD	Day
hh	Hour
mm	Minute
ss	Second

Format specifier	Description
fff	Millisecond
TT	AM or PM
K	Timezone
T	Divider between date and time. T can not be replaced with another character.

Creating date & time fields in the data load script

If you use the data load editor to build your data model, you need to create a calendar template where you define which fields to derive in the data load script. The derived date & time fields will be generated when the script is run and data is reloaded.

Using date & time fields in your app

Date & time fields in visualizations

All date or timestamp fields in the assets panel **Fields** tab are marked with 12 , and you can expand them to use the generated date & time fields. You can use them in visualizations, just like any other data field.

Date & time fields in dimensions

You can also use date & time fields when you create a dimension. The date & time fields are listed under the field that they have been generated from.

Date & time fields in expressions

You can use date & time fields in all expressions, for example when you create a measure. The date & time fields are named according to:

[field name].autoCalendar.[date & time field].

- [field name] is the name of the data field that was used to generate date & time fields.
- [date & time field] is the date & time field you want to use, for example, Year.

Example:

```
Date.autoCalendar.Year
```

Date & time fields in calendar measures

Calendar measures use date & time fields created in autoCalendar. Each of these date & time fields is calculated by a set analysis expression that determines whether or not data falls within the time-to-date period, or if dates are within a defined relative position to the current date. These date & time fields are relative and return results based on the current date. You can use these fields independently of calendar measures.

Calendar field date & time fields are formatted as follows:

[field name].autoCalendar.[date & time field]={[value]}

- [field name] is the name of the date field used to generate date & time fields.
- [data & time field] is the name of the date & time field used, for example, InYTD.
- [value] is the value for the date & time field's set analysis expression and determines which dates are included.

Example:

```
Date.autoCalendar.YearsAgo={1}
```

The following are the available date & time fields with sample values:

InYTD

This date & time field determines whether or not dates are within the year-to-date range or outside the year-to-date range.

Example	Result
`Date.autoCalendar.InYTD={0}`	Returns all dates that fall in the year-to-date time range. For example, if the current date was the 54th day of the year, the dates within the first 54 days of every year in the date field would be included.
`Date.autoCalendar.InYTD={1}`	Returns all dates outside the year-to-date time range. For example, if the current date was the 54th day of the year, all the dates after the first 54 days of every year in the date field would be included.

YearsAgo

This date & time field determines whether or not dates are from a specific year relative to the current date.

Example	Result
`Date.autoCalendar.YearsAgo={0}`	Returns all dates from this year.
`Date.autoCalendar.YearsAgo={1}`	Returns all dates from last year.
`Date.autoCalendar.YearsAgo={8}`	Returns all dates from eight years ago.

InQTD

This date & time field determines whether or not dates are within the quarter-to-date range or outside the quarter-to-date range, relative to the current date.

Example	Result
`Date.autoCalendar.InQTD={0}`	Returns all dates from all quarters that are within the quarter-to-date range. For example, if the current date was the 14th day of Quarter 1, the first 14 days of every quarter in the date field would be included.
`Date.autoCalendar.InQTD={1}`	Returns all dates from all quarters that are outside the current quarter-to-date range. For example, if the current date was the 14th day of Quarter 1, all dates after the first 14 days of every quarter in the date field would be included.

QuartersAgo

This date & time field determines whether or not dates are from a specific quarter relative to the current date.

Example	Result
`Date.autoCalendar.QuartersAgo={0}`	Returns all dates from the current quarter.
`Date.autoCalendar.QuartersAgo={1}`	Returns all dates from the last quarter.
`Date.autoCalendar.QuartersAgo={8}`	Returns all dates from eight quarters ago.

QuarterRelNo

This date & time field determines whether or not dates are from a specific quarter relative to the current date.

Example	Result
`Date.autoCalendar.QuarterRelNo={0}`	Returns all dates from each instance of the current quarter. For example, if the current date was in Quarter 4, all dates from each Quarter 4 in the date field would be included.
`Date.autoCalendar.QuarterRelNo={3}`	Returns all dates from each instance of the quarter two quarters prior to the current quarter. For example, if the current date was in Quarter 4, all dates from each Quarter 1 in the date field would be included

InMTD

This date & time field determines whether or not dates are within the month-to-date range or outside the month-to-date range, relative to the current date.

Example	Result
`Date.autoCalendar.InMTD={0}`	Returns all dates from all months that are within the current month-to-date range. For example, if the date was November 15, 2016, dates from the first 15 days of every month in the date field would be included.
`Date.autoCalendar.InMTD={1}`	Returns all dates from all months that are outside the current month-to-date range. For example, if the date was November 15, 2016, dates after the first 15 days to the end of the month of every month in the date field would be included.

MonthsAgo

This date & time field determines whether or not dates are from a specific month relative to the current date.

Example	Result
`Date.autoCalendar.MonthAgo={0}`	Returns all dates from the current month.
`Date.autoCalendar.MonthAgo={1}`	Returns all dates from the last month.
`Date.autoCalendar.MonthAgo={8}`	Returns all dates from eight months ago.

MonthRelNo

This date & time field determines whether or not dates are from a specific month relative to the current date.

Example	Result
`Date.autoCalendar.MonthRelNo={0}`	Returns all dates from each instance of the current month. For example, if the current month was June, all dates in every instance of June in the date field would be included.

Example	Result
`Date.autoCalendar.MonthRelNo={1}`	Returns all dates from the each instance of the previous month. For example, if the current month was June, all dates in every instance of May in the date field would be included.

InWTD

This date & time field determines whether or not dates are within the week-to-date range or outside the week-to-date range, relative to the current date.

Example	Result
`Date.autoCalendar.InWTD={0}`	Returns all dates from all weeks that are within the current week-to-date range. For example, if the current date was the third day of a week, dates from the first three days of every week in the date field would be included.
`Date.autoCalendar.InWTD={1}`	Returns all dates from all months that are outside the current month-to-date range. For example, if the current date was the third day of a week, dates from the last four days of the every week in the date field would be included.

WeeksAgo

This date & time field determines whether or not dates are from a specific week relative to the current week.

Example	Result
`Date.autoCalendar.WeeksAgo={0}`	Returns all dates from the current week.
`Date.autoCalendar.WeeksAgo={8}`	Returns all dates from eight weeks ago.

WeekRelNo

This date & time field determines whether or not dates are from a specific week relative to the current date.

Example	Result
`Date.autoCalendar.WeekRelNo={0}`	Returns all dates from each instance of the current week. For example, if the current week was the second week of the year, dates from the second week of every year in the date field would be included.
`Date.autoCalendar.WeekRelNo={1}`	Returns all dates from each instance of the previous week. For example, if the current week was the second week of the year, dates from the first week of every year in the date field would be included.

Creating a visualization using master items

When you are working with an unpublished app, you can create and use master dimensions and measures.

When you are working with a published app, you cannot create master items, but you have access to any master dimensions and measures that were included in the app when it was published.

Adding a chart to a sheet

You start creating a visualization by dragging a chart onto a sheet.

Do the following:

1. Click **Edit** in the toolbar.
   You find charts in the panel that opens on the left-hand side.
2. Drag a chart onto a sheet.
   You can drop it in an empty location on the sheet, split the area of an existing visualization into two, or replace an existing visualization. You can also convert an existing visualization to another kind of visualization.

If you double-click a chart, it is added to the sheet immediately.

Adding a master dimension

You find the master dimensions in the left-hand panel when you are editing a sheet.

Do the following:

- Drag a dimension from the **Dimensions** category and drop it on the visualization.

The dimension is added to the visualization.

Adding a master measure

You find the master measures in the left-hand panel when you are editing a sheet.

Do the following:

- Drag a measure from the **Measures** category and drop it on the visualization.

The measure is added to the visualization.

You now have a complete visualization that you can start using while exploring the data in the app.

Adding a master measure to a combo chart

The procedure is slightly different when creating a combo chart.

Do the following:

1. Drag a measure from the **Measures** category and drop it onto the visualization.
2. Click **Add "<measure name>"**.
3. Select how to visualize the measure by clicking one of the following: **As bar**, **As line** or **As marker**.

The measure is added to the visualization.

Creating a visualization using a custom object

You can enhance your apps with custom-objects. Custom objects that are available are visualization extensions and widgets, and you find them in the assets panel under .

You build your own visualization extensions and widgets in the Dev Hub.
Dev Hub

Adding a custom object to the sheet

You start creating a visualization by dragging a visualization extension or a widget onto a sheet.

Do the following:

1. Click **Edit** in the toolbar.
2. Click in the panel on the left-hand side to expand custom objects.
3. Drag a visualization extension or a widget onto the sheet.
   You can drop it in an empty location on the sheet, split the area of an existing visualization into two, or replace an existing visualization.

   If you double-click a custom object, it is added to the sheet immediately.

4. Change the required settings for the custom object in the properties panel. The required settings are defined by the extension developer, this can be dimensions, measures, or other settings.

You now have a complete visualization that you can start using while exploring the data in the app.

Creating a visualization from fields

When you are editing a sheet in an unpublished app, you find charts and fields in the assets panel on the left-hand side. You can use fields to quickly add dimensions and measures to a visualization.

Adding a chart to a sheet

You start creating a visualization by dragging a chart onto a sheet.

Do the following:

1. Click **Edit** in the toolbar.
   You find charts in the panel that opens on the left-hand side.
2. Drag a chart onto a sheet.
   You can drop it in an empty location on the sheet, split the area of an existing visualization into two, or replace an existing visualization. You can also convert an existing visualization to another kind of visualization.

If you double-click a chart, it is added to the sheet immediately.

Adding a dimension from a field

You find all the fields in the data model on the **Fields** tab of the assets panel.

Do the following:

1. Click in the assets panel to open the **Fields** tab.
2. Drag a field onto the visualization.
3. Select to use the field as a dimension.

The field is added to the visualization as a dimension.

Adding a measure from a field

You can use fields to quickly add measures based on some common aggregation functions.

Do the following:

1. Click in the assets panel to open the **Fields** tab.
2. Drag a field onto the visualization.
3. Select to use the field as a measure.
4. Select one of the common aggregation functions to use in combination with the field to create an expression.

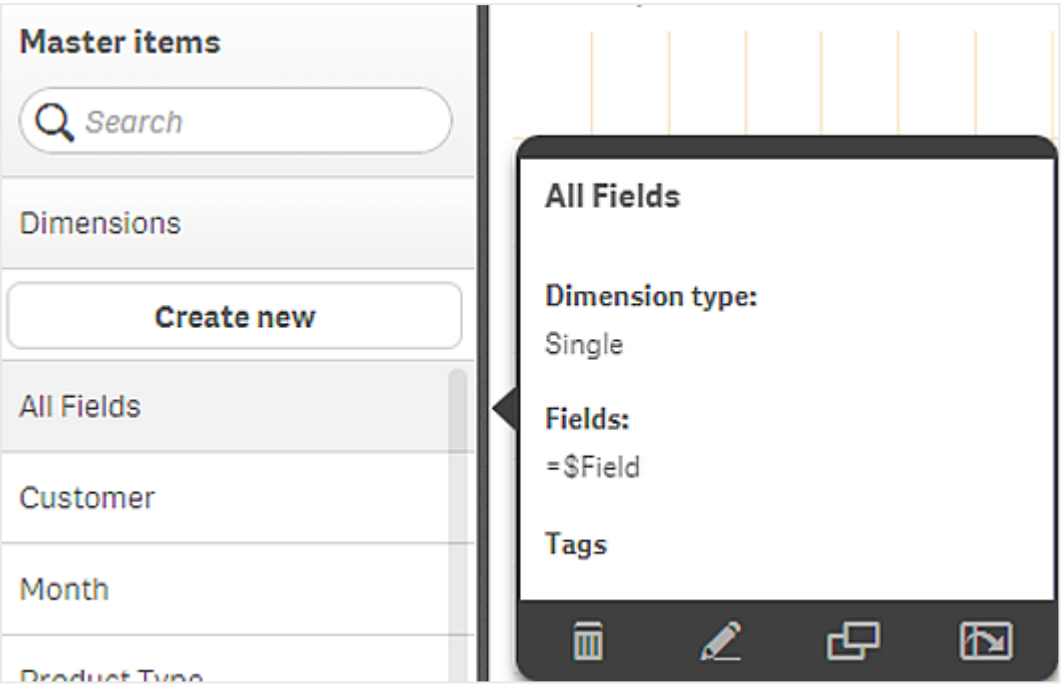
The expression is added to the visualization as a measure.

You now have a complete visualization that you can start using while exploring the data in the app.

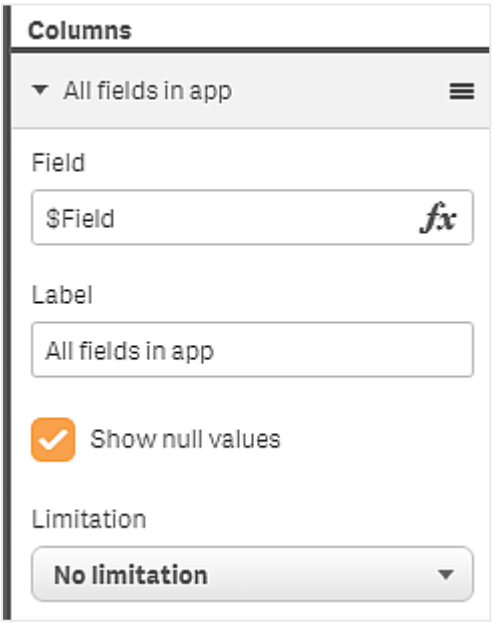
Using system fields in a visualization

You can use system fields in a visualization. System fields are created by Qlik Sense when the data load script is generated, and include information about the fields and tables in the loaded data. A system field begins with "$", and you need to reference it by typing the field name including the "$" manually. You can use

a system field to create a dimension either as a master item or from the properties panel.



Preview of a dimension based on a system field



A system field added as dimension in the properties panel

4.12 Editing a visualization

To make a visualization look its best and show the data in a way that is easy to understand, you can edit its properties in the properties panel. This could, for instance, be titles, descriptions, vertical or horizontal presentation and colors. It could also be how to sort the data (by measure, by dimension), which labels to show, and so on.

Do the following:

1. Click **Edit** in the toolbar.
   The properties panel for the sheet opens to the right. (If it is hidden, click in the lower right-hand corner.)
2. Click the visualization that you want to edit.
   The properties panel now shows the properties of the visualization.
3. Make your changes in the properties panel.
4. Click **Done** in the toolbar.

Change the appearance of a visualization

The **Appearance** section in the properties panel offers several options to set and modify the appearance of a visualization. Many of the settings have **Auto** options that support an optimal presentation of the visualization, taking into account the number of dimensions and measures and the type of data used. Normally, you do not need to change these settings, unless you have a special reason for doing so, for example, when space is very limited.

Appearance can be affected by the sorting of the dimensions and measures.

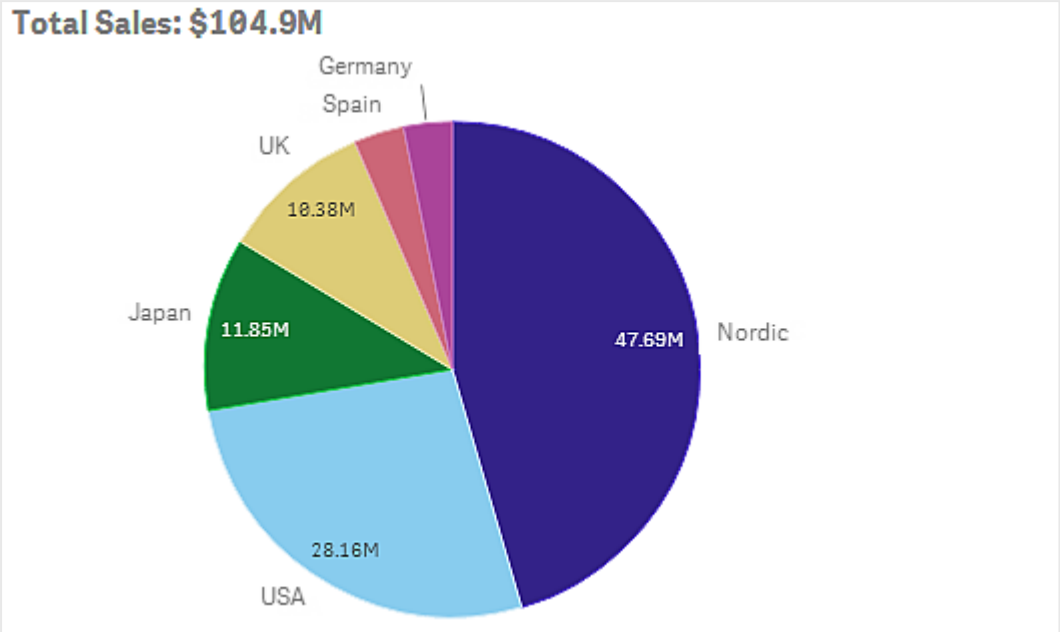
General

Show titles: **On** by default in all visualizations except filter panes and text & image visualizations. Filter panes have the name of each dimension, and in most cases do not need any additional title. The text & image visualization includes an editing toolbar with many options to format the text, and therefore the title field can be used for other purposes.

Title, **Subtitle**, and **Footnote**: Apart from the obvious use of title, subtitle, and footnote as text fields, you can use these fields to also display an expression, which provides additional information that complements the measure in the visualization. You could, for example, show the totals in the title field, so that the totals of the selected values are always available.

Example:

In the following image, the total sales are calculated and used in the title. When a selection is made, the total sales are updated accordingly.



The following string was used to add the *Total Sales* expression to the field **Title**:

='Total Sales: $'& Round(Sum(Sales)/1000000, 0.1) & 'M'.

Because the title field is primarily a text field, it is necessary to start the string with an equals sign (=), to signify that the strings contains an expression.

Because *'Total Sales: $'* is a text string when it is used in an expression, the string must be surrounded by single quotation marks.

& is used to concatenate the string and the expression.

Round(Sum(Sales)/1000000, 0.1) is the expression. The aggregation *Sum(Sales)* is divided by 1000000 and the function *Round (x,0.1)* reduces the number of decimals to one.

& 'M', finally, concatenates the expression with the unit *M* for million.

For the title there are three options for adding an expression:

- Directly in the title field of a visualization. Start the string with an equals sign (=).
- Directly in the box **Title** under **Appearance** in the properties panel. Start the string with an equals sign (=).
- Through the expression editor in the box **Title**. Click *fx* to open the expression editor. No equals sign is needed.

For the subtitle and footnote only the last two options are available.

Show details: **Hide** by default. When set to **Show**, users can click ℹ when analyzing to view details such as descriptions measures and dimensions.

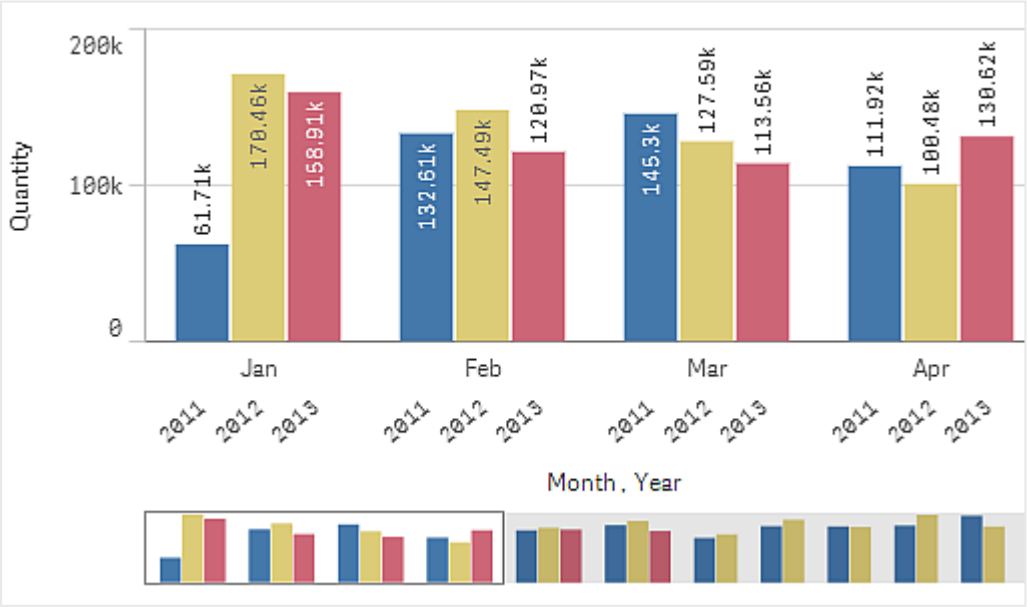
Presentation

Many of the presentation settings only apply to a certain visualization.

Bar chart	Set the bars to be displayed grouped or stacked, vertically or horizontally.
Box plot	Select to show whisker ticks and grid lines. You can show the visualization vertically or horizontally.
Distribution plot	Select to show point, background or both. You can show the visualization vertically or horizontally.
Gauge	Set the gauge to be displayed as a radial or a bar. You can set range limits and use segments with limits.
Histogram	Select to show grid lines.
Line chart	Set the line chart to be displayed as a line or an area.
Pie chart	Set the pie chart to be displayed as a pie or a donut.
Scatter plot	Turn on/off navigation. Set the size of the bubbles in a scatter plot. Set the compression resolution for large data sets in scatter plot.
Table	Set the totals to be displayed at the top, bottom, or not at all.
Treemap	Set the headers, labels, overlay labels, and leaf values. Select to show the data values.

Example:

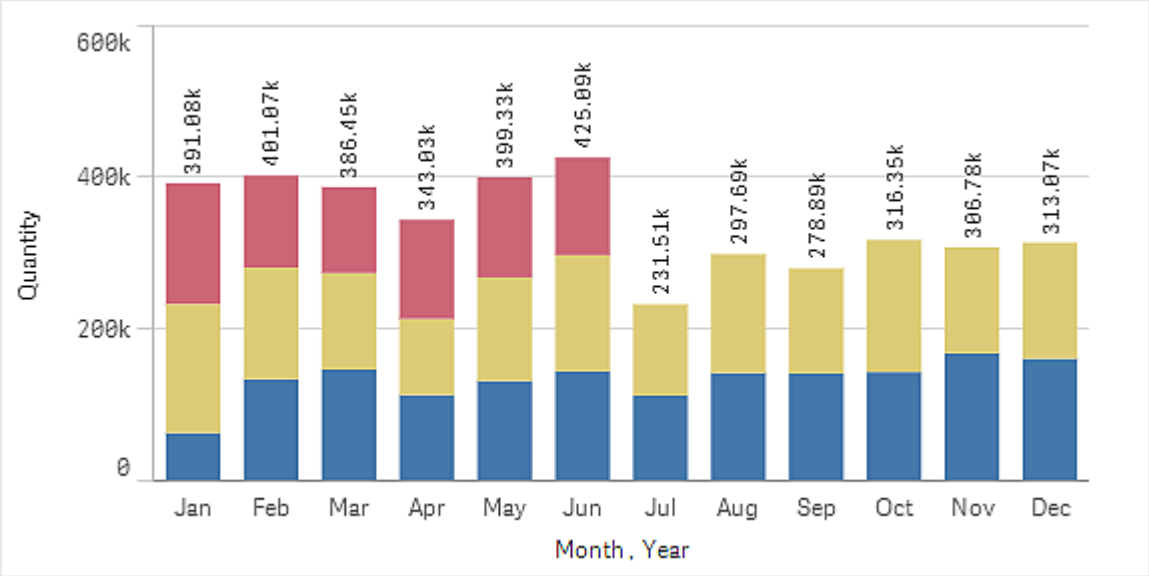
A bar chart with two dimensions is by default presented with the bars grouped.



Let us assume that you want to compare the total monthly quantity for these years. Then it would be a good idea to switch to a stacked bar chart.

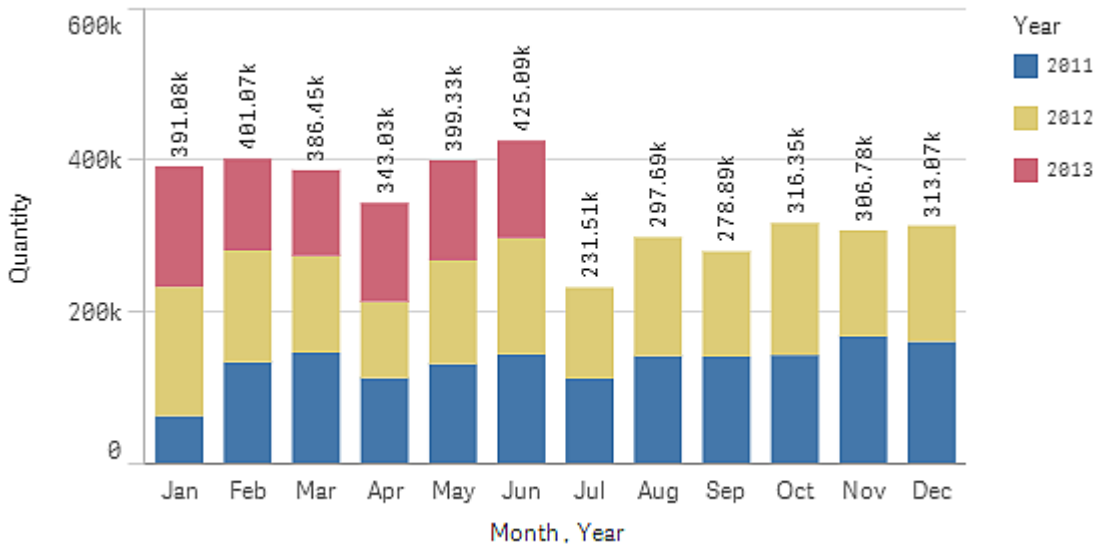
In the properties panel, under **Appearance** > **Presentation** there is an option **Stacked**.

With stacked bars it is easier to compare the quantity between different months.



Now it is quite easy to compare the quantities per month. There is a legend to display the years.

Under **Colors and legend**, **Show legend** is set to **Auto**, which means that the legend is displayed when there is enough space. In the properties panel, you can also set where to display the legend and whether to display the legend title.



There is only data for the first half of 2013 (red bars).

Colors and legend

The **Colors and legend** section of the properties panel sets your color and legend options. Qlik Sense automatically colors visualizations as they are added to your sheets. As a best practice, it is recommended to add or change colors only when it serves as purpose in the visualization. Too many colors or indistinct color choices can make visualizations less clear.

You can manually set the colors and legends by deselecting the **Auto** option and selecting your color preferences. Qlik Sense enables you to color your visualizations by:

- Single color
- Multiple colors
- Dimension
- Measure
- Master items
- Expression

For more information on different visualization coloring options, see: *Coloring a visualization (page 222)*. For examples of each of these methods of coloring visualizations and the settings used can be found, see *Examples of visualization color settings (page 234)*.

X-axis and Y-axis

For both the y-axis and the y-axis, you have options for deciding what combination of labels and title to display, as well as their orientation and position. Sometimes it may feel unnecessary to have labels and/or title, because the visualization is self-explanatory and then it would be good to be able to hide them. Furthermore, when you create a visualization that is very small, for example, three by three squares, the labels are automatically hidden.

Range: The measure axis (usually the y-axis) has an option to set the range of the axis. By default, the range is adjusted according to the highest positive or the lowest negative measure value, but if, for example, a single measure value is much larger than all the other values, you may want to set a range that is suitable for the lower values. In the properties panel, under **Appearance** > **Y-axis <measure name>**, there is a button for **Range**, which is set to **Auto**. Click the button to switch to **Custom**. Now you can set the range for **Max**, **Min**, or both. In a bar chart, the bars that are out of the range are cut diagonally to indicate that they are out range. In a line chart, only the parts that are within the range are visible.

Coloring a visualization

Qlik Sense automatically colors visualizations as they are added to your sheets. You can manually set the colors in your visualizations to meet your requirements or preferences. Color options for most visualizations are set in the properties panel, in **Appearance** > **Colors and legend**. By selecting **Custom**, you can manually apply colors to your visualizations using the following methods:

- Color by single color
- Color by multiple colors
- Color by dimension

Dimension fields can also be dragged and dropped from the assets panel onto a visualization to color the visualization by dimension (if supported by the visualization type).

- Color by measure
  Measure fields can also be dragged and dropped from the assets panel onto a visualization to color the visualization by measure (if supported by the visualization type).
- Color by expression

Tables and pivot tables can only be colored by expression. Options for coloring tables and pivot tables are found in the properties panel in **Data**.

If you want to keep colors consistent for dimensions or measures between different visualizations, you can assign specific colors to master items in your library. Most visualizations will use any colors assigned to master items automatically. In cases where a visualization uses both a master dimension and a master measure with assigned colors, the color assigned to the master dimension is used by default. You can select which master item color to use or disable master item colors entirely.

See: *Assigning colors to master items (page 287)*

You can also assign colors to individual master dimension values to ensure the colors of different values are consistent across visualizations.

See: *Assigning colors to master dimension values (page 290)*

To keep visualizations clear when you manually set colors, you should select colors for accessibility and only use different colors when they serve a purpose.

Color by single color

When you color by single color, one color is used for all objects in the chart. Coloring by a single color is best used for visualizations, such as bar or line charts, with a single dimension and measure.

If you have a master dimension or master measure that has a color assigned to it, you can color the visualization by that single color. In cases where a visualization uses both a master dimension and a master measure with assigned colors, the color assigned to the master dimension is used by default. You can select which master item color to use or disable master item colors entirely.

The following options are available when **Single color** is selected from **Colors** in **Appearance** > **Colors and legend**:

Use library colors	Select to use master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. This option is available when a master dimension or master measure used in the visualization has a color assigned to it.
Color	Select a color using the color picker. You can select a color from the default palette, enter a hex value for a color, or select a color from a color wheel.

Color by multiple colors

When you have multiple measures in a visualization, you can select **Multicolor** to color each measure with a different color. Qlik Sense offers a 12 color and a 100 color palette to apply to the visualization. By default, **12 colors** is selected as the color scheme dimensions.

If you are using master measures in your visualization, you can also choose to use them in your visualization. When a visualization is colored by master measures, master measures will use their assigned colors and any other measures are assigned colors from the **12 colors** scheme.

The following options are available when **Multicolor** is selected from **Colors** in **Appearance** > **Colors and legend**:

Use library colors	Select to use master item colors. In cases where a visualization has both a master dimension and a master measure that have colors assigned to them, you can select which to use in the visualization. This option is available when a master dimension or master measure used in the visualization has a color assigned to it.
Color scheme	Select the color scheme used in the visualization. The following schemes are available: • **12 colors**: The colors are reused when there are more than 12 values. The 12 colors in this color scheme can all be distinguished by people with a color vision deficiency. • **100 colors**: The colors are reused when there are more than 100 values. Not all of the 100 colors can be distinguished by people with a color vision deficiency.

Color by dimension

When you color a visualization by a dimension, all values in the visualization are colored by the corresponding values in the dimension field selected. By default, the visualization is colored by the primary dimension of the visualization, but you can select other dimensions. Qlik Sense offers a 12 color and a 100 color palette. By default, **12 colors** is set as the palette for color by dimensions.

If you are using a master dimension, you can color the visualization using the colors assigned to the distinct values of that dimension.

Coloring by dimension is useful when you want to keep track of related information in your visualizations, such as coloring multiple charts by the dimension of *Region* to clearly see the values related to each region in each chart.

The following options are available when **By dimension** is selected from **Colors** in **Appearance** > **Colors and legend**:

Select Dimension	Select the dimension used to color this visualization with this field. By default, if you have already selected a dimension for the visualization, it is set with that dimension. Click ▼ to select a different dimension. You can enter an expression by clicking *fx* to open the expression editor

Persistent colors	When selected, colors persist between selection states. If cleared, colors will be changed and reassigned for different dimension values as selections are made in the visualization.
Color scheme	Select the color scheme used in the visualization. The following schemes are available: • **12 colors**: The colors are reused when there are more than 12 values. The 12 colors in this color scheme can all be distinguished by people with color vision deficiency. • **100 colors**: The colors are reused when there are more than 100 values. Not all of the 100 colors can be distinguished by people with color vision deficiency.
Library colors	Select to use master dimension color values. This option is available when a master dimension is used in the visualization.

Color by measure

When you color a visualization by a measure, all values in the visualization are colored by a gradient or class based on the values in the selected measure. By default, the visualization is colored by the primary measure of the visualization, but you can select another measure. There are four available color schemes.

Coloring by measure is useful when you want to clearly see objects colored by their corresponding measure value.

The following options are available when **By measure** is selected from **Colors** in **Appearance** > **Colors and legend**:

Select Measure	Select the measure used to color this visualization. By default, if a measure has been added to the visualization, that measure is selected. Click ▼ to select a measure. You can enter an expression by clicking *fx* to open the expression editor
Color scheme	Select the color scheme used in the visualization. The following schemes are available: • **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. • **Sequential classes**: The transition between the different color groups is made using distinctly different colors. • **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. • **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.
Reverse colors	Select this option to switch which colors are used for low values and which colors are used for high values in the selected color scheme.

Range	Set the measure value ranges used to color the visualization. When set to **Auto**, Qlik Sense creates ranges based on the detected minimum and maximum values. When set to **Custom**, Qlik Sense automatically creates ranges based on user-defined minimum and maximum values. You must enter values or expressions that calculate those values in the fields **Min** and **Max**. You can enter an expression by clicking *fx* to open the expression editor

Color by expression

Coloring by expression applies colors to a visualization based on a user-defined expression. This enables you to use expressions to define both the colors used and the values upon which the colors are applied in a visualization. You could, for example, use an expression to set conditional colors in a chart.

The following options are available when **By expression** is selected from **Colors** in **Appearance** > **Colors and legend**:

Expression	Enter an expression by clicking *fx* to open the expression editor. See: *Color by expression (page 227)*
The expression is a color code	Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients.
Label	Enter the label to appear for the legend. **This expression is a color code** must be cleared.
Color scheme	Color scheme sets the colors used in the visualization. The following color schemes are available: • **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. • **Sequential classes**: The transition between the different color groups is made using distinctly different colors. • **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. • **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors. **This expression is a color code** must be cleared.

Reverse colors	When selected, the color scheme is reversed. **This expression is a color code** must be cleared.
Range	This setting sets the value ranges for coloring results in the visualization. • **Auto**: Qlik Sense creates ranges based on the detected minimum and maximum values. • **Custom**: Qlik Sense automatically creates ranges based on user-defined minimum and maximum values. You must enter values or expressions that calculate those values in the fields **Min** and **Max**. You can enter an expression by clicking *fx* to open the expression editor **This expression is a color code** must be cleared.

Color by expression in table visualizations

Expressions can be used to color table and pivot table backgrounds and text. This enables you to use expressions to define both the colors used and the conditional values upon which the colors are applied in a visualization. You could, for example, use expressions to change text and background colors depending on the values within different table cells.

The following options are available in **Data** for coloring table and pivot table visualizations:

Background color expression	Enter an expression by clicking *fx* to open the expression editor. The text color automatically changes to white when a dark background color is used. See: *Color by expression (page 227)*
Text color expression	Enter an expression by clicking *fx* to open the expression editor. If you use the same expression as in the background color, the text will not be visible. See: *Color by expression (page 227)*

Color by expression

Coloring by expression sets colors using a user-defined expression. When coloring by expression, you can define both what colors to use and which values to use them with, enabling more control over how colors are used in the visualization. For example, you might highlight values of particular interest, or differentiate between values within different value ranges. Coloring by expression can also be used to color a visualization by values not included within a visualization, such as coloring products and the sum of their monthly sales by the country of origin for the product.

When you select to color **By expression**, you can chose to either use the expression as a color code or to define how **By measure** color options are applied to the visualization using an expression.

The following visualizations support color by expression:

- Bar chart
- Combo chart

- Line chart
- Map
- Pie chart
- Pivot table
- Scatter plot
- Table
- Treemap

Legend selection is not available in a visualization when coloring by expression. Visualizations that are colored by expression with a color code do not support legends.

Coloring by expression as a color code

By default, if you choose to color by expression, **The expression is a color code** is enabled. If you have this option selected, your expression must include a color code in a supported expression format to define the colors to use. Using this method provides you with manual control over visualization colors as well as the conditions for the colors being used in a visualization. With tables and pivot tables, you can use expressions to define the background color and the text color of columns.

When coloring by expression, objects in visualizations are colored gray if the expression contains errors or if objects in the have multiple colors they could be assigned in the expression.

Examples

Here are a few examples to show what you can do with expressions by color.

Example: Coloring by random color range

*argb(255,rand()*255,rand()*255,rand()*255)*

This example uses ARGB color. It starts with alpha value that sets full opacity, and then uses the rand() function to generate random values for the red, green, and blue colors, creating a random color.

Example: Coloring by single measure value

if(sum([Budget Amount]) > 1000000, 'cornflowerblue', magenta())

In this example, there is a condition. If sum([Budget Amount]) is greater than 1 million, the corresponding measure values will be colored 'cornflowerblue', otherwise they will be colored magenta.

'cornflowerblue' is the color keyword for the color rgb(100, 149, 227).

magenta() is the Qlik Sense color function that generates a magenta color.

Example: Coloring by single measure value using an aggregated expression

if(avg(Value) > avg(Total aggr(avg(Value), Name)), Blue(), Brown())

In this example, there is a condition. If the *avg(Value)* value is greater than the aggregated *avg(Value)* value of the entire table, then the corresponding measure value is colored blue. If the *avg(Value)* value is less than the aggregated *avg(Value)* value of the entire table, then the corresponding measure value is colored brown.

Example: Coloring by multiple measure values

if(Sum(Sales) > 3000000, 'green', if(Sum(Sales) > 2000000, 'yellow', if(Sum(Sales) > 1000000, 'orange', red())))

In this example, there are multiple conditions. If Sum(Sales) is greater than 3,000,000, then corresponding measure values will be colored green. If Sum(Sales) is between 2,000,000 and 3,000,000, then the corresponding measure values will be colored yellow. If Sum(Sales) is between 1,000,000 and 2,000,000, the corresponding measure values will be colored orange. All other measure values will be colored red.

Example: Coloring by multiple dimensions

if([CompanyName]= 'A Corp', rgb(100, 149, 227), if([CompanyName]= 'B Corp', rgb(100, 149, 200), if ([CompanyName]= 'C Corp', rgb(100, 149, 175), if([CompanyName]= 'D Corp', rgb(100, 149, 150), 'grey'))))

In this example, the expression is used to define a RGB color for each specific dimension value in the field CompanyName.

Example: Coloring table object font and background by measure value.

if(Sum([Sales]) < 10000, 'red', green())

if(Sum([Sales]) > 200000, 'gold',)

In this example, two expressions are used to color the background and text of the *Sales* column. Measure values in *Sales* that are lower than $10000 have a red background color, all other values have a green background. In addition, the values that are higher than $200000 have the text color 'gold'.

Customer KPIs

Customer	Sales	Quantity	Margin (%)	# of Invoices
Totals	**$104,852,674.81**	**1,816,372**	**4127.8%**	**38314**
A-2-Z Solutions	$196,298.49	1,418	3841.7%	58
A-ARVIN Laser Resources	$4,053.05	25	3792.6%	13
A Superior System	$103,728.12	868	4074.5%	167
A&B	$92,120.60	891	4202.9%	18
A&G	$12,502.61	133	4708.0%	12
A&R Partners	$30,392.45	156	3409.9%	6
A1 Datacom Supply	$259,599.52	5,830	4025.7%	111
a2i	$451.64	14	5983.7%	9
A2Z Solutions	$69,977.36	454	4121.1%	94
AA-Wizard	$94,209.44	917	4660.6%	41
Aadast	$351,243.31	881	3707.3%	35
Aaron D. Meyer & Associates	$90,017.11	1,869	4404.1%	58

Coloring by expression without a color code

You can color by expression without a color by disabling **The expression is a color code** when you enable coloring by expression. In this method of coloring, the expression is used to evaluate to a numeric value that is plotted against a **By measure** chart gradient, treating the expression like a measure when coloring by measure.

> *When coloring by expression, objects in visualizations are colored gray if the expression contains errors or if objects in the have multiple colors they could be assigned in the expression.*

Example:

*100*Sum([Sales Margin Amount])/Sum([Sales Amount])*

In this example, charts would have **By measure** color gradients applied to them based on the profit margin percentile calculated in the expression.

Supported expression formats

The following formats are supported when you create your expressions.

RGB

With RGB colors you enter an integer value between 0 and 255 (or an expression that evaluates to such a value) for each of the colors red, green, and blue. The resulting color is produced by adding the three colors together.

Example:

rgb(0,0,255)

This example generates the color blue. Many of the RGB colors have a corresponding keyword in plain text that can be used instead of the RGB code. If you use *'blue'* as expression, you would get exactly the same color. Hexadecimal numbers are also supported, and the color blue has the string *'#0000ff'*.

ARGB

The ARGB color model has the same support as the RGB color model, but extends it with an additional alpha value to set the opacity of a color.

Example:

argb(125,0,0,255)

The first value (125), sets the alpha value. The value 0 generates full transparency and the value 255 full opacity.

HSL

In HSL, the color is defined by a hue value, a saturation value, and a luminosity value. You use values between 0 and 1. Hue is represented as an angle of the color circle (that is, the rainbow represented in a circle). Saturation is full with the value 1 and a shade of gray with the value 0. Lightness with the value 1 is white, and black with the value 0. The value 0.5 is commonly used.

Example:

hsl(0,0.5,0.5)

This example generates a red color with medium saturation and lightness.

Color keywords

Qlik Sense supports W3C recommended color keywords. With color keywords, specific colors are defined by a name which corresponds to a RGB hex value. Enter the color name in the expression to use the color.

Use the following links to find out more about W3C color keywords:

- http://www.w3.org/TR/CSS21/syndata.html#value-def-color
- https://developer.mozilla.org/en-US/docs/Web/CSS/color_value

Example:

'cornflowerblue'

This example generates a blue color with the hex value of #6495ed and a RGB value of (100, 149, 237).

Qlik Sense color functions

The following color functions can be used in expressions when coloring by expression.

- black()
- darkgray()
- lightgray()
- white()
- blue()
- lightblue()
- green()
- lightgreen()
- cyan()
- lightcyan()
- red()
- lightred()
- magenta()
- lightmagenta()
- brown()
- yellow()

Creating an expression

You create expressions for colors in the properties panel.

Do the following:

1. In the properties panel, open **Appearance** > **Colors and legend**.
2. Click the **Colors** button to switch to **Custom**.
3. In the drop-down list, select the option **By expression**.
   An expression text box is opened.
4. Enter your expression in the text box, or click *fx* to open the expression editor.

If the expression is valid, the visualization is updated.

Visualization support for coloring methods

Not all Qlik Sense visualizations support the same coloring options. Additionally, some visualization types have specific behaviors or limitations when using certain coloring methods. Color methods supported by

visualizations and their limitations are determined primarily by the kinds of data the visualizations displays. For example, visualizations that only support displaying measures cannot be colored by dimension or through using master dimensions.

Color method support by visualization

The following table outlines color method support by visualization type.

Visualization type	Color by						
	Single	Multicolor	Master measure	Master dimension	Dimension	Measure	Expression
Bar chart	✓	✓	✓	✓	✓	✓	✓
Box plot	✓						
Combo chart	✓	✓	✓	✓	✓	✓	✓
Distribution plot	✓						
Filter pane							
Gauge	✓	✓	✓				
Histogram	✓						
KPI	✓	✓					
Line chart	✓	✓	✓	✓	✓	✓	✓
Map	✓			✓	✓	✓	✓
Pie chart	✓	✓	✓	✓	✓	✓	✓
Pivot table							✓
Scatter plot	✓			✓	✓	✓	✓
Table							✓
Text & image							
Treemap	✓	✓	✓	✓	✓	✓	✓

Visualization coloring limitations and behaviors

Different visualizations have different behaviors with the methods of setting color in visualizations. This section outlines specific considerations when coloring different visualizations.

Line chart

Line charts do not support coloring by measure if they have two or more dimensions.

Map

Colors assigned to master dimensions that contain geopoint data or area data (polygons of geopoints) cannot be used to color a map.

Pie chart

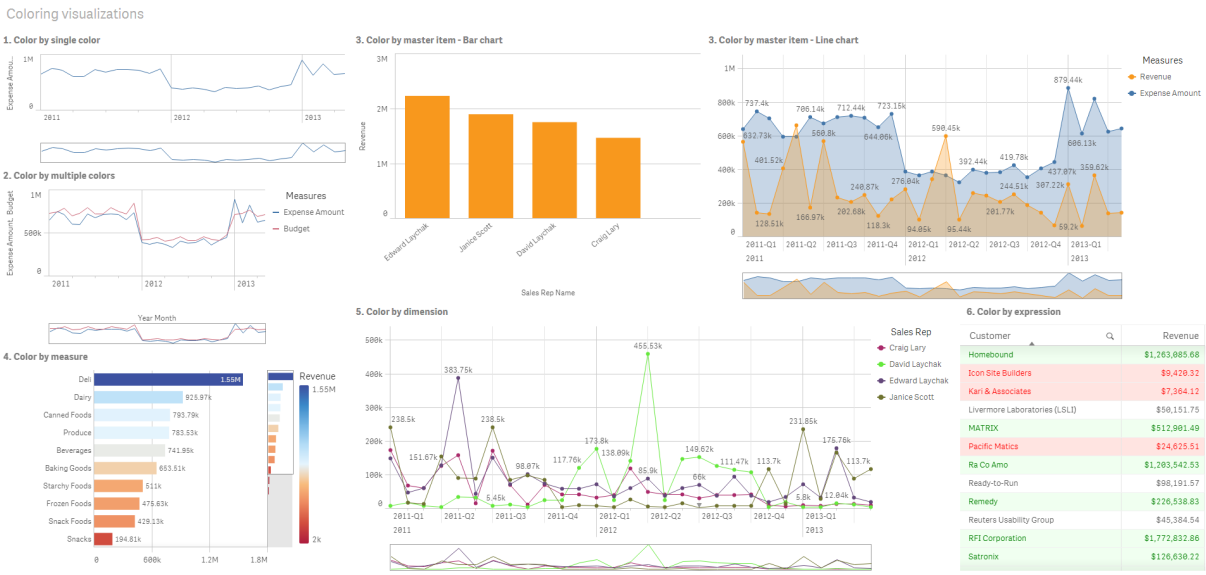
Pie charts do not use master item colors when **Auto** is selected under **Colors and legend**.

Examples of visualization color settings

Although Qlik Sense sets colors in visualizations automatically, you can use a number of different methods to control the use of colors in your visualizations. You can manually apply colors to your visualizations using the following methods:

- Color by single color
- Color by multiple colors
- Color by dimension
- Color by measure
- Color by expression

In the example dashboard below, each method of setting colors has a corresponding visualization. This section outlines each example as well as the specific settings used in the properties panel.

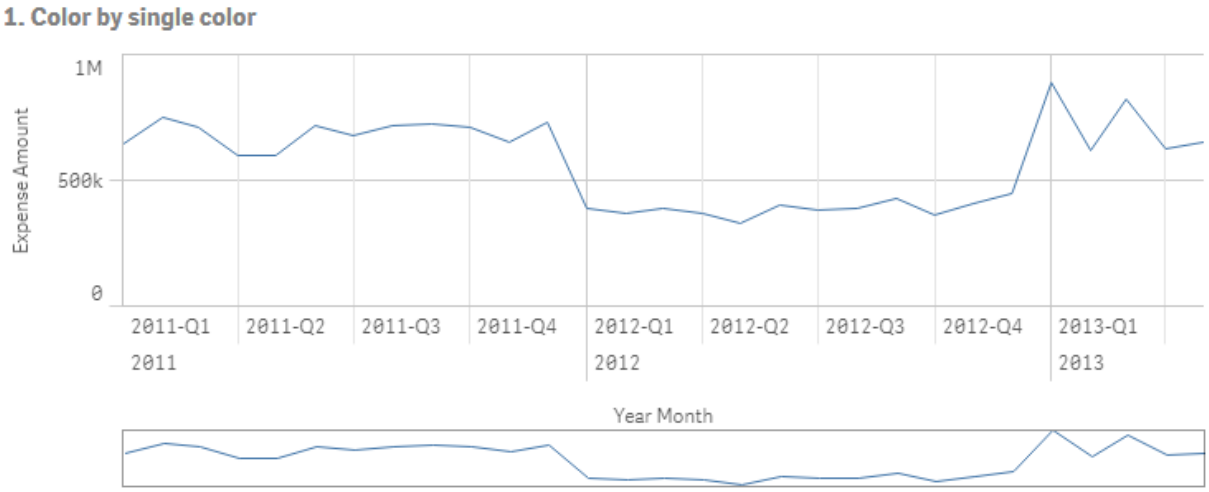


Example dashboard

Color by single color

Visualizations can be colored with a single user-defined color. Colors can be selected from a palette or color wheel or by entering a hex color code.

In this example visualization, a single color has been applied to the line chart.



Line chart colored by single color

Properties panel settings

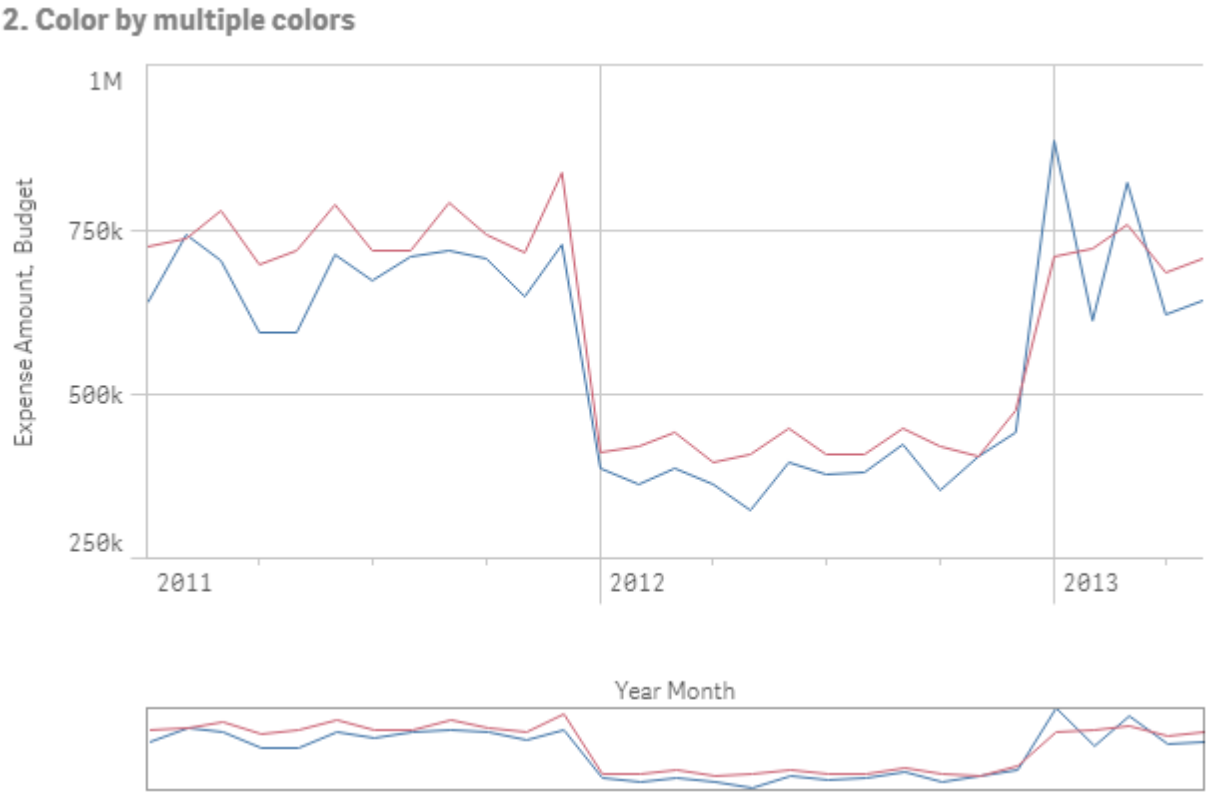
For this visualization, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

- **Colors**: Set to **Custom** and **Single color**. **Color** set as hex value *4477aa*.

Color by multiple colors

Visualizations with multiple measures can have different colors applied to each measure. When a visualization is colored using **Multicolor**, colors are automatically applied from a default color scheme of 12 colors or 100 colors.

In this example visualization, multiple colors have been applied to the measures of *Expense Amount* and *Budget* in the line chart.



Line chart colored by multiple colors

Properties panel settings

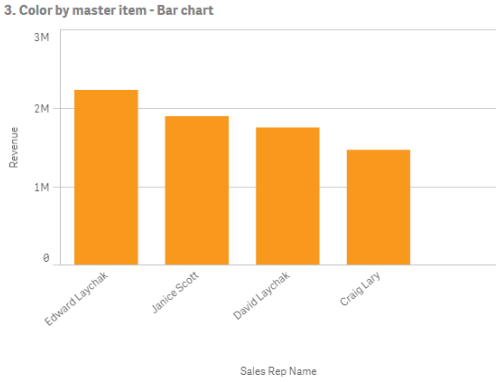
For this visualization, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

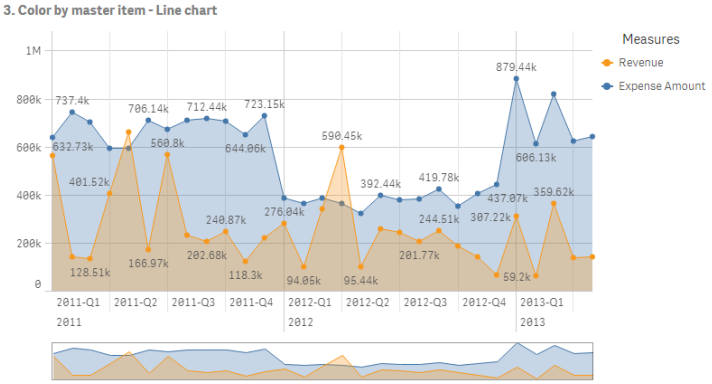
- **Colors**: Set to **Custom** and **Multicolored**.
- **Color scheme**: Set to **12 colors**.

Color by master item

Colors can be kept consistent across visualizations for dimensions or measures through setting colors in master items. When set to use master item colors, visualizations will use all colors associated to the master items in the visualization. Master item colors can be used when **Color** is set to **Single color** or **Multicolor**.

In these example visualizations, both the bar chart and line chart share a master measure, *Revenue*, that is colored orange. In each visualization, the same assigned color is used for each instance of *Revenue*. The line chart is colored by a second master measure, *Expense Amount*, which is colored blue.





Charts colored by master items

Master measure settings

For this visualization, the following settings were applied to the master measures in **Edit measure**:

- **Color**: Hex color set as *f8981d* for *Revenue* and *4477aa* for *Expense Amount*.

See: *Assigning colors to master items (page 287)*

Properties panel settings

For the bar chart, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

- **Colors**: Set to **Custom** and **Single color**.
- **Use library colors**: Set to enabled.

For the line chart, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

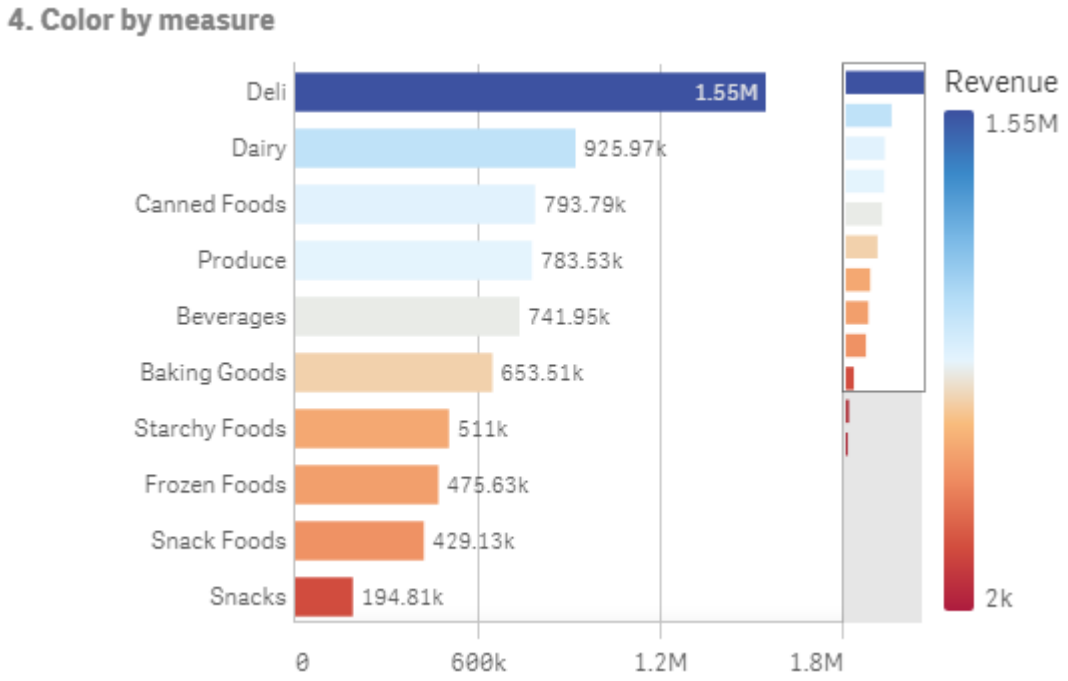
- **Colors**: Set to **Custom** and **Multicolor**.
- **Use library colors**: Set to enabled.

See: *Bar chart properties (page 34)* and *Line chart properties (page 105)*

Color by measure

When a visualization colored by measure, sequential or diverging gradients or classes are applied to values in the chart based on the values of the selected measure. Visualizations can be colored by measures within the visualization or they can be colored with measures associated to values in the visualization.

In this example, this bar chart is colored by the measure used in the visualization, *Revenue*. A diverging gradient has been applied to the values in the chart based on the *Revenue* value for each dimension value.



Bar chart colored by measure

Properties panel settings

For this visualization, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

- **Colors**: Set to **Custom** and **By measure**. The measure selected is *Revenue*.
- **Color scheme**: Set to **Diverging gradient**.
- **Reverse colors**: Set to enabled.
- **Range**: Set to **Auto**.

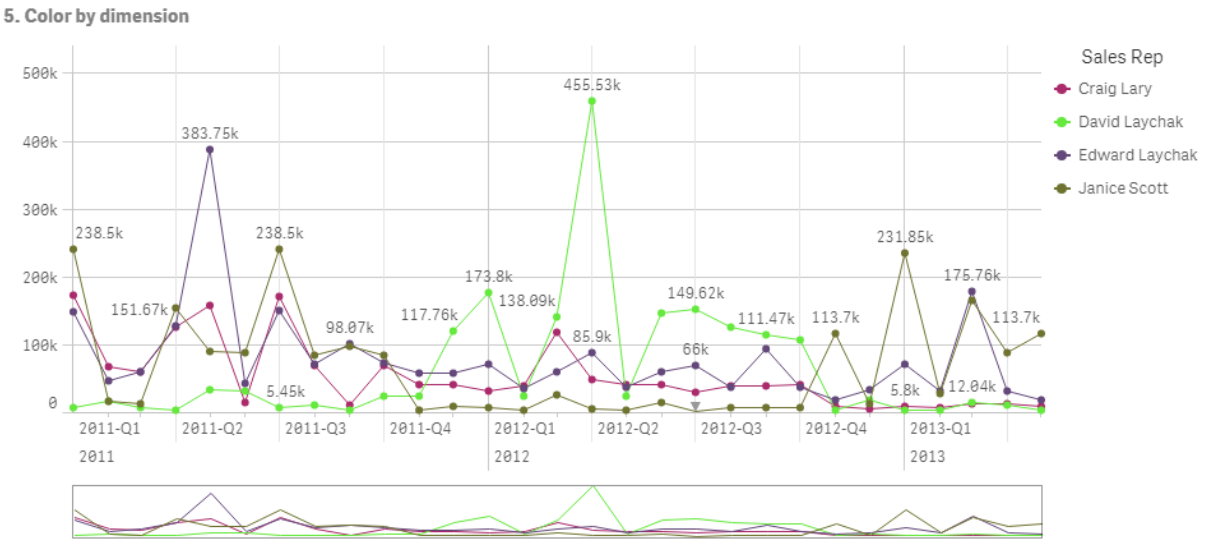
See: *Bar chart properties (page 34)*

Color by dimension

When a visualization is colored by dimension, each value within the visualization is assigned a color based on an associated value from the coloring dimension. When colored by dimension, colors are automatically applied from a default palette set of 12 or 100 colors.

Example 1: Coloring by a dimension in the visualization

In this example, the line chart is colored by the dimension of the different sales representatives, using the **100 colors** scheme. Each sales representative has their own distinct color in the visualization.



Line chart colored by dimension

Properties panel settings

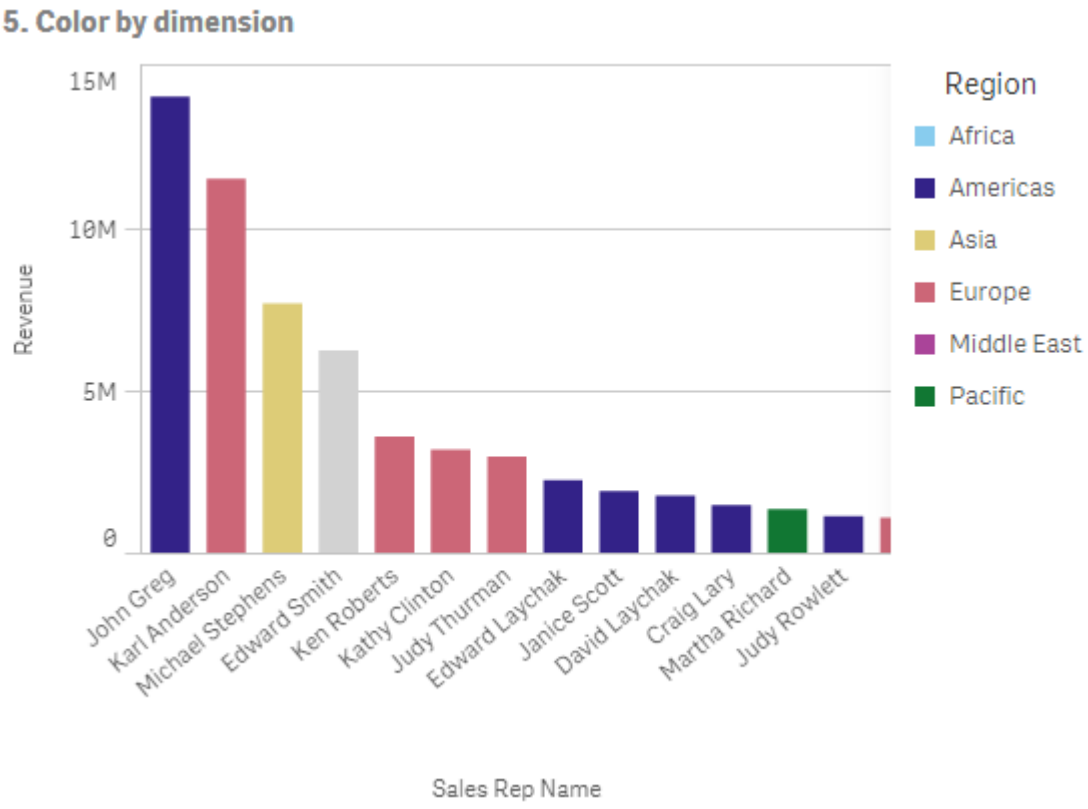
For this visualization, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

- **Colors**: Set to **Custom** and **By dimension**. The dimension *Sales Rep Name* is selected.
- **Persistent colors**: Set to enabled.
- **Color scheme**: Set to **100 colors**.

See: *Line chart properties (page 105)*

Example 2: Coloring by a dimension not included in the visualization

In this example, the bar chart is colored by the dimension of **Region**, using the **12 colors** scheme. The bar for each sales representative is colored by the region in which they work.



Bar chart colored by dimension

Properties panel settings

For this visualization, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

- **Colors**: Set to **Custom** and **By dimension**. The dimension *Region* is selected.
- **Persistent colors**: Set to enabled.
- **Color scheme**: Set to **12 colors**.

Color by expression

You can use expressions to set specific colors to appear with specific values, enabling conditional coloring of values in your visualizations. When a visualization is colored by expression, you define the colors and how the colors are applied to values within the expression.

Example 1: Color by expression in a table

In this example, the table visualization uses two expressions, one for the background color and one for the text. These expressions apply conditional colors to the background and text based on which rows contain the top 10 and bottom 10 values for *Revenue*.

6. Color by expression

Customer	Revenue
Homebound	$1,263,085.68
Icon Site Builders	$9,420.32
Kari & Associates	$7,364.12
Livermore Laboratories (LSLI)	$50,151.75
MATRIX	$512,901.49
Pacific Matics	$24,625.51
Ra Co Amo	$1,203,542.53
Ready-to-Run	$98,191.57
Remedy	$226,538.83
Reuters Usability Group	$45,384.54
RFI Corporation	$1,772,832.86
Satronix	$126,630.22

Table colored by expression

Properties panel settings

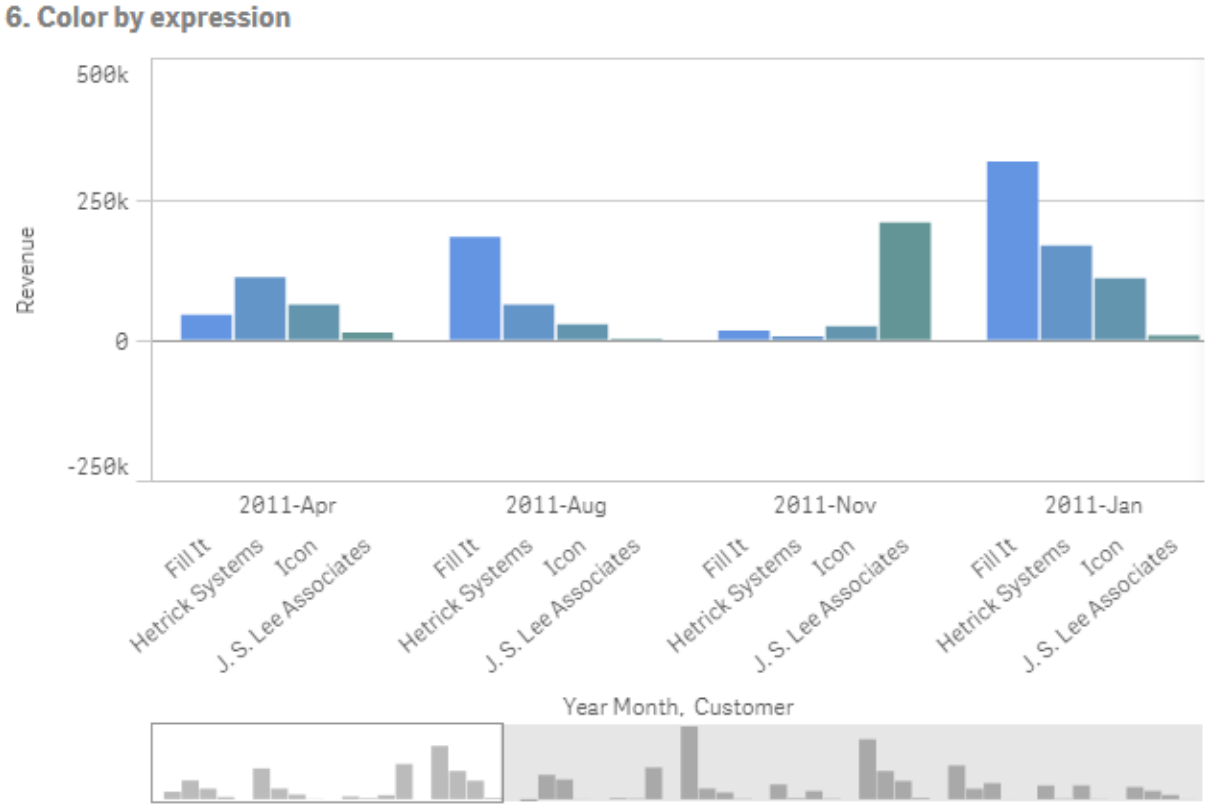
For this visualization, the following properties were set in the properties panel under **Data** > **Columns**:

- **Background color expression**: *if(Rank(Sum([Sales Quantity]*[Sales Price])) <= 10, 'honeydew', if(Rank(-Sum([Sales Quantity]*[Sales Price])) <= 10, 'mistyrose',))*
- **Text color expression**: *if(Rank(Sum([Sales Quantity]*[Sales Price])) <= 10, 'green', if(Rank(-Sum([Sales Quantity]*[Sales Price])) <= 10, 'red',))*

See: *Table properties (page 161)*

Example 2: Color by expression in a chart

In this example, the bar chart uses an expression to assign specific colors to different values in the *Customer* field.



Bar chart colored by expression

Properties panel settings

For this visualization, the following properties were set in the properties panel under **Appearance** > **Colors and Legends**:

- **Colors**: Set to **Custom** and **By expression**.
- **Expression**: Set to *if([Customer]= 'Fill It', rgb(100, 149, 227), if([Customer]= 'Hetrick Systems', rgb(100, 149, 200), if([Customer]= 'Icon', rgb(100, 149, 175), if([Customer]= 'J. S. Lee Associates', rgb(100, 149, 150), 'grey'))))*.
- **This expression is a color code**: Set to enabled.

Change the data of a visualization

In most visualizations, dimensions and measures are essential parts. The dimensions and measures define what the visualizations display, and by adding more than one dimension or measure you can compare or group data in different ways.

It is also possible to add alternative dimensions and measures through the property panel while editing the visualization. Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. After a dimension or measure has been added as alternative, they can easily be accessed and used through the visual exploration menu during analysis.

Adding dimensions

In the properties panel, under **Data**, you can add a dimension. In the **Dimensions** section, click **Add** to add a dimension, or **Add alternative** to add an alternative dimension. This opens a list of available **Dimensions** and **Fields**. The dimensions are those that exist as master items and the fields are those that have been loaded into the app.

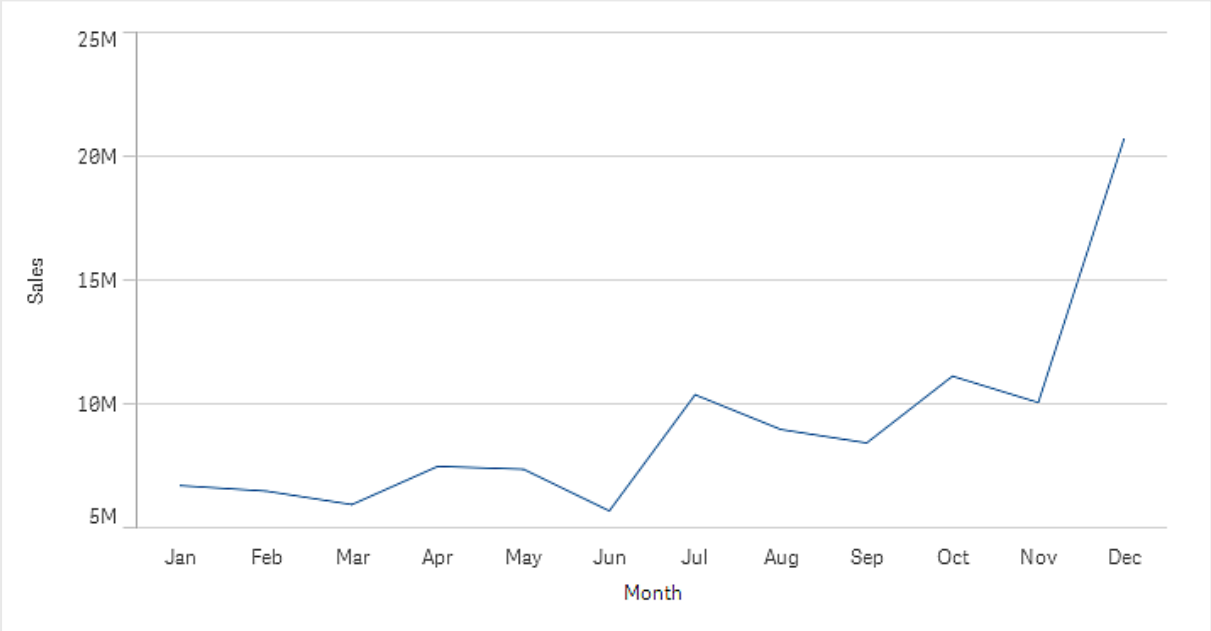
For example, if you create a dimension by clicking **Add** and typing *Month*. You select the field *Month* from the list to create a new dimension. You can edit the dimension after it has been created.

Adding measures

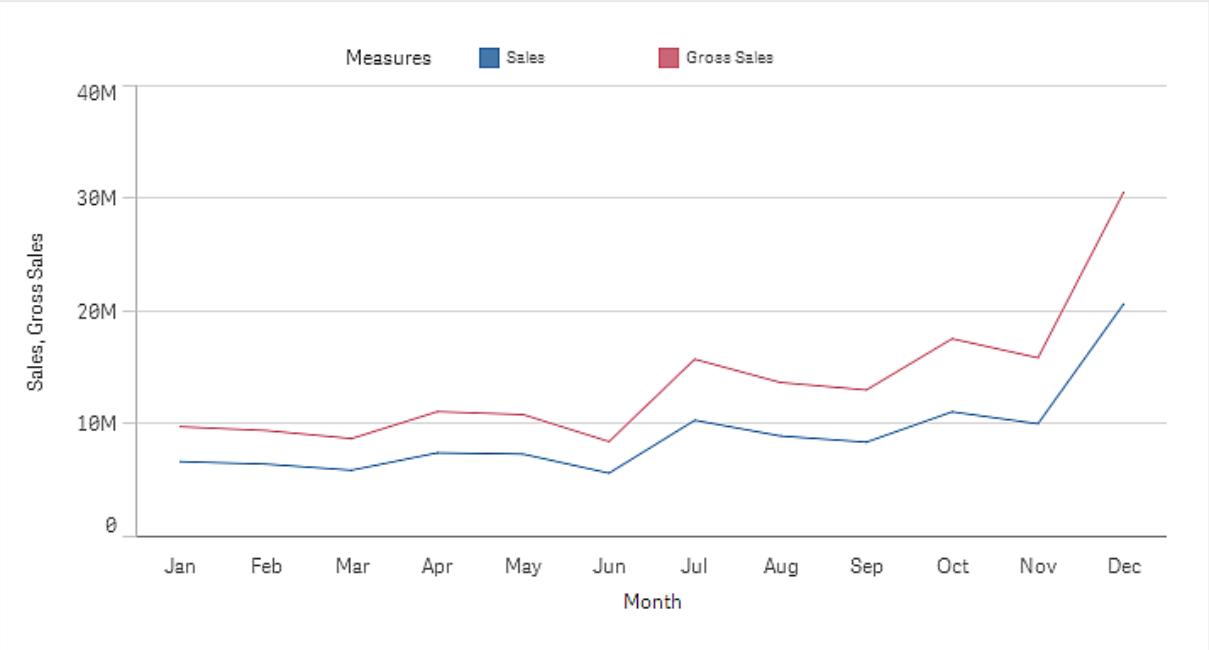
In the properties panel, under **Data**, you can add a measure. In the **Measures** section, click **Add** to add a measure, or **Add alternative** to add an alternative measure. This opens a list of available **Measures** (if any).

Let us assume that you create a measure by clicking **Add** and typing *Sum(Sales)* to create a new measure that calculates the sum of sales. You can edit the measure after it has been created.

In the following line chart, a measure *Sales* and a dimension *Month* have been added.



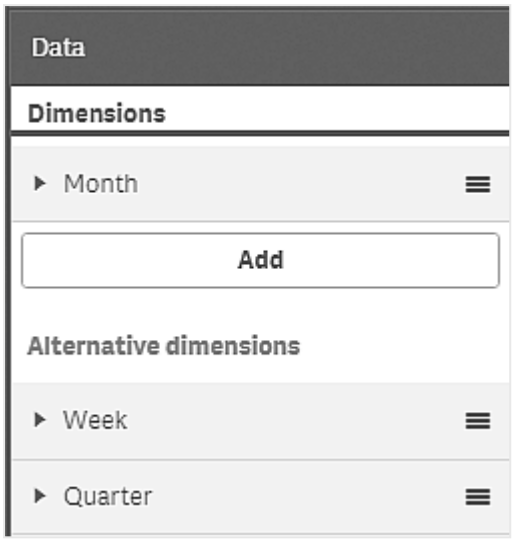
You can add a second measure, *Gross Sales*, to compare with *Sales*.



Line chart with the measures Sales and Gross Sales

Many visualizations have limitations on how many dimensions and measures that can be displayed at the same time. A line chart with two or more measures can only have one dimension, and a line chart with two dimensions can only have one measure. However, even if there are limitations on a visualization, you may sometimes have more dimensions or measures than those that are used in the visualization. This can happen when you have converted from one visualization to another, and some of the dimensions and measures are not used in the new visualization, or if you have added alternative dimensions and measures in the properties panel. The unused dimensions and measures are not displayed in the visualization, but they are visible in the properties panel under **Dimensions** and **Measures**, respectively.

In the following screenshot from the properties panel, there are three dimensions: *Month*, *Week*, and *Quarter*. The screenshot shows that the dimension *Month* is in use. If the visualization supports additional dimensions to be used, you can drag alternative dimensions from the **Alternative dimensions** section to the **Dimensions** section.



Properties panel for a chart with two unused (alternative) dimensions: Week and Quarter

Master items

Dimensions and measures that are linked to a master item are displayed with a in the properties panel. If you want to edit a linked dimension or measure, you have two options: either updating the master item in the assets panel, or unlinking the item and making the changes in the properties panel. An update of the master item is reflected in all linked items.

Even if linked items cannot be edited in the properties panel, you still have a few settings that can be edited. These are related to the presentation of the items.

A visualization that is linked to a master item is displayed with a on the sheet. You can edit a linked visualization, either by editing the master item or by unlinking the visualization. The unlinked visualization is independent of the master item and can be edited, but it can still contain dimensions or measures that are linked to master items.

Editing a dimension

You can edit dimensions in the properties panel. If you want to edit a master item, you must first unlink the dimension from the master item. In the properties panel, click the dimension that you want to edit.

Field: Start typing the field name to display a list of matching fields to choose from. You can also click *fx* to open the expression editor, where you can create a calculated dimension.

Label: Enter a name for the dimension.

Include null values: When this is checked, the visualization will include the null values of the dimension, presented as a gap or a dash, depending on the type of visualization. For example, if you have sales figures but do not have any information about what company the figures belong to, the figures will be added to the measure value for the null value dimension.

Limitation: You can limit the number of dimension values that are displayed.

Show others: When you have set a limitation for the number of dimension values displayed, you have an option to summarize the measure values for the remaining dimensions by selecting **Show others**.

Editing a measure

You can edit measures in the properties panel. If you want to edit a master item, you must first unlink the measure from the master item. In the properties panel, click the measure that you want to edit.

Expression: Enter the expression. You can also click *fx* to open and use the expression editor.

Label: Enter a name for the measure. The label is not automatically updated when you make changes in **Expression**.

Number formatting: Set the number formatting for the measure values. The options **Number** and **Date** offer custom formatting options for defining your own format pattern.

Invalid dimensions and measures

Dimensions and measures are invalid when the associated expression cannot be interpreted by Qlik Sense.

If you create an invalid dimension or edit an existing one so that it becomes invalid, the dimension is presented in the properties panel as dimmed with a red hue and the text **Invalid dimension** to indicate that the dimension is invalid. If you use an invalid dimension in a visualization, the visualization cannot be displayed.

If you create an invalid measure or edit an existing one so that it becomes invalid, the **Expression** text box under **Measures** in the properties panel is presented with a red border to indicate that the measure is invalid.

Deleting dimensions and measures

In the properties panel, you can delete a dimension or measure. Long-touch or right-click the dimension or measure and select **Delete** in the dialog. Alternatively, click the dimension or measure and click **Delete** . If you delete an instance of a master item, the master item is still available in the assets panel.

Adding a dimension

Adding dimensions to a visualization can be done from the properties panel.

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Adding a dimension from fields

Do the following:

1. In the properties panel, click the **Data** tab.
   The **Data** tab is expanded.
2. In the **Dimensions** section, click **Add** to add a dimension.
   A dialog with a text box opens. Below the text box all available dimensions are listed, grouped into **Dimensions** (that is master items) and **Fields**.
3. Start typing in the text box.
   A list of matching fields and dimensions is displayed.

   > *You can also create a dimension by entering an expression directly in the text box, or by clicking fx to create a dimension in the expression editor.*

4. Select the dimension that you want to use.

The dimension is added to the visualization. The new dimension settings are shown in the properties panel.

Adding a measure

Adding measures to a visualization can be done from the properties panel.

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

> *If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.*

Adding a measure from master items or fields

Do the following:

1. In the properties panel, click the **Data** tab.
   The **Data** tab is expanded.
2. In the **Measures** section, click **Add** to add a measure.
   A dialog with a text box opens. Below the text box all available measures are listed, grouped into **Measures** (master items) and **From a field**.
3. Start typing in the text box.
   A list of matching measures is displayed.

> *If no measure is displayed, you need to create one. You can enter an expression directly in the text box, or you can click fx to create a measure in the expression editor.*

4. Select the measure that you want to use.

The measure is added to the visualization. The new settings are shown in the properties panel.

Editing a measure from the properties panel

In the properties panel, you can modify a measure that is used in a visualization. A measure is either a master measure, or a standalone measure that is used only by an individual visualization. A master measure is indicated by the symbol in the properties panel.

Making a standalone measure from a master measure

Do the following:

1. When editing a sheet, click the visualization that you want to edit.
   The properties panel for that visualization is displayed on the right-hand side.
2. Under **Data**, locate and click the measure.
3. Click to unlink the measure.
4. Click **OK** to confirm.
   The measure is no longer linked to the master item.
5. In the expression box, click fx .
   The **Edit expression** dialog opens.
6. Make your changes and save the expression.

The measure is updated.

Editing a standalone measure

Do the following:

1. When editing a sheet, click the visualization that you want to edit.
   The properties panel for that visualization is displayed on the right-hand side.
2. Under **Data**, locate and click the measure.
3. In the expression box, click fx .
   The **Edit expression** dialog opens.
4. Make your changes and save the expression.

The measure is updated.

See also:

Create master measures (page 279)

Adding alternative dimensions and measures

Alternative dimensions and measures are dimensions and measures that are available, but not currently used in the visualization. Multiple alternative dimensions and measures can be added to the alternative section in the same way as dimensions and measures.

See: *Adding a dimension (page 246)* or *Adding a measure (page 247)*

You can change the active dimension or measures by dragging an alternative dimension or measure in the properties panel. During analysis, you can switch the dimension and measures in and out directly in the visualization by clicking the axis label.

> *You can add alternative dimensions and measure to all chart types but changing alternative dimension and measures in the visualization can only be done in bar, line and combo charts. Only alternative dimensions can be changed in the pie charts visualization and only alternative measures in scatter plots.*

You might want to add alternative dimensions and measures instead of creating a number of similar charts or to declutter an app.

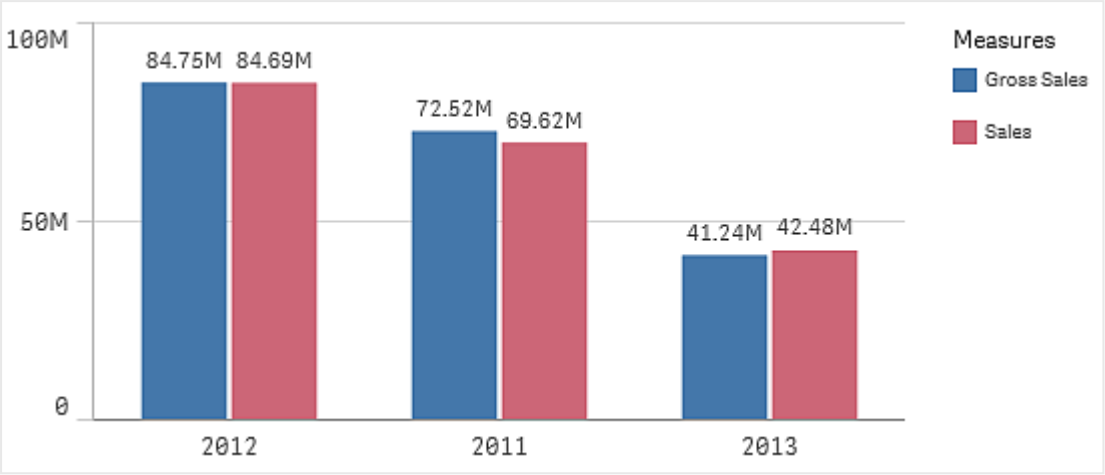
Change the sorting of a visualization

When you are working with a visualization, you will occasionally want to change the sorting order of the dimensions and measures so that your data is presented in the way you intend. Most visualizations have a **Sorting** section in the properties panel where you can put the cursor on the ☰ drag bars and drag the dimension or measure to rearrange the sorting order. In visualizations without a sorting section, you can still adjust the sorting to some extent.

In the following screenshot, the primary sorting is on the measure *Gross Sales*.

Sorting section in the properties panel

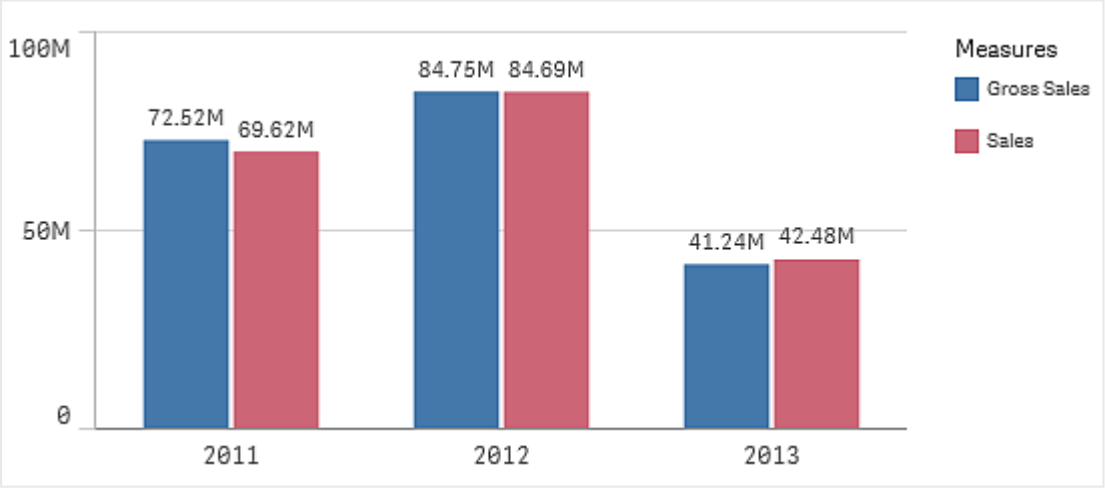
A bar chart with that sorting order will look as follows.



Bar chart sorted by Gross Sales

Since there are two measures, *Gross Sales* and *Sales*, the bars are by default grouped. *Gross Sales* is presented first, because it has sorting priority 1. If you were to drag *Sales* to the top of **Sorting**, the first bar would be *Sales* and the second bar *Gross Sales*.

To sort by *Year*, instead, you need to drag *Year* to the top in **Sorting**. The bar chart is then updated and sorted by *Year*.



Bar chart sorted by Year

In bar charts with multiple dimensions, sorting is locked to the first dimension. This dimension is what groups and stacks are based on, and sorting on a different dimension or a measure would break up these groups in an undesirable way. If you still want to sort by the measure value, try using the option ***Sort by expression*** *on the first dimension under* ***Sorting****.*

Sorting in the dimensions and measures sections

Although it is primarily under **Sorting** that you set the sorting order, you can also adjust the order in the properties panel section **Data** under **Dimensions** and **Measures**. In **Dimensions** you can change the priority order between the different dimensions by dragging them, and, likewise, in **Measures**, you can drag the measures to change the sorting order. Put the cursor on the ☰ drag bars and drag the dimension or measure to rearrange the order. Changes are reflected in the visualization.

Internal sorting

Apart from setting the sorting order between dimensions and measures, you can also set the internal sorting order, under **Sorting**.

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Additionally, you can sort by load order by switching to **Custom** and leaving all sorting options unselected.

If you have set a custom order for a field, that custom order will override any selected internal sort order in **Sorting**.

Default sorting

By default, the dimensions and measures are sorted in the order they were added, with the most recently added item last. Each dimension is sorted internally in the most common way for that type of data. Numbers are sorted numerically, ascending. Text is sorted alphabetically, ascending.

Bar chart	By default, a bar chart with one measure and one dimension is presented with vertical bars sorted descending on the measure. When a dimension has less than 10 values, the sorting is by dimension, alphabetically.
Box plot	By default, a box plot is sorted by the center line. You can also sort by first whisker, box start, box end or last whisker.
Combo chart	Sorted by the first item added, either the dimension or the measure.
Distribution plot	By default, a distribution plot is sorted by the outer dimension.
Filter pane	By default, data in filter panes is presented ascending.

Gauge	A gauge only uses a single measure value, the first one under **Measures**.
Histogram	The histogram does not have any sorting section.
KPI	By default, the first added measure becomes the main value.
Line chart	By default, a line chart is sorted by the dimension.
Map	A map can only have one dimension and one measure.
Pie chart	A pie chart uses one measure and one dimension. By default, a pie chart is sorted by the measure in descending order.
Scatter plot	The scatter plot does not have any sorting section, but the order of the measures decides where they are used. The first measure is used on the x-axis, the second measure is used on the y-axis, and the third (optional) measure is used for the bubble size (it is used to set the color on large data sets) in the scatter plot. You can only have one dimension in a scatter plot.
Table	By default, the column presents the dimensions and measures in the order they were added. Sorting order of rows: By default, the table is sorted in ascending order by the first dimension or measure under **Sorting**. You can temporarily change the sorting by clicking the header of the row you want to sort on. One click - ascending order, two clicks - descending order.
Text & image	The text & image visualization does not have any sorting section, but you can drag the measure tokens in the visualization to change the order.
Treemap	The treemap does not have any sorting section. The sorting is automatically by measure size.

Unlinking from a master dimension

If you want to make changes to a dimension that is linked to a master dimension, you must first unlink it from the master dimension. The dimension in your visualization is then independent with no connection to the master dimension in the assets panel.

Unlinking from the properties panel

A linked dimension that is used in a visualization can be unlinked from the properties panel.

Do the following:

1. Click **Edit**.
   The properties panel opens on the right-hand side.
2. Select the visualization on the sheet.
   The properties for the selected visualization are displayed in the properties panel.
3. Under **Data**, locate and click the dimension.
   A linked dimension is indicated by the symbol .

4. Click .
   A dialog is displayed that you are about to unlink from a master dimension.
5. Click **OK**.

The dimension used in the visualization can now be edited and the changes will not affect any other dimensions.

> *You can only unlink from a single dimension, not to a drill-down dimension.*

Unlinking from a master measure

If you want to make changes to a measure that is linked to a master measure, you must first unlink it from the master measure. The measure in your visualization is then independent with no connection to the master measure in the assets panel.

Unlinking from the properties panel

A linked measure that is used in a visualization can be unlinked from the properties panel.

Do the following:

1. Click **Edit**.
   The properties panel opens on the right-hand side.
2. Select the visualization on the sheet.
   The properties for the selected visualization are displayed in the properties panel.
3. Under **Data**, locate and click the measure.
   A linked measure is indicated by the symbol .
4. Click .
   A dialog is displayed that you are about to unlink from a master measure.
5. Click **OK**.

The measure used in the visualization can now be edited and the changes will not affect any other measures.

Changing the title of a visualization

You can change the title of a visualization by editing it directly on the sheet. You change the title by clicking it and making your changes.

You need to be in sheet view to edit the title.

Do the following:

1. Click **Edit** in the toolbar.
2. Click the title that you want to edit.
   The cursor appears.

3. Enter a title.
4. Click outside the title area.

The title is changed.

> *The text **Click to add title** is only visible in while editing the sheet. By default, the visualizations do not have a title.*

4.13 Converting a visualization

You can convert from one visualization type to another by dragging a chart from the assets panel on the left-hand side onto the visualization that you want to convert.

All properties that the original visualization has are transferred to the new type. The new visualization uses the dimensions, measures, and settings that are applicable to that visualization type. If a visualization requires an additional primary dimension or measure, the first listed alternative dimension or measure is used by default. If no alternative dimensions or measures exist and one is required the new visualization, you will be prompted to add one.

All properties from the original visualization are saved, even if they are not available or visible in the new visualization. This means that properties can become available again if you decide to convert to yet another visualization type where those properties are used.

Do the following:

1. While editing a sheet, drag a new chart from the assets panel onto the visualization that you want to convert.
   The shortcut menu opens.
2. Select the conversion option.

The new visualization is displayed, using the data from the original visualization.

> *When you convert to a new visualization type, some of the settings from the original visualization may not be optimal for the new visualization, for example, the sorting order. Therefore, you may need to make some changes in the properties panel, so that the new visualization is displayed as you want.*

> *You cannot convert to or from a map or a text & image visualization, nor can you convert a master visualization.*

4.14 Copying a visualization

You can copy a visualization:

- Within the same sheet
- Between sheets in the same app
- Between sheets belonging to different apps.

For a copied visualization to work in a different app, the same dimensions and measures have to be a part of the target app as well.

Do the following:

1. While editing a sheet, click on the item you want to copy.
   The item is highlighted.
2. On the edit bar, click .
3. To insert the item on another sheet, navigate to the sheet via the sheet navigator.
4. Click to paste the item.

The copied item is added to the sheet.

Depending on what situation you are in, different things will happen when you paste the copied visualization on a sheet:

- *If a visualization is selected, then the selected visualization will be replaced.*
- *If no visualization is selected, then the pasted visualization will be placed in the largest empty space.*
- *If there is no empty space, then the largest visualization on the sheet will be split in half to make space for the pasted visualization.*

4.15 Moving a visualization

You can move a visualization on a sheet.

Do the following:

1. Click **Edit** in the toolbar.
2. Drag the visualization to where you want to move it.

If you drag a visualization to the center of another visualization, they will swap places. If you drag a visualization towards one of the sides of another visualization, they will resize and share the existing space.

4.16 Replacing a visualization

You can copy a visualization on a sheet and then replace a different visualization with the copied visualization. You can replace a visualization that is located on any sheet in any app.

Do the following:

1. Click **Edit**.
2. Long-touch/right-click the visualization you want to copy and select **Copy**.
3. Long-touch/right-click on the visualization you want to replace an select **Paste and replace**.

The visualization is replaced.

If you select a visualization, you can replace that visualization with a copied visualization by pressing Ctrl+V.

4.17 Resizing a visualization

You can resize a visualization on a sheet. You can only use the available space when resizing. Other visualizations are not moved or resized when you resize a visualization.

Do the following:

1. Click **Edit** in the toolbar.
2. Click the visualization that you want to resize.
3. Use the handles in the corners to resize the visualization.

The resize causes the visualization to use progressive disclosure.

Progressive disclosure means the following: If the size of a visualization (or a unlocked snapshot) is increased, its information is disclosed progressively. If the size of a visualization (or a unlocked snapshot) is decreased, its information is reduced, which allows you to focus on the essential information and avoid cluttering the visualization with too much information in too little space.

4.18 Showing a visualization in full screen

You can expand a visualization on a sheet to see the details.

Touch device interaction

Do the following:

1. Long-touch the visualization.
   The touch item menu is displayed.
2. Tap .

The visualization is displayed in full screen.

Close the full screen view and return to the sheet view by clicking .

Computer (mouse) interaction

By default the full screen icon is hidden.

Do the following:

1. Hover over the visualization that you want to expand.
2. Click at the top right of the visualization.

The visualization is displayed in full screen.

Close the full screen view and return to the sheet view by clicking .

4.19 Unlinking from a master visualization

If you want to make changes to a visualization that is linked to a master visualization, you must first unlink it from the master visualization. The visualization on your sheet is then independent with no connection to the master visualization in the assets panel.

Unlinking using

A linked visualization can be unlinked using that is located in the top right corner of a linked visualization.

Do the following:

1. Click **Edit**.
2. Click in the top right corner of a linked visualization on the sheet.
   A dialog is displayed that you are about to unlink from a master visualization.
3. Click **OK**.

The visualization on the sheet can now be edited and the changes will not affect any other visualizations.

Unlinking from the shortcut menu

A linked visualization can be unlinked from the shortcut menu.

Do the following:

1. Click **Edit**.
2. Long-touch/right-click a linked visualization on the sheet.
   The shortcut menu opens.
3. Select **Unlink visualization**.
   A dialog is displayed that you are about to unlink from a master visualization.
4. Click **OK**.

The visualization on the sheet can now be edited and the changes will not affect any other visualizations.

4.20 Deleting a visualization

You can delete a visualization from a sheet.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Long-touch/right-click the visualization.
   The shortcut menu opens.
3. Click **Delete**.

You can also delete a visualization by selecting it, and then clicking the wastebasket that is available when you are editing a sheet.

4.21 Showing details

In sheet view, you can choose to view details, such as descriptions, measures, and dimensions for visualizations. This option is only available if **Show details** is set to **Show** in the properties panel for the visualization.

Do the following:

1. In sheet view, hover over the visualization you want to view details for and click . Alternatively, long-touch/right-click the visualization and select **Show details** from the shortcut menu.
   Either way a dialog with the detailed information opens.

See also:

Change the appearance of a visualization (page 218)

5 Using expressions in visualizations

Visualizations in Qlik Sense are built from charts, which in turn, are built from dimensions and measures, depending on the type of chart. Visualizations can have titles, subtitles, footnotes, and other elements to help convey information. All of the elements that make up a visualization can be simple: a dimension consisting of a field representing data, a title consisting of text, for example.

For visualizations that contain measures, the measures are calculations based on fields, for example **Sum (Cost)**, which means all the values of the field **Cost** are aggregated using the function **Sum**. In other words, **Sum(Cost)** is an expression.

5.1 What is an expression?

An expression is a combination of functions, fields, and mathematical operators (+ * / =). Expressions are used to process data in the app in order to produce a result that can be seen in a visualization. They are not limited to use in measures. You can build visualizations that are more dynamic and powerful by using expressions for titles, subtitles, footnotes, and even dimensions.

This means, for example, that instead of the title of a visualization being static text, it can be made from an expression whose result changes depending on the selections made.

5.2 Where can I use expressions?

Expressions can be used in a visualization wherever the symbol *fx* is seen in the properties panel while editing a visualization. The *fx* symbol indicates an expression field. By clicking *fx* , you enter the expression editor, which is designed to help you build and edit expressions. Expressions can also be entered directly into the expression field, without using the expression editor.

An expression cannot be saved directly as a master item, but if an expression is used in a measure or dimension, which is then saved as a master item, with its descriptive data, such as name, description, and tags, the expression in the measure or dimension is preserved.

Expressions are used both in scripts and in chart visualizations. They can be simple, involving only basic calculations, or complex, involving functions fields and operators.Expressions can be used in several different situations. The difference between measures and expressions is that expressions have no name or descriptive data.

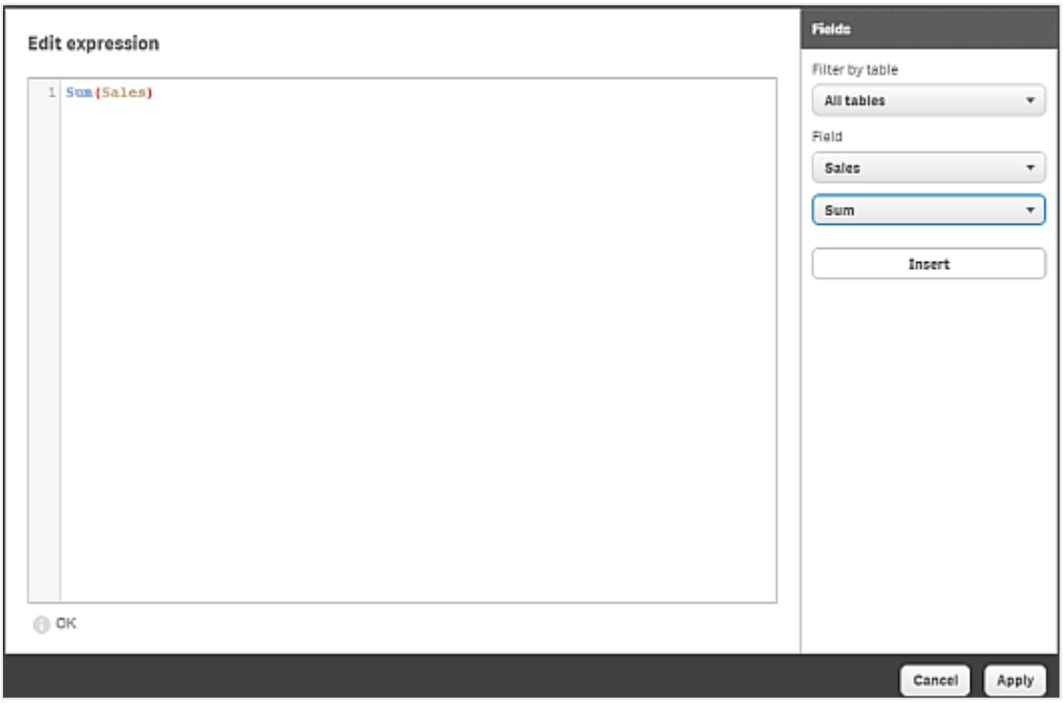
In a script, an expression is evaluated as the script execution passes it by. In visualizations (including charts and tables), expressions are evaluated automatically whenever any of the fields, variables or functions that the expression contains change value or logical status. A few differences exist between script expressions and chart expressions in terms of syntax and available functions.

For detailed reference regarding script functions and chart functions, see the Script syntax and chart functions.

5.3 Working with the expression editor

You can enter the expression editor to add or edit an expression wherever you see the symbol *fx* in the properties panel while editing a visualization. The *fx* symbol indicates an expression field. Click *fx* to enter the expression editor.

You can add expressions in two ways. Simple expressions can be inserted directly from the **Fields** panel by making selections from the available fields and functions. You can add more complex expressions by typing directly into the expression field.



Inserting an expression by selecting from the Fields panel

You can insert an expression by making selections from the **Fields** panel at the right-hand side of the expression editor dialog.

Do the following:

1. If you want to limit the available fields to those from a particular table in your data model, select a table from the drop-down list marked **Filter by table**.
2. Select a field from the **Field** drop-down list.
3. Select the aggregation function you want to use. The functions available are from the group of basic aggregation functions.

4. Click **Insert** to insert the field and the function into the expression editor.

   If you do not select an aggregation function, only the field will be inserted into the expression.

5. Click **Apply** to close the **Add expression** dialog.
   For a dimension or measure, you continue by adding descriptive data for the dimension or measure.

Adding or editing an expression by typing

Do the following:

1. Type the expression directly in the expression editor.
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   As you type in the expression editor, the expression is validated. If there is an error, you see a hint about what is incorrect. Additional error information may be available by clicking the icon next to the hint.

   When you type the name of a function in the expression, a tooltip appears that provides information to help you enter the function correctly, including argument names and qualifiers.

   The tooltip for some chart functions shows the ALL qualifier. It is recommended that you do not use the ALL qualifier. Instead, use the set expression {1}.

   Each line in the expression editor is numbered and syntax highlighting is used.
2. Click **Apply** to close the **Add expression** dialog.
   For a dimension or measure, you continue by adding descriptive data for the dimension or measure.

Auto-complete and color coding

When typing in the expression editor, you get an auto-complete list of matching fields, variables and functions to select from. The list is narrowed down as you continue to type. The color coding helps you to see where fields, variables and functions are used in the expression.

The color coding applies both in the auto-complete list and in the expression itself.

How names are interpreted

It is not recommended to name a variable identically to a field or a function in Qlik Sense. But if you do, you must know how to use them in an expression.

Example:

XXX is a field, a variable and a function. XXX will be interpreted as one of them depending on how you create the expression.

Expression	XXX interpreted as
`$(XXX)`	variable
`Count(XXX)`	field
`XXX()`	function

Rules for expressions

The following rules apply for chart expressions:

- All expressions return a number and/or a string, whichever is appropriate.
- Logical functions and operators return 0 for False, -1 for True. Number-to-string conversions and string-to-number conversions are implicit.
- Logical operators and functions interpret 0 as False and all else as True.
- Expressions that cannot be correctly evaluated, for example as a result of incorrect parameters or functions, return NULL.

Detailed syntax help

You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name.

This feature is supported only when using a computer with a keyboard.

5.4 Using functions in charts

A function is a type of procedure or routine that performs a specific task on data in apps. Qlik Sense contains several hundred ready-made functions that can be used in charts when creating visualizations. Functions can be, for example, mathematical, logical, can operate on financial or date and time information, can be used to manipulate strings, and other situations.

Functions can be grouped into the types:

- Aggregation functions, which use several records as input and produce a single value result.
- Scalar functions, which take a single input and produce a single output.
- Range functions, which produce a single value based on a range of input values.
- Range-producing functions, which are like range functions, but produce a range of values as output.

Many of the functions can be used in both chart expressions and scripts, but some are specific for chart expressions.

The following list shows some examples of functions:

- **Max**: an aggregation function that can be used in scripts and charts.
  For example: **Max(Sales)** calculates the highest value in the field Sales.
- **IF**: a conditional function that can be used in scripts and charts.
  For example: **IF(Amount>0, 'OK','Alarm')** determines if the condition 'is the value of Amount greater than zero?' is met. If it is, OK is written, otherwise Alarm is written.
- **Date#**: an interpretation function that can be used in scripts and charts.
  For example: **Date#(A)** takes the input value **A** and evaluates it as a date.

A few differences exist between script expressions and chart expressions in terms of syntax and available functions. The most important difference is the role of the aggregation functions and the use of field references. The basic rule is that any field name in a chart expression must be enclosed by exactly one aggregation function. An aggregation function can never have another expression containing an aggregation function as argument.

For detailed reference regarding script functions and chart functions, see the Script syntax and chart functions.

5.5 Set analysis and set expressions

Set analysis offers a way of defining a set (or group) of data values that is different from the normal set defined by the current selections.

Normally, when you make a selection, aggregation functions, such as **Sum**, **Max**, **Min**, **Avg**, and **Count** aggregate over the selections that you have made: the current selections. Your selections automatically define the data set to aggregate over. With set analysis you can define a group that is independent of the current selections. This can be useful if you want to show a particular value, for example, the market share of a product across all regions, irrespective of the current selections.

Set analysis is also powerful when making different sorts of comparisons, such as what are the best-selling products compared with poorly-selling products, or this year against last year.

Let us imagine an example in which you start working in an app by selecting the year 2010 in a filter pane. The aggregations are then based on that selection, and the visualizations only show values for that year. When you make new selections, the visualizations are updated accordingly. The aggregations are made over the set of possible records defined by the current selections. With set analysis, you can define a set that is of interest to you and does not depend on the selections.

Creating set expressions

Before looking at the different parts of a set analysis example, there is a distinction that should be made between a set expression and set analysis:

Defining a set of field values is referred to as defining a set expression, whereas using set expressions to analyze data is referred to as set analysis. Consequently, the rest of this section focuses on the set expression and its components.

Here is a set analysis example: `sum( {$<Year={2009}>} Sales )`, in which `{$<Year={2009}>}` is a set expression.

There are two general syntax rules for a set expression:

- A set expression must be used in an aggregation function. In this example, the aggregation function is `sum(Sales)`.
- A set expression must be enclosed by braces, {}. In the example, the set expression is: `{$<Year={2009}>}`.

A set expression consists of a combination of the following parts:

- **Identifiers**. One or more identifiers define the relationship between the set expression and what is being evaluated in the rest of the expression. A simple set expression consists of a single identifier, such as the dollar sign, `{$}`, which means all records in the current selection.
- **Operators**. If there is more than one identifier, an operator or operators are used to refine the set of data by specifying how the sets of data represented by the identifiers are combined to create a subset or superset, for example.
- **Modifiers**. A modifier or modifiers can be added to the set expression to change the selection. A modifier can be used on its own or to modify an identifier to filter the data set.

Examples:

Example 1:

```
{$<Year={2009}>}
```

This set expression contains an identifier `$`, and the modifier `<Year={2009>}`. This example does not include an operator. The set expression is interpreted as: "All records in the current selection that belong to the year 2009".

Example 2:

```
Sum({$<Year={2009}>+1<Country={'Sweden'}>} Sales)
```

This set expression contains the identifiers *$* and *1*, the operator + and the modifiers <*Year={2009}*> and <*Country={'Sweden'}*>.

This set expression is designed to sum the sales for the year 2009 associated with the current selections and add the full set of data associated with the country *Sweden* across all years.

> *Set expressions can only be used in expressions for visualizations, not in script expressions.*

Identifiers, operators and modifiers are described in more detail with in the following subsections.

Identifiers

Identifiers define the relationship between the set expression and the field values or expression being evaluated.

In our example `sum( {$<Year={2009}>} Sales )`, the identifier is the dollar sign, $, and means that the set of records to be evaluated consists of all the records of the current selection. This set is then further filtered by the modifier part of the set expression. In a more complex set expression, two identifiers can be combined using an operator.

This table shows some common identifiers.

Identifier	Description
1	Represents the full set of all the records in the application, irrespective of any selections made.
$	Represents the records of the current selection. The set expression **{$}** is thus the equivalent to not stating a set expression.
$1	Represents the previous selection. $2 represents the previous selection-but-one, and so on.
$_1	Represents the next (forward) selection. $_2 represents the next selection-but-one, and so on.
BM01	You can use any bookmark ID or bookmark name.
MyAltState	You can reference the selections made in an alternate state by its state name.

This table shows some examples with different identifiers.

Example	Result
sum ({1} Sales)	Returns total sales for the app, disregarding selections but not the dimension.
sum ({$} Sales)	Returns the sales for the current selection, that is, the same as sum(Sales).
sum ({$1} Sales)	Returns the sales for the previous selection.
sum ({BM01} Sales)	Returns the sales for the bookmark named *BM01*.

Operators

Operators are used to include, exclude, or intersect parts of or whole data sets. All operators use sets as operands and return a set as result.

This table shows operators that can be used in set expressions.

Operator	Description
+	Union. This binary operation returns a set consisting of the records that belong to any of the two set operands.
-	Exclusion. This binary operation returns a set of the records that belong to the first but not the other of the two set operands. Also, when used as a unary operator, it returns the complement set.
*	Intersection. This binary operation returns a set consisting of the records that belong to both of the two set operands.
/	Symmetric difference (XOR). This binary operation returns a set consisting of the records that belong to either, but not both of the two set operands.

This table shows some examples with operators.

Examples	Results
`sum( {1-$} Sales )`	Returns sales for everything excluded by the selection.
`sum( {$*BM01} Sales )`	Returns sales for the intersection between the selection and bookmark BM01.
`sum( {-($+BM01)} Sales )`	Returns sales excluded by the selection and bookmark BM01.
`Sum({$<Year={2009}>+1<Country={'Sweden'}>} Sales)`	Returns sales for the year 2009 associated with the current selections and add the full set of data associated with the country *Sweden* across all years.

Modifiers

Modifiers are used to make additions or changes to a selection. Such modifications can be written in the set expression. A modifier consists of one or several field names, each followed by one or several selections that can be made in the field. Modifiers begin and end with angle brackets, <>.

A set modifier modifies the selection of the preceding set identifier. If no set identifier is referenced, the current selection state is implicit.

This table shows some examples with modifiers.

Example	Result
sum({$<OrderDate = DeliveryDate>} Sales)	Returns the sales for the current selection where OrderDate = DeliveryDate.
sum({1<Region = {US}>} Sales)	Returns the sales for region US, disregarding the current selection.
sum({$<Region = >} Sales)	Returns the sales for the selection, but with the selection in *Region* removed.

sum({<Region = >} Sales)	Returns the same as the example above. When the set to modify is omitted, $ is assumed.
sum({$<Year={2000}, Region={“U*”}>} Sales)	Returns the sales for the current selection, but with new selections both in *Year* and in *Region*.

5.6 Using variables in expressions

A variable in Qlik Sense is a container storing a static value or a calculation, for example a numeric or alphanumeric value. When you use the variable in the app, any change made to the variable is applied everywhere the variable is used. Variables are defined using the variables overview, or in the script using the data load editor, where the variable acquires its value from a **Let**, **Set** or other control statements in the data load script.

When using variables in expressions, you can change the expression used in a range of charts simultaneously simply by editing the variable.

You open the **Variables** overview by clicking in the edit bar when editing a sheet.

The following actions are available in the variables overview:

- Create a new variable.
- Edit the selected variable.
- Delete the selected variable.

If you want to edit or delete a variable that is defined in the script, you must edit the script.

Getting an overview of all variables in an app

You can get an overview of all variables in an unpublished app.

Do the following:

1. When editing a sheet, click in the edit bar on the sheet to open the variables overview.
   The variables overview opens and displays a list of all variables in the app and their definitions (if any).
2. Select a variable in the list that you want to view details of.
   The variable expands and displays detailed information about the variable, if any: definition, description and tags.

   When a variable is created or edited, all fields except the name field can be left empty.

See also:

Working with the expression editor (page 260)

Creating a variable

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition. Variables are defined using the variables overview or in the script using the data load editor.

You can create a new variable from the variables overview, when editing a sheet in an unpublished app.

Do the following:

1. When editing a sheet, click x= in the edit bar on the sheet to open the variables overview.
   The variables overview opens.
2. Click **Create new**.
   The following input fields for the variable are displayed:
   - **Name** (mandatory)
   - **Definition**
   - **Description**
   - **Tags**

   Press Esc or click 🗑 if you want to cancel creating the new variable. If all input fields are empty, you can also cancel by clicking outside the new variable section in the variables overview or by clicking outside the variables overview window.
3. Type a name for the variable (mandatory). Use the following guidelines when choosing a name:
   - You cannot change the name once you have created the variable.
   - Use a letter as the first character, do not use a number or a symbol.
   - It is not recommended to name a variable identically to a field or a function in Qlik Sense.
     See: *How names are interpreted (page 271)*
   - Some characters have specific uses in Qlik Sense expressions, therefore do not use the following characters when naming a variable: `$ ( ) [ ] "`
   - The name must be unique. You are not allowed to name a variable identically to a reserved variable or a system variable. These variables are not listed in the variables overview, but if you are not allowed to use a certain name, even though you cannot find a duplicate in the variables overview, a reserved variable or a system variable already has this name.
   - A long name is not recommended. If a variable's name is too long, the name cannot be fully displayed in the variables overview.
4. Create a definition for the variable (optional). You can enter the expression editor by clicking *fx* .
   See: *Working with the expression editor (page 260)*

Example:

Set the variable's value to today's date, presented as a number:
Num(Today())

5. Type a description for the variable (optional).
6. Add tags by typing and click ⊕ or press Enter (optional).
7. Save the variable by clicking . You can also save by clicking outside the new variable's section in the variables overview or by clicking outside the variables overview window.
   The variable is added to the top of the list and marked with **New**.

The new variable is created.

See also:

Working with the expression editor (page 260)

Editing a variable

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition.Variables are defined using the variables overview or in the script using the data load editor.

You can choose to edit a variable from the variables overview, when editing a sheet in an unpublished app.

Do the following:

1. When editing a sheet, click x= in the edit bar on the sheet to open the variables overview.
   The variables overview opens.

   > *If you want to edit a variable that is defined in the script, you can either edit in the script, using the data load editor, or delete it from the script and then edit it in the variables overview.*

2. From the list, select a variable that you want to edit and click .
   The variable expands and displays the following:
   - **Definition** (if any)
   - **Description** (if any)
   - **Tags** (if any)
3. Edit the variable as desired:
   - You can open the expression editor and create the definition by clicking *fx* .
     See: *Working with the expression editor (page 260)*.
   - Cancel editing the variable, by pressing Esc.

> *If you click the variable is deleted.*

- Add new tags by typing and and click or press Enter. Remove tags by clicking .

4. Save the changes by clicking . You can also save by clicking outside the variable's section in the variables overview or by clicking outside the variables overview window.

The variable is updated.

See also:

Working with the expression editor (page 260)

Deleting a variable

You can delete variables, from an unpublished app, by deleting them from the variables overview.

Do the following:

1. When editing a sheet, click in the edit bar on the sheet to open the variables overview.
   The variables overview opens.
2. Select the variable you want to delete.

   > *If you want to delete a variable that is defined in the script, you must edit the script. If you remove a variable from the script and reload the data, the variable stays in the app. If you want to fully remove the variable from the app, you must also delete the variable from the variables overview.*

   The details of the variable are displayed.

   > *Deleting a variable cannot be undone.*

3. Click .
   A confirmation message is displayed, asking if you are sure you want to delete the variable.
4. Click **OK**.

The variable is deleted.

Examples of using a variable in an expression

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition.

Example:

The variable *x* contains the text string *Sum(Sales)*.

In a chart, you define the expression *$(x)/12*. The effect is exactly the same as having the chart expression *Sum(Sales)/12*.

However, if you change the value of the variable *x* to for example *Sum(Budget)*, the data in the chart are immediately recalculated with the expression interpreted as *Sum(Budget)/12*.

> *When using variables in expressions, you can change the expression used in a range of charts simultaneously simply by editing the variable.*

How names are interpreted

It is not recommended to name a variable identically to a field or a function in Qlik Sense. But if you do, you must know how to use them in an expression.

Example:

XXX is a field, a variable and a function. XXX will be interpreted as one of them depending on how you create the expression.

Expression	XXX interpreted as
`$(XXX)`	variable
`Count(XXX)`	field
`XXX()`	function

Variable calculation

There are several ways to use variables with calculated values in Qlik Sense, and the result depends on how you define it and how you call it in an expression.

This example requires the following data is loaded in the data load editor:

```
LOAD * INLINE [
    Dim, Sales
    A, 150
    A, 200
    B, 240
    B, 230
    C, 410
    C, 330
];
```

Let's define two variables, from the variables overview:

- **Name** *vSales* **Definition***'Sum(Sales)'*
- **Name** *vSales2* **Definition***'=Sum(Sales)'*

In the second variable, we add an equal sign before the expression. This will cause the variable to be calculated before it is expanded and the expression is evaluated.

If you use the vSales variable as it is, for example in a measure, the result will be the string Sum(Sales), that is, no calculation is performed.

If you add a dollar-sign expansion and call $(vSales) in the expression, the variable is expanded, and the sum of Sales is displayed.

Finally, if you call $(vSales2), the variable will be calculated before it is expanded. This means that the result displayed is the total sum of Sales. The difference between using =$(vSales) and =$(vSales2) as measure expressions is seen in this chart showing the results:

Dim	$(vSales)	$(vSales2)
A	350	1560
B	470	1560
C	740	1560

As you can see, $(vSales) results in the partial sum for a dimension value, while $(vSales2) results in the total sum.

See also:

Working with the expression editor (page 260)

6 Reusing assets with master items

When you create and build your visualizations, you will come to the point when you realize you have items worth saving to reuse in other visualizations and on other sheets, for your own sake as well as for others using your app. You can save visualizations, dimensions and measures, as master items in the assets panel. When your app gets published these master items will be available to others as ready-to-use visualizations, dimensions and measures.

Any updates you make to the master item are applied everywhere the master item is used. For example, you could use a master measure in as many of your visualizations as you like while only having to update it in a single instance to update all instances of the measure in your visualizations.

Master items are very useful, you can use, for example, a master dimension in as many of your visualizations as you like and maintain it in just one place. Any updates you make to the master item will be applied everywhere the master item is used.

One of the purposes with creating and maintaining master items is for other users to explore their own ways and directions in the data, on top of what you have provided in the app as pre-made sheets with visualizations. The users will be able to create their own visualizations with your pre-made master dimensions and master measures, for example.

6.1 Create master dimensions

When you are working with an unpublished app, you can create master dimensions so that they can be reused. Users of a published app will have access to the master dimensions, but will not be able to modify them.

You can create a master dimensions in different ways.

In addition to creating master dimensions from the assets panel when working with a sheet, you can also create master dimensions from the data model viewer.

Creating a master dimension from a field

When you are working with an unpublished app, you can create master dimensions so that they can be reused. You can create a master dimension from the **Fields** section of the assets panel.

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the fields tab.
3. Click the field you want to use to create a dimension.
   The preview opens.
4. Click at the bottom of the preview.

The **Create new dimensions** dialog opens with the field you selected. The field name is also used as the name of the dimension.

5. Select if the dimension is to be single or drill-down.
6. Edit the name if you want to.
7. Type a description for the dimension (optional).
8. If you want to specify a color, click ▼ in the color drop down and select a color through one of the following methods:
   - Click one of the colors in the palette.
   - Type a 6 character color code in the Hex input field: **#**.
   - Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.
9. Add tags (optional).
10. Click **Add dimension**.
11. Click **Done** to close the dialog.

The dimension is now saved in the **Dimensions** category in the master items, and you can use it in visualizations.

*You can quickly add several dimensions as master items by clicking **Add dimension** after adding each dimension. Click **Done** when you have finished.*

*Direct Discovery fields are indicated by in the **Fields** section of the assets panel.*

Creating a master dimension from the assets panel

When you are working with an unpublished app, you can create master dimensions so that they can be reused. Users of a published app will have access to the master dimensions, but will not be able to modify them.

You can only create master dimensions when you are working with an unpublished app.

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the master items tab.
3. Click the **Dimensions** heading to expand the category.
4. Click **Create new**.
   The **Create new dimensions** dialog opens.
5. Select if the dimension is to be single or drill-down.

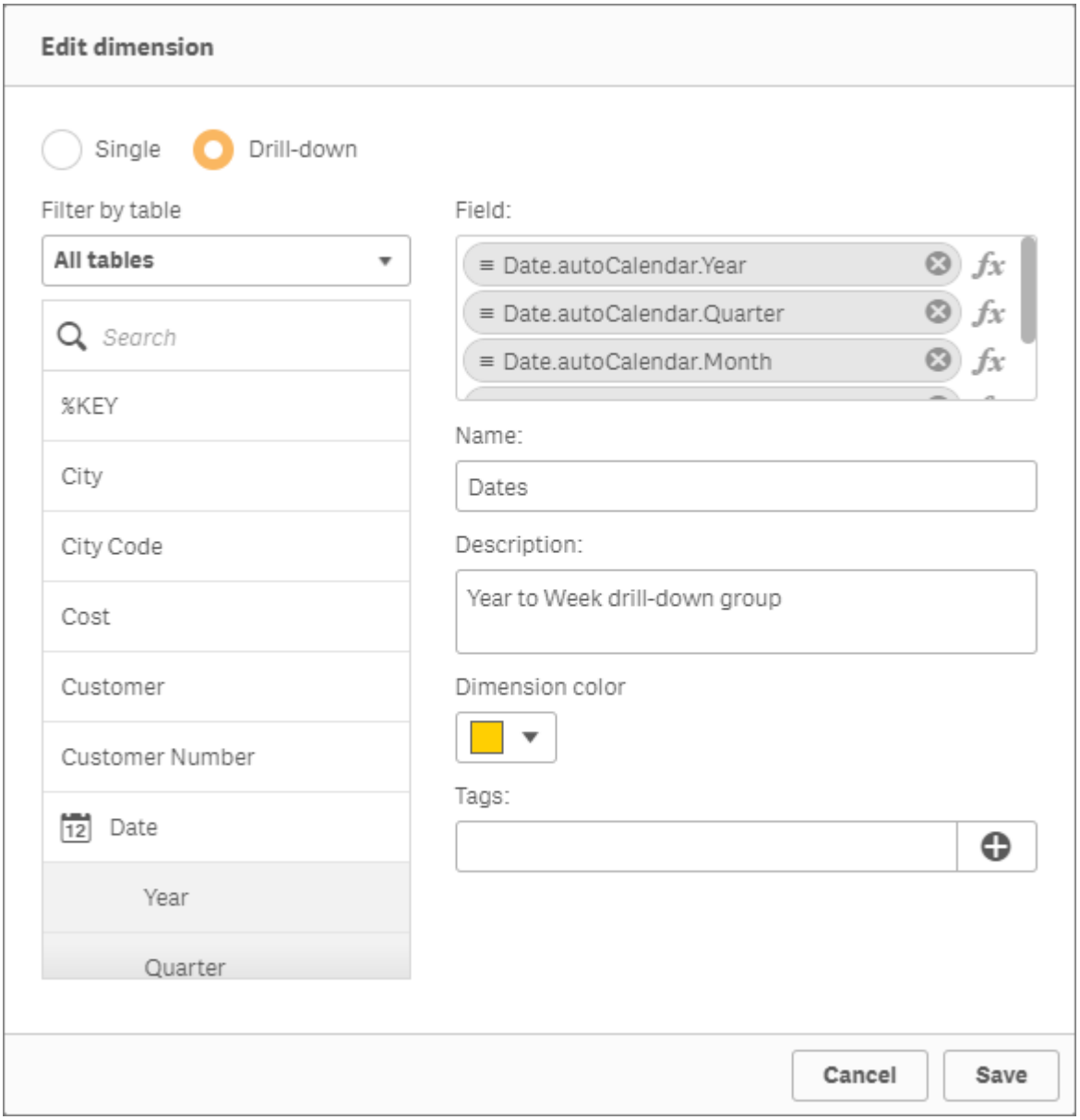
6. Click a field on the left-hand side to select it.
   The name of the field is automatically added as the name of the dimension.
7. Change the name if you want to.
8. Type a description for the dimension (optional).
9. If you want to specify a color, click ▼ in the color drop down and select a color through one of the following methods:
   - Click one of the colors in the palette.
   - Type a 6 character color code in the Hex input field: **#**.
   - Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.
10. Add tags (optional).
11. Click **Add dimension**.
12. Click **Done** to close the dialog.

The dimension is now saved in the **Dimensions** category in the master items, and you can use it in visualizations.

*You can quickly add several dimensions as master items by clicking **Add dimension** after adding each dimension. Click **Done** when you have finished.*

Creating a drill-down dimension

When adding a dimension, you can select between creating a single or a drill-down dimension. The following description explains how to create a drill-down group from the **Create new dimensions** dialog.



Do the following:

1. Select **Drill-down** as dimension type.
2. Click at least two fields from the fields list on the left-hand side to insert them as the referenced fields.

   You can filter which table to select fields from in the drop-down list.

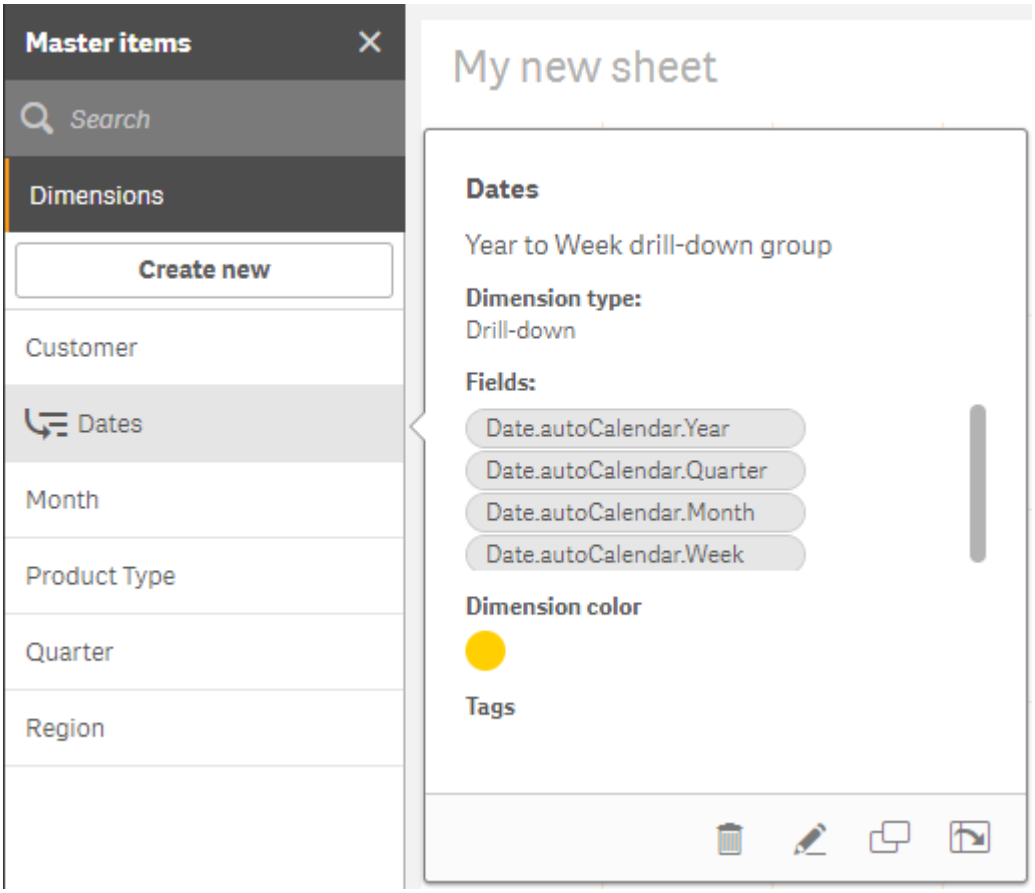
   You can rearrange the order of the fields you have selected by dragging them to new positions in the list of selected fields.

3. Type a name for the dimension.

4. Type a description for the dimension (optional).
5. If you want to specify a color, click ▼ in the color drop down and select a color through one of the following methods:
   - Click one of the colors in the palette.
   - Type a 6 character color code in the Hex input field: **#**.
   - Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.
6. Add tags (optional).
7. Click **Add dimension**.
8. Click **Done** to close the dialog.

The drill-down dimension is now saved in the **Dimensions** category among the master items.

When you click the dimension in the panel on the left-hand side, the preview displays the dimension type and which fields are included in the drill-down dimension.



Creating a calculated dimension

You can create a calculated dimension from the **Master items** tab in the assets panel. The expression editor opens from the **Create new dimensions** dialog.

Do the following:

1. Click the **Dimensions** heading on the **Master items** tab to expand the category.
2. Click **Create new**.
   The **Create new dimensions** dialog opens.
3. Click *fx* in the **Field** text box to open the **Add expression** dialog.

You will now be able to add expressions in different ways, depending on you preferences and of different levels of complexity.

> *You can also add an expression by typing directly into the **Field** text box , but you will then not be provided with syntax highlighting and syntax check.*

Using a common function

1. Select a field from the drop-down list.
2. Click the aggregation function you want to use.
3. Click **Insert** to insert the function and the field into the expression editor.

   > *You can insert just a function or just a field by selecting only one of them.*

4. Click **Apply** to close the **Add expression** dialog.
   Continue by adding the descriptive data for the dimension.

Adding an expression by typing

1. Type the expression directly in the expression editor.
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   > *As you type in the expression editor, the expression is validated continuously. If there is an error, you see a hint about what is incorrect. Additional error information may be available by clicking the icon next to the hint.*

   Each line in the expression editor is numbered and syntax highlighting is used.
2. Click **Apply** to close the **Add expression** dialog.
   For a measure, you continue by adding the descriptive data for the measure.

Adding an expression through the properties panel

You can add an expression to a visualization through the properties panel.

1. Open the sheet with the visualization that you want to edit.
2. Click **Edit** to open the properties panel. (If it is hidden, click in the lower right-hand corner to open it.)
3. Click the visualization that you want to edit.

The properties panel for that visualization is displayed on the right-hand side.

4. Under **Data**, click **Ad data** and select **Dimension**.
   A dimension text box is displayed.
5. Type your expression. The expression must begin with an equals sign (=), otherwise the string will be interpreted as text.

Detailed syntax help

You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name.

This feature is supported only when using a computer with a keyboard.

Adding the descriptive data for the dimension

After having entered the expression, you need to add some descriptive information.

1. Type a name for the dimension.
2. Type a description for the dimension (optional).
3. Optionally, click ▼ in the color drop down and select a color through one of the following methods:
   - Click one of the colors in the palette.
   - Type a 6 character color code in the Hex input field: **#**.
   - Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.
4. Add tags (optional).
5. Click **Add dimension**.
6. Click **Done** to close the dialog.

The calculated dimension is now saved in the **Dimensions** category of the **Master items**, and you can use it in visualizations.

6.2 Create master measures

When you are working with an unpublished app, you can create master measures so that they can be reused. Users of a published app will have access to the master measures, but will not be able to modify them.

A measure is a combination of an expression and descriptive data, such as name, description and tags. You can add the expression for the measure in different ways.

In addition to creating master measures from the assets panel when working with a sheet, you can also create master measures from the data model viewer.

Creating a master measure from a field

When you are working with an unpublished app, you can create master measures so that they can be reused. You can create a master measure from the **Fields** section of the assets panel.

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the fields tab.
3. Click the field you want to use to create a measure.
   The preview opens.
4. Click *fx* at the bottom of the preview.
5. The **Create new measure** dialog opens with the field you selected as the name of the measure and as a part of the expression.
6. Click *fx* in the **Expression** field to open the **Edit expression** dialog.
7. Type the expression directly in the expression editor (the main window).
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   > *As you type in the expression editor, the expression is validated continuously. If there is an error, you see a hint about what is incorrect in the lower left-hand corner. Additional error information may be available by clicking the icon next to the hint.*

   Each line in the expression editor is numbered and syntax highlighting is used.

   > *You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name, and only when using a computer with a keyboard.*

8. Click **Apply** to close the **Add expression** dialog.
   Now you need to add some descriptive data for the measure.
9. Edit the name if you want to.
10. Type a description for the measure (optional).
11. If you want to specify a color, click ▼ in the color drop down and select a color through one of the following methods:
    - Click one of the colors in the palette.
    - Type a 6 character color code in the Hex input field: **#**.
    - Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.
12. Add tags (optional).
13. Click **Create**.

The measure is now saved in the **Measures** category in the master items, and you can use it in visualizations.

> *Direct Discovery fields are indicated by in the **Fields** section of the assets panel.*

Creating a master measure with a common aggregation function

When you are working with an unpublished app, you can create master measures so that they can be reused. You can easily create a measure using one of the most common aggregation functions by selecting the function and the field from drop-down lists.

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the master items tab.
3. Click the **Measures** heading to expand that category.
4. Click **Create new**.
   The **Create new measure** dialog opens.
5. Click in the **Expression** field to open the **Add expression** dialog.
   You find drop-down lists for selecting a field and a common function on the right-hand side.
6. If you want to show fields from a particular table, select this table in the top drop-down list (optional).
7. Select a field from the **Field** drop-down list.
8. Select a function from the bottom drop-down list.

   > *You can insert just a field by not selecting a function.*

9. Click **Insert** to insert the field and the function into the expression editor.

   > *You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name, and only when using a computer with a keyboard.*

10. Click **Apply** to close the **Add expression** dialog.
    Now you need to add some descriptive data for the measure.
11. Type a name for the measure.
12. Type a description for the measure (optional).
13. If you want to specify a color, click ▼ in the color drop down and select a color through one of the following methods:

- Click one of the colors in the palette.
- Type a 6 character color code in the Hex input field: **#**.
- Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.

14. Add tags (optional).
15. Click **Create**.

The measure is now saved in the **Measures** category in the master items, and you can use it in visualizations.

Creating a master measure by typing the expression

When you are working with an unpublished app, you can create master measures so that they can be reused. You can add complex expressions by typing the expression into the expression editor.

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the master items tab.
3. Click the **Measures** heading to expand that category.
4. Click **Create new**.
   The **Create new measure** dialog opens.
5. Click in the **Expression** field to open the **Add expression** dialog.
6. Type the expression directly in the expression editor (the main window).
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   > *As you type in the expression editor, the expression is validated continuously. If there is an error, you see a hint about what is incorrect in the lower left-hand corner. Additional error information may be available by clicking the icon next to the hint.*

   Each line in the expression editor is numbered and syntax highlighting is used.

   > *You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name, and only when using a computer with a keyboard.*

7. Click **Apply** to close the **Add expression** dialog.
   Now you need to add some descriptive data for the measure.
8. Type a name for the measure.
9. Type a description for the measure (optional).
10. If you want to specify a color, click ▼ in the color drop down and select a color through one of the following methods:

- Click one of the colors in the palette.
- Type a 6 character color code in the Hex input field: **#**.
- Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.

11. Add tags (optional).
12. Click **Create**.

The measure is now saved in the **Measures** category in the master items, and you can use it in visualizations.

6.3 Create calendar measures

To analyze data over relative time ranges, use calendar measures. For example, you might want to compare current year-to-date sales figures with figures from the same period the previous year.

Calendar measures aggregate data from a field over a time range, and are saved in the **Measures** category in the master items. Calendar measures comprise a field to be aggregated, an aggregation, a date field, and a time range for that date field that sets which data is included in the aggregation. You create calendar measures under **Fields** in the **Assets** panel, using the **Create calendar measures** dialog.

You can aggregate fields from tables loaded in **Data manager** or from a script in **Data load editor**, as long as the field is in the same table as the date field, or is in an associated table.

However, the date field must be from a table that has been loaded using **Data manager**, because calendar measures use expressions tagged as date & time fields that are declared in autoCalendar, and date fields are only mapped to autoCalendar when loaded in **Data manager**. Calendar measures support the following aggregations with the aggregated field: Sum, Count, Avg, Min, and Max.

*Calendar measures do not support calendars created using the **Data load editor**. If you use calendars created using **Data load editor** and want to create calendar measures, you must load a table containing a date field using **Data manager** for use with your tables loaded using **Data load editor**.*

If your date field is subject to more than one calendar and both calendars are qualified for use with calendar measures, then the first calendar loaded in the data load script is used in the calendar measures.

A calender measure can use one of the following time ranges are available for use with calendar measures: weekly, monthly, quarterly, and yearly. Within each time range, different measures exist for periods such as current month, year-to-date, and current week last year. The following time ranges and measures are available for creating calendar measures:

Time ranges	Measures	Description
Yearly	YTD	The year to date for all years.
	YTD Current Year	The year to date for the current year.
	YTD Last Year	The year to date for last year.
Monthly	MTD	The month to date for all months and years.
	MTD Current Month	The month to date for the current month.
	MTD Last Month	The month to date for last month.
	Current Month	All dates this month.
	Current Month Last Year	All dates this month last year.
	Last Month	All dates last month.
Quarterly	QTD	The quarter to date for all years.
	QTD Current Quarter	The quarter to date for the current quarter.
	QTD Last Quarter	The quarter to date for the last quarter.
	Current Quarter	All dates in the current quarter.
	Current Quarter Last Year	All dates in the current quarter last year.
	Last Quarter	All days for the last quarter.
Weekly	WTD	The week to date for all weeks across all years.
	WTD Current Week	This week to date for the current week.
	WTD Last Week	The week to date for the last week.
	Current Week	All dates this week.
	Current Week Last Year	All dates this week last year.
	Last Week	All dates last week.

Once created, calendar measures are treated identically to master measures. That is, calendar measures are reusable and editable while an app is unpublished. Users of a published app will have access to the calendar measures, but will not be able to modify them.

Creating a calendar measure from a field

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to open the **Fields** tab.
3. Right-click a field and select **Create calendar measures**.
   By default, the field you right-clicked will be included as the **Aggregated field**.

4. Select a date field from the **Date field** drop-down list.
5. Select a field from the **Aggregated field** drop-down list.
6. Select an aggregation from the **Aggregation** drop-down list.
7. Select a time range from the **Time range** drop-down list.
   A list of the available measures displays under **Preview of measures**.
   You can toggle the display of the measures' expressions by selecting the **Preview of measures** switch.
8. Select the calendar measures to add to your master items.
   By default, all measures are selected.
9. Click **Save to master items**.
10. Click **Close**.

6.4 Creating a master visualization

You can create a master visualization to be able to reuse it. Users of a published app will have access to the master visualizations, but will not be able to modify them.

You can only create master visualizations when you are working with an unpublished app.

Do the following:

1. While editing a sheet, drag a visualization from the sheet to the master items.
   If you have given the visualization a title, this is automatically added as the name of the master visualization.
2. Add a name, or change the name if you want to.
3. Type a description for the visualization (optional).
4. Add tags (optional).
5. Click **Add**.

The visualization is now saved to the master items tab.

You can also add a visualization to the master items by long-touching/right-clicking it on the sheet, and selecting ***Add to master items****.*

6.5 Editing a master dimension

When you update a master dimension, the changes will be reflected in all its instances, including all visualizations that use it.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the dimension that you want to edit.
   The preview opens.
4. Click at the bottom of the preview.
   If the dimension is used on a sheet, a dialog is displayed to inform you that any changes to the master dimension will be applied to all its instances on the sheets.
5. Click **OK**.
   The **Edit dimension** dialog opens, where you update the field or expression, name, description and tags.
6. Click **Save**.

The dimension is now updated.

You can also edit a master item from its preview. You open the preview by clicking an item in the master items.

6.6 Editing a master measure

When you update a master measure, the changes will be reflected in all its instances, including all visualizations that use it.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the measure that you want to edit.
   The preview opens.
4. Click at the bottom of the preview.
   If the measure is used on a sheet, a dialog is displayed to inform you that any changes to the master measure will be applied to all its instances on the sheets.
5. Click **OK**.
   The **Edit measure** dialog opens, where you update the expression, name, description, color, and tags.
6. Click **Save**.

The measure is now updated.

You can also edit a master item from its preview. You open the preview by clicking an item in the master items.

6.7 Editing a master visualization

When you update a visualization in the master items, the changes will be reflected in all instances of the master visualization.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the visualization that you want to edit.
   The preview opens.
4. Click at the bottom of the preview.
   If the visualization is used on a sheet, a dialog is displayed to inform you that any changes to the master visualization will be applied to all its instances on the sheets.
5. Click **OK**.
   The visualization opens for editing.
6. Make the changes you want, and click **Done** in the upper right corner of the visualization to finish editing.

The visualization is updated and reflected in all its instances.

You can also edit a master item from its preview. You open the preview by clicking an item in the master items.

6.8 Assigning colors to master items

To ensure colors are used consistently for the same dimensions and measures in visualizations, you can assign colors to your master items. Colors assigned to master dimensions and master measures persist across all instances of those master items in all visualizations. If you change the color used for the master item, the color will be updated across all instances of that master item. Optionally, master item colors can be disabled for individual visualizations.

Visualizations use master dimension colors when **Single color** is selected in the **Colors and legend** section of the visualization properties panel. Master measure colors are used when **Single color** or **Multicolored** are selected in the **Colors and legend** section of the visualization properties panel.

By default, if a visualization's default **Auto** settings use the **Single** or **Multicolored**, master item colors will be applied automatically. If they do not, you must switch to **Custom** and select a supported setting. Master item colors can be disabled in individual visualizations.

In a visualization with colors specified for both master dimension and master measure, Qlik Sense defaults to the master dimension color. Master measure colors can be applied using the **Use library colors** drop-down and selecting **Measure** in the **Colors and legend** section of the visualization properties panel. In visualization with a mix of master measures with assigned colors and measures without assigned colors, the other measures will use the default palette colors.

Master dimensions can have colors assigned to their distinct values. See: *Assigning colors to master dimension values (page 290)*.

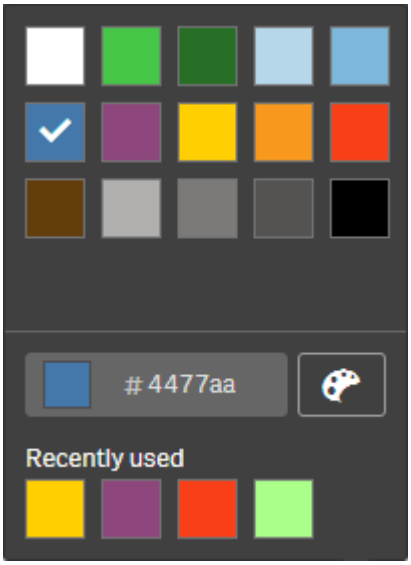
When assigning colors to your master items, you have the following options:

- Choose a color from the default palette
- Type a hexadecimal color code
- Choose a color using advanced color options

Assigning a color from the default color palette

Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Click to display the master items.
3. Select a master item from your library.
4. Click .
5. Click ▼ in the color drop-down.
6. Select one of the colors in the palette.
7. Click outside the dialog.
8. Click **Save**.



The color dialog with the default color palette

Assigning a color using a hexadecimal color code

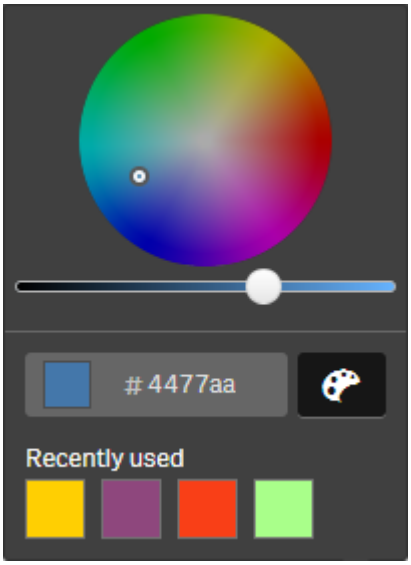
Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Click to display the master items.
3. Select a master item from your library.
4. Click .
5. Click ▼ in the color drop-down.
6. Type a 6 character color code in the input field: **#**.
7. Click outside the dialog or press Enter.
8. Click **Save**.

Assigning a color using advanced color options

Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Click to display the master items.
3. Select a master item from your library.
4. Click .
5. Click ▼ in the color drop-down.
6. Click at the bottom of the dialog.
   The dialog displays the advanced options.
7. Select a color in the color wheel.
   The selected color changes and the Hex color code updates accordingly.
8. Optionally, adjust the color saturation using the slider.
   The saturation changes and the Hex color code updates accordingly.
9. Click outside the dialog.
10. Click **Save**.



The color dialog with the advanced options

Assigning colors to master dimension values

You can assign colors to the distinct values contained in a master dimension. This ensures that the distinct values of your dimensions use the same colors in all visualizations. Colors assigned to values are used when you choose to color **By dimension** and have **Library colors** enabled. If you choose to color by Single color, the master dimension's color is used instead.

Assigning colors to master dimension values has the following limitations:

- A maximum of 100 colors can be assigned to a dimension's values.
- Dimension values cannot be longer than 1024 characters. Longer values are disabled in the list of values.
- Drill-down dimensions do not support assigning colors to dimension values

> *You must not assign colors to master dimension values if you use section access or work with sensitive data because the values may be exposed.*

The **Value colors** section of **Edit dimensions** contains the options for assigning colors to a dimension's distinct values. You can search the list of values with 🔍 .

Qlik Sense automatically applies an auto fill to your values to provide a default color. The auto fill is either a single color or a color scheme. Changing your auto-fill settings will not change colors you have assigned to values.

In addition to distinct values, you can set colors for the values classified as others in a visualization, that is, the collection of distinct values that fall outside the displayable values in a dimension. You can also set colors for null values.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Click to display the master items.
3. Select a master dimension from your library.
4. Click .
5. Click **Value colors**.
6. If you want to change the auto fill settings, set **Auto fill** to **Custom** , select the auto fill method, and either select a single color or color scheme.
7. Select a value and do one of the following:
   - Select a color in the color wheel, and optionally adjust the saturation slider.
   - Type a 6 character color code in the Hex input field: #.

   Values assigned colors display the icon.
8. If you want to remove an assigned color, select the value and click .
9. Optionally, to assign a color to **Others** or **Null values**, click ▼ and do one of the following:
   - Click one of the colors in the palette.
   - Type a 6 character color code in the Hex input field: #.
   - Click at the bottom of the dialog, select a color in the color wheel, and optionally adjust the saturation slider.
10. Click **Save**.

6.9 Tagging master items

You can use tags to organize master items. You will find matches in tags when searching in the assets panel.

Each tag can contain a maximum of 31 characters, and each master item can have up to 30 tags.

Adding tags to a master item

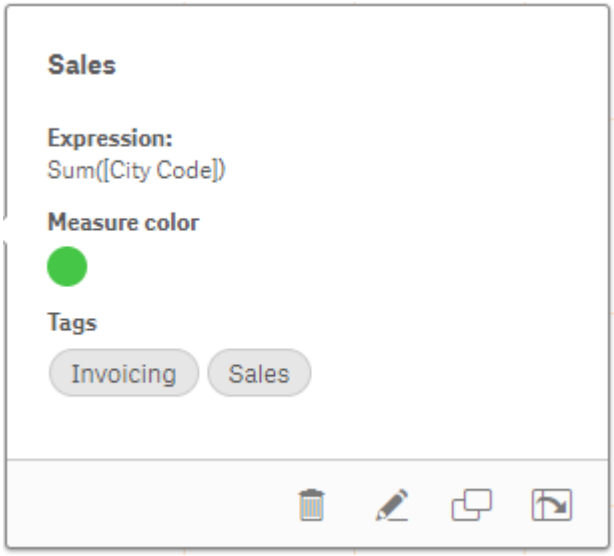
You can add tags when creating or editing a master item.

Adding tags while creating a new measure

You can add tags by clicking ⊕ or by pressing Enter.

Previewing tags

In the assets panel, tags are displayed when previewing dimensions, measures and visualizations.



6.10 Deleting a master dimension or master measure

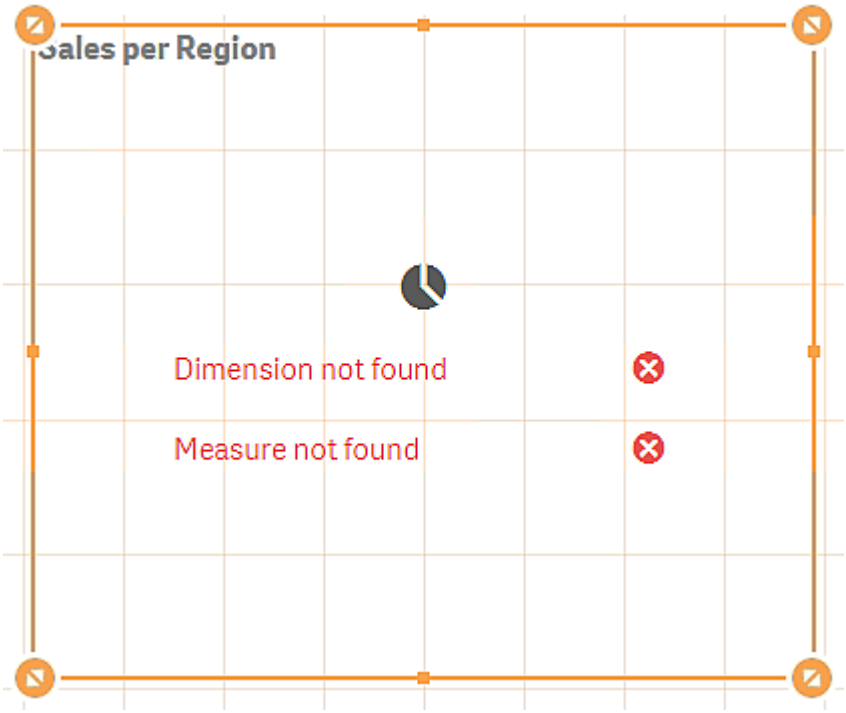
You can delete dimensions and measures from the master items as long as the app is not published.

> *If you delete a master dimension or master measure, the visualizations that use the deleted master item will not work unless you replace it with a new dimension or measure.*

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the dimension or measure that you want to delete.
   The preview opens.
4. Click at the bottom of the preview.
   A dialog is displayed stating that all visualizations that use the dimension or measure will stop working.
5. Click **OK**.

The dimension or measure is deleted from the master items, and all visualizations on the sheets that used the deleted item do not work anymore. You see the text **Dimension not found** or **Measure not found** on those visualizations.



This visualization is lacking both a dimension and a measure, both which have been deleted from the master items

Replacing an invalid dimension or measure

When a dimension or measure has been deleted from the master items, all visualizations that reference to the deleted master item will not work anymore, until the missing dimension or measure is replaced.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side. Click to display the master items.
2. Drag a dimension or measure from the **Dimensions** or **Measures** sections to the visualization on the sheet.
   The shortcut menu opens.
3. Select **Replace invalid dimension** or **Replace invalid measure**.

The visualization is complete and works again.

6.11 Deleting a master visualization

You can delete visualizations from the master items as long as the app is not published.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.

2. Click to display the master items.
3. Click the visualization that you want to delete.
   The preview opens.
4. Click at the bottom of the preview.
   A dialog is displayed stating that wherever this visualization is used on sheets, there will be invalid instances of it.
5. Click **OK**.

The visualization is deleted from the master items, and on all sheets where this visualization was used, you see invalid visualizations. You now need to replace the invalid visualization with other ones, or delete the instances.

You can also delete visualizations from the preview that is displayed when clicking the visualization in the master items.

Replacing an invalid visualization on a sheet

The representation of the invalid visualization is there to tell you that there used to be a visualization at a certain location on the sheet, but the invalid visualization serves no purpose.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side. Click to display the master items.
2. Drag a visualization from the master items to the location of the invalid visualization on the sheet.

The invalid visualization is replaced.

Deleting an invalid visualization

1. In sheet view, click **Edit** in the toolbar.
2. Long-touch/right-click on the invalid visualization and select **Delete** in the shortcut menu.

The invalid visualization is deleted.

7 Managing apps

Once you have created and built an app with the sheets and visualizations you want it to have, you may want to fine-tune it to make it easy and efficient to use, not only for yourself but also for other people.

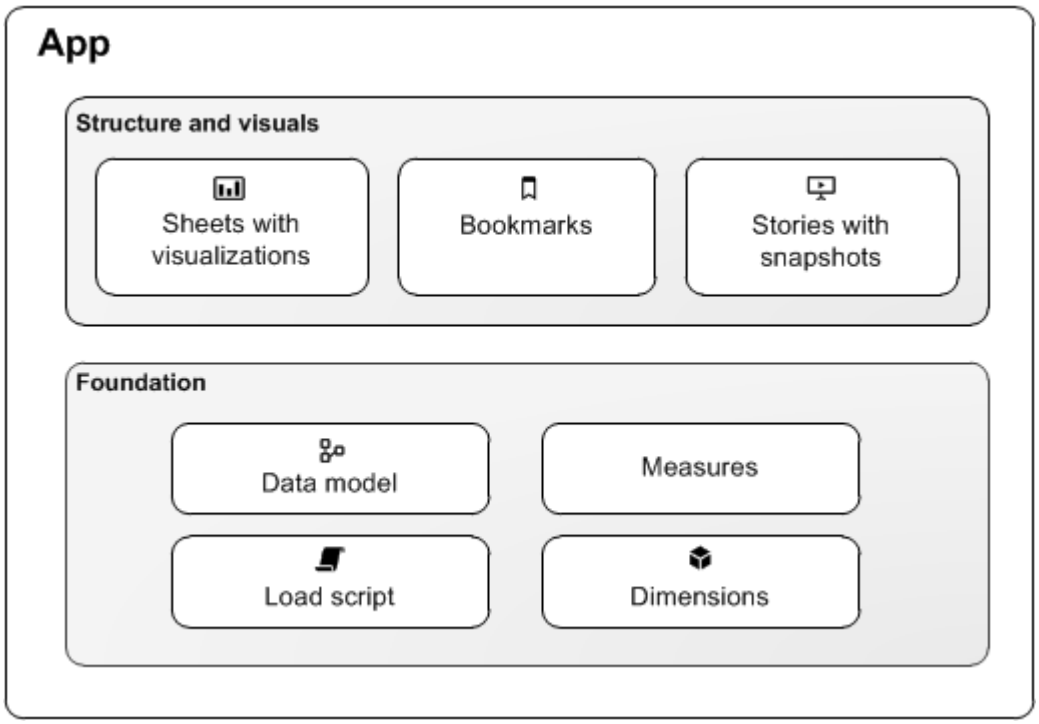
You can, for instance:

- Apply app styling (logo and header)
- Create reusable master items (visualizations, dimensions and measures)
- Add bookmarks to keep track of important and interesting data selections and connections
- Change the app's title and description, and also add a thumbnail to it
- Duplicate an app, which is useful if you want to use a published app as a base of your own

7.1 Apps

A Qlik Sense app is a collection of reusable data items (measures, dimensions and visualizations), sheets and stories. It is a self-contained entity that includes the data to analyze in a structured data model.

The purpose of an app is to let you and others make data discoveries and decisions using data visualizations and making selections.



Building blocks of an app

Foundation

Data load script	You use a data load script to load data into the app. The script connects to a data source (database, Excel sheet, etc.) and retrieves the data.	
Data model	The loaded data is structured in a data model. You edit the data load script and reload the data to build the data model you find is best suitable for your app.	
Measures	Measures are calculations for use in visualizations. Measures are created from an expression composed of aggregation functions, such as **Sum** or **Max**, combined with one or several fields.	*Measures (page 199)*
Dimensions	Dimensions are fields for use in visualizations. Dimensions determine how the data in a visualization is grouped - for example total sales per country or number of products per supplier.	*Dimensions (page 196)* *Fields (page 207)*

Structure and visuals

Sheets	Sheets include data visualizations, such as charts and tables. You create a structure in the app by grouping visualizations with different purposes on different sheets.	
Bookmarks	Bookmarks are shortcuts to a certain set of selections on a particular sheet.	
Stories	Stories are based on snapshots of visualizations. You present your data by creating a story that guides you to new insights by combining snapshots of data at specific times and selection states.	

More about apps

The app makes it possible for people to create new visualizations based on any questions they might have, for example by using dimensions and measures that are defined in the app, thus further developing the app for personal use or to share with others.

Whoever creates an app is automatically designated as its owner. An app can be re-used, modified and shared with others, depending on access rights. Different actions can be carried out depending on if the app is published or not.

The .qvf file format is a proprietary format.

In Qlik Sense Desktop, apps are typically stored in <user>\Documents\Qlik\Sense\Apps, as <Appname>.qvf, where <Appname> is the name of the app.

7.2 On-demand apps

On-demand apps enable you to load and analyze big data sources in Qlik Sense. Trying to analyze an entire big data store at one time is highly inefficient. Nevertheless, to make representative visualizations, all the data must be discoverable. Qlik Sense on-demand apps give users aggregate views of big data stores and allow them to identify and load relevant subsets of the data for detailed analysis.

On-demand apps are made up of several building blocks or components, and some of those components are built by users with advanced scripting skills.

Most users who use on-demand apps to explore big data sets access them as published apps. There are two points at which most users will use on-demand apps:

1. In a published on-demand selection app, where the user selects data and generates an on-demand app from the **App navigation** bar.
2. In a stream where a generated on-demand app is published.

Generating an on-demand app

You generate an on-demand app when you have selected a manageable subset of data using an on-demand selection app. Any selection app you are working with will contain one or more on-demand apps in its **App navigation** bar at the bottom.

The on-demand apps shown on the **App navigation** bar have completion indicators that start to turn green as you make selections in the selection app. Each on-demand app on the app navigation bar has a limit on the amount of data it can contain. When selections are made in the selection app, the completion indicator shows when the amount of data selected is within the bounds set for the on-demand app.

Once an on-demand app's indicator turns completely green, you can generate that app with the currently selected data. Or you can choose to open an instance of that app that was generated previously with another selection of data. Every on-demand app in the app navigation bar can be generated multiple times, and those generated apps remain accessible. When the maximum number of apps has been generated, you must delete an existing app before you can generate a new on-demand app. On-demand apps also may have an expiration time after which they are automatically deleted.

The maximum number of apps and the retention time are set on the on-demand app navigation link. The app navigation link is one of the building blocks of on-demand apps, and it is usually added by the creator of the selection app.

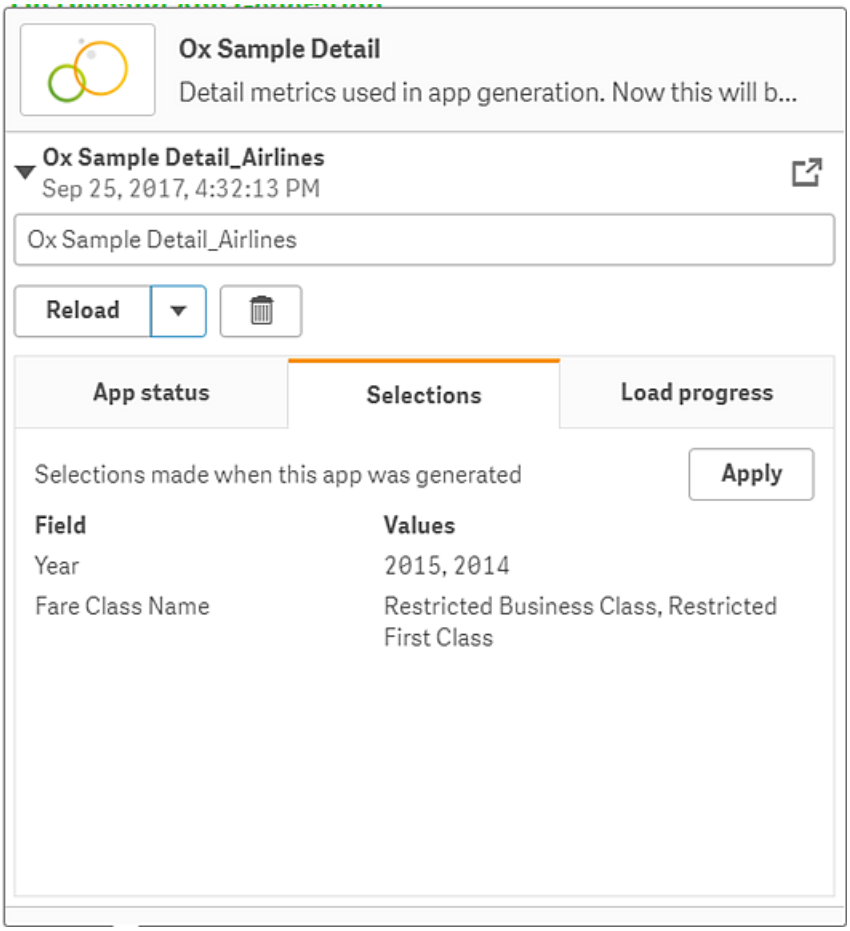
Do the following:

1. Open an on-demand selection app.
2. Select from the visualization objects in the selection app.

3. When the completion indicator on an on-demand app in the **App navigation** bar turns completely green, click the on-demand app.
   You can select an on-demand app in the **App navigation** bar to open its generation panel. There you can click the ⓘ to see the **Constraint** (maximum number of records allowed) and the number of records currently selected. You can also see the number of values selected for each field and any constraints on the fields. When on-demand apps are created, constraints can be placed on individual fields. For example, a field for Year might be limited so that no more than two values can be selected. When the number of records (**Row count**) currently selected is less than or equal to the maximum number of records allowed, the completion indicator turns completely green. An app cannot be generated, however, until all the constraints have been met. If the row count is within the constraint but one or more of the fields have not met the requirements of their constraints, the **Generate new app** button will not be enabled.

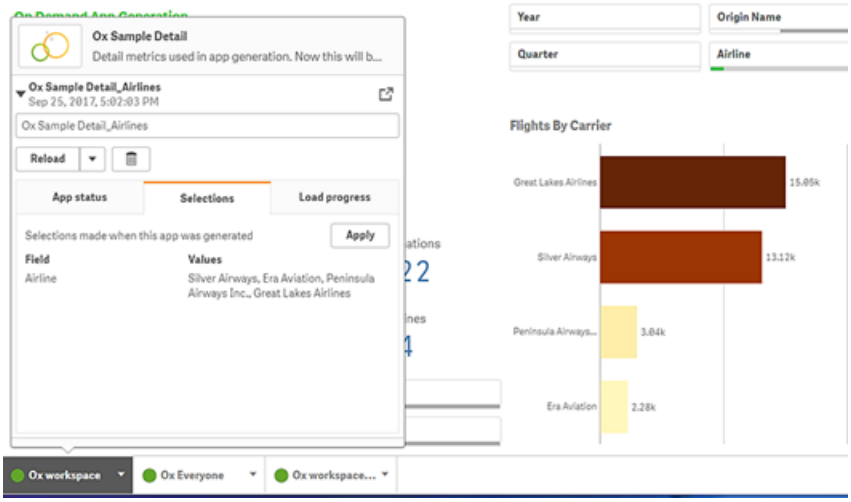
   > *If you select **Generate new app** when constraints panel is open, you will not see the generated app. Click the ⓘ to close the panel, and you will see the new app listed if it generated successfully.*

4. Click the **Generate new app** button to create a new instance of the on-demand app with the data currently selected.
   The new instance of the app is generated and appears in the generation panel above the **Generate new app** button.
   To see more about the generated app, open its detail panel.



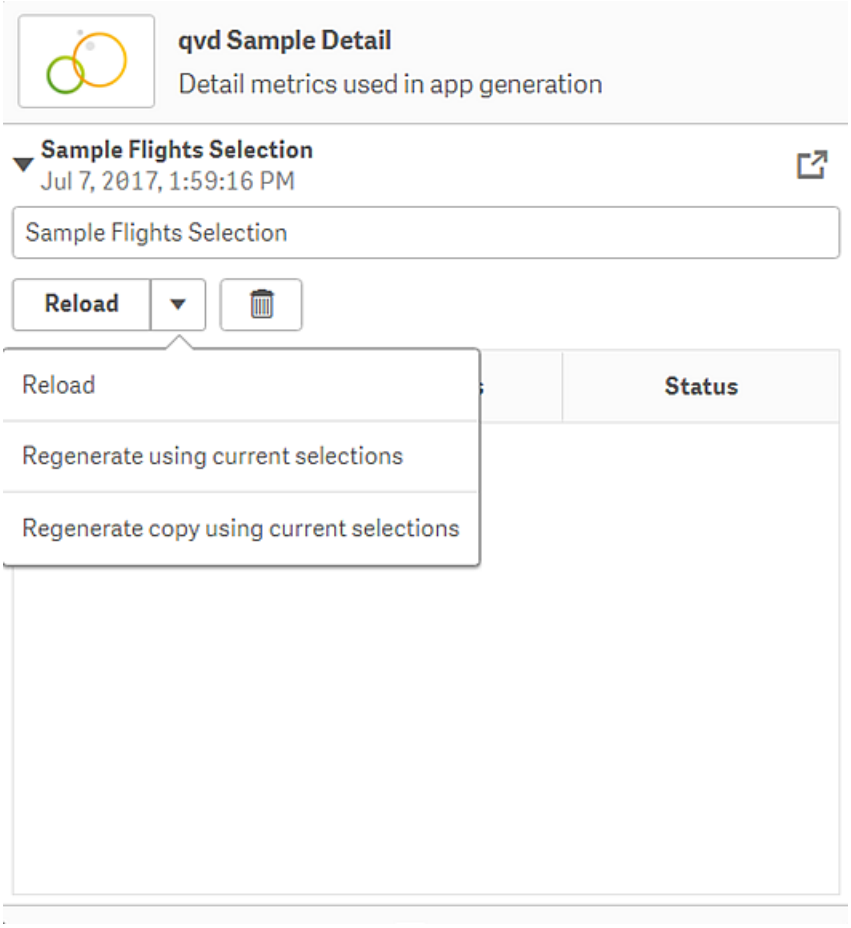
In this view, you can also rename the on-demand app. By default, on-demand apps are assigned the name of the navigation point from which they are generated, and the user's name is appended. For example, when the name of the navigation point is "Ox Sample Detail," the default name of the generated on-demand app would be "Ox Sample Detail_John-Doe" for user "John Doe." In the illustration above, the name of the on-demand app has been changed to "Ox Sample Detail_Airlines." You can rename an on-demand app even if it has been published.

The **Apply** button applies the selections listed on the generated on-demand app's **Selections** tab to the selection app.



5. Select **Open app** from the ••• menu to open the generated app.

You can elect to open the app in a new tab by clicking ⧉.
You can also reload data and regenerate an on-demand app. The **Reload** menu is available when the detail panel is open:



The selections on the **Reload** menu work as follows:

- **Reload**: reloads the data based on the current selections that have been made within the on-demand app.
- **Regenerate using current selections**: regenerates the on-demand app using the current selections that have been made within the selection app.

> *The **Apply** button on the **Selections** tab applies the on-demand app's selections to the selection app. The on-demand app's selections are those listed as **Selections made when this app was generated**. See the illustration above. This is the reverse of what is done when **Regenerate using current selections** is used.*

- **Regenerate copy using the current selections**: generates a new on-demand app using the current selections that have been made within the selection app. The previously generated on-demand app remains in its current state.

Exploring a published on-demand app

Published on-demand apps have a preselected subset of data from a very large data source. You can explore that data through the visualization objects in the on-demand app. In that way, on-demand apps are like apps created with data from any other source. You cannot change them after they have been published, though like other published apps, you can add private sheets and stories if you have the correct access rights.

You work with published on-demand apps the same way you work in other published apps.

7.3 Creating an app

The first thing you need to do when building an app is to create an empty placeholder for it. You create the app placeholder from the hub.

Do the following:

1. Click **Create new app** in the hub.
2. Give your app a name.
3. Click **Create**.
   The app is created.
4. Click **Open app**.
   The app opens in the app overview.

The next step is to add data to the new app.

7.4 Styling an app

You can apply styling to your app to customize the app based on your company standards. The selected styling will be applied to all sheets in the app. Once the app has been published, you cannot change the app styling.

The following styling options are available:

- Changing the direction of the characters in strings of text or numbers
- Changing the default app theme
- Changing the background color for the sheet titles.
- Changing the sheet title font color.
- Adding and aligning a image, such as a logo.

Opening app options

You can open the app options from anywhere in an unpublished app. It does not matter if you are exploring and discovering data, building a data model or working with data storytelling.

Do the following:

- In an unpublished app, click ⋯ and then click ⚙ to open app options.
- Click ⊗ to close the app options.

> *If you are using a mobile device, the app options are not available.*

Changing the reading order

Do the following:

- In an unpublished app, click ⋯ and then click ⚙ to open app options
- Under **Appearance** > **Right-to-left**, select **On** or **Off**.

> *If a visualization is shared using Qlik Sense Charts, changing the reading order in the app will also affect the reading order in the shared chart.*

Changing the default app theme

The app theme can be set to one of the default Qlik themes using the **App Theme** drop-down menu.

The default Qlik themes are:

- **Sense Classic** - Provides a more compact view of objects, and limits the space between them.
- **Sense Focus** - Adjusts the padding and spacing around objects as well as provides designated spaces for titles.

Changing colors

The sheet title background color can be set to a solid color or a gradient of colors by selecting two colors. The sheet title font can only be set to a solid color.

> *If you are using a mobile device, the sheet title background is displayed as one solid color even if two colors has been set.*

When choosing colors, you have the following options:

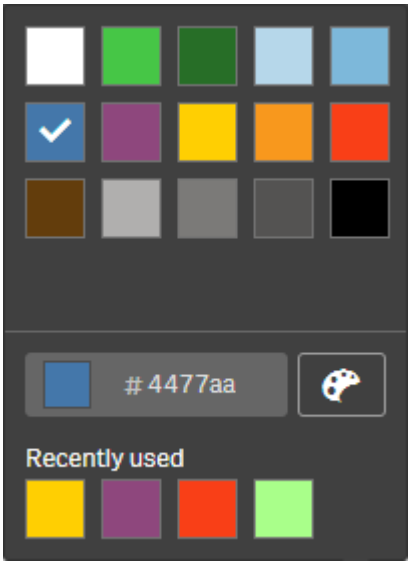
- Choose a color from the default color palette.
- Set a Hex color by typing 6 characters in the # input field.
- Click the palette to show more color options:
    - Click the color wheel to select color.
    - Drag the slider to change the color saturation.

Choosing a color from the default color palette

Do the following:

1. Click ▼ in a color drop-down.
   The dialog opens and displays the default colors.
2. Click one of the colors in the palette.
   The color is selected.
3. Click outside the dialog.
   The dialog is closed.

Now you have set a color by selecting in the default color palette.



The color dialog with the default color palette and no color selected.

Typing a Hex color

Do the following:

1. Click ▼ in a color drop-down.
   The dialog opens and displays the default colors.
2. Type 6 characters in the Hex input field: #.
   The color is selected.
3. Click outside the dialog.
   The dialog is closed.

Now you have set a color by typing the 6 hexadecimal digits.

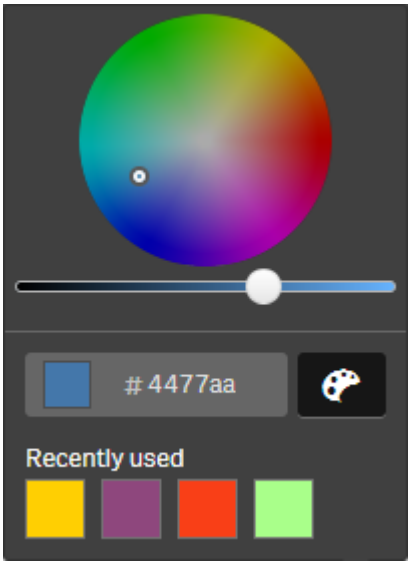
Using the advanced color options

Do the following:

1. Click ▼ in a color drop-down.
   The dialog opens and displays the default colors.
2. Click at the bottom of the dialog.
   The dialog changes and displays the advanced options.
3. Do one of the following:
   - Click in the color wheel.
     The color changes and the Hex color code updates accordingly.
   - Drag the slider.
     The saturation changes and the Hex color code updates accordingly.

   Either way a color is selected.
4. Click outside the dialog.
   The dialog is closed.

Now you have set a color by using the color wheel and/or the slider.



The color dialog with the advanced options and no color selected.

Adding an image

You can add an image to the sheet title, such as a logo. The following formats are supported: .png, .jpg, .jpeg, and .gif.

Do the following:

1. Click the image placeholder next to **Image**.
   The **Media library** opens.
2. Click on a folder in the media library, for example **In app** or **Default**.

3. Select the image that you want to add to the sheet title.
   A preview of the image is shown.
4. Click **Insert**.
   The image is added.
5. Click , or to align the image: left, center or right.

Now you have added an image to the sheet title and selected its alignment.

7.5 Converting a QlikView document into a Qlik Sense app

If you have a QlikView document, you can reuse part of your work in Qlik Sense. The load script and data model can be used to create an app in Qlik Sense. Visualizations, dimensions and measures, however, have to be created in Qlik Sense.

After converting the document to an app, you may need to adapt the load script to be able to reload the script in Qlik Sense. In some cases, you may need to make some changes in the QlikView script before you convert the document.

Qlik Sense provides a tool to help convert a QlikView document (QVW file) to a Qlik Sense app. The tool converts visualizations, dimensions, measures, and variables. You must have access to the Dev Hub To use the QlikView to Qlik Sense converter.

Instructions for how to use the converter tool are provided on the Qlik Sense Developer site.
QlikView converter

If you do not have access to the Dev Hub, you can convert a QlikView document manually.

We recommend that you make changes only in a duplicate of any app that you convert, so that your changes are not overwritten by a later conversion.

7.6 Changing the title and description of an app

You can change the title and description of your apps. When creating a new app, the name of the app is used as its title. When you change the title, the name of the app is not changed.

Do the following:

1. In the app overview, click in the app details area.
2. Edit **Title** and **Description**.
3. Click to stop editing.

The changes you made are saved.

You can only change the title and description of an unpublished app.

7.7 Changing the thumbnail of an app

You can replace the default thumbnail of an app with another thumbnail, to make it easier to distinguish between apps in the hub. You can use one of the default images, or an image of your own.

Do the following:

1. In the app overview, click in the app details area.
2. Click on the default thumbnail.
   The **Media library** opens.
3. Click on a folder in the media library, for example **In app** or **Default**.
4. Select the image you want to use as a thumbnail for the app and click **Insert**.
5. Click to stop editing.

The image you selected is now used as a thumbnail for the app.

The optimal aspect ratio of a thumbnail is 8:5 (width:height).

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You can upload images to the **In app** folder in the media library. You need to use the Qlik Management Console to upload images to the default folder.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

You can only change the thumbnail of an unpublished app.

7.8 Duplicating an app

You can duplicate an existing app, to create a copy to develop further. You can only duplicate an app that you have created yourself.

If you have an admin role, giving you the administration rights needed, you can create duplicates of apps from the QMC.

When you duplicate a published app, only the base sheets and stories will be included in the copy.

Do the following:

- In the hub, long-touch/right-click the app you want to duplicate and select **Duplicate**.
  A toast notification is displayed for a while, at the bottom of the screen, when the duplication starts. A new toast notification will be displayed when the app has been duplicated and give you the possibility to update the app list. If the duplication fails, an error message will be displayed.

A copy of the app is created under **Work**. You can click the app to open it and start adapting it according to your preferences.

Because of how the synchronization of data works in multi-node sites, apps containing images may display broken thumbnails or images inside the apps if opened right after being duplicated or imported. The broken images are restored when the synchronization is complete. To check if the images have been restored, refresh the browser window.

7.9 Deleting an app

You can delete an app that you no longer need.

From the hub, you can only delete apps that you have created and that have not yet been published.

Do the following:

1. Long-touch/right-click the app in the hub and select **Delete**.
   A confirmation dialog opens.
2. Click **Delete**.
   A toast notification is displayed for a while, at the bottom of the screen, when the app is being deleted. If the deletion fails, an error message will be displayed.

You can delete a published app from the Qlik Management Console.

If an app is being deleted by someone else from the stream you are currently viewing, a toast notification will be displayed and give you the possibility to update the app list.

7.10 Uploading image files to media library

The media library contains the images you can use in your app: in text & image visualizations, on story slides, and as thumbnails for apps, sheets, and stories.

You can upload images to the media library. Because of limitations in the web browsers supported by Qlik Sense, it is recommended to keep the height and width as well as the file size of the images as small as possible. The maximum file size is 5 MB. The following formats are supported: .png, .jpg, .jpeg, and .gif.

You can open the media library in several ways. Do one of the following:

- In the app overview, click in the app details area and click on the thumbnail.
- If you are editing a sheet, double-click the text & image visualization to open the editing toolbar and click .
- In storytelling view, click in the story tools panel and drag **Image** onto the slide and then double-click inside the image placeholder.

The **Media library** dialog opens and now you can upload images.

Do the following:

1. Select **Upload media**.
2. Do one of the following:
   - Drop one or more image files onto the designated area.
   - Click the designated area to open the upload dialog, browse and select images, and click **Open**.

   An upload indicator is displayed while the image file is being uploaded. You can cancel an ongoing upload by clicking on on the image.

   You cannot upload a file if its file name already exists in the media library.

Now you have added images to the media library. Click the image and select to insert the image.

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You can upload images to the **In app** folder in the media library. You need to use the Qlik Management Console to upload images to the default folder.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

7.11 Deleting image files from media library

The media library contains the images you can use in your app: in text & image visualizations, on story slides, and as thumbnails for apps, sheets, and stories.

You can delete images from the media library.

You can open the media library in several ways. Do one of the following:

- In the app overview, click in the app details area and click on the thumbnail.
- If you are editing a sheet, double-click the text & image visualization to open the editing toolbar and click .
- In storytelling view, click in the story tools panel and drag **Image** onto the slide and then double-click inside the image placeholder.

The **Media library** dialog opens and now you can delete images.

Delete images using Qlik Sense

Do the following:

1. Select the **In app** folder.
2. Select the file you want to delete.
3. Click .
   A confirmation dialog is displayed.
4. Click **Delete**.

Now you have deleted images from the media library.

*You can also long-touch/right-click on an image file and select **Delete**.*

For Qlik Sense: You need to use the Qlik Management Console to delete images from the default folder, or other folders that were created from the Qlik Management Console.

Delete images using Qlik Sense Desktop

You can delete images from the default folder by removing the files from this location: *<user>\Documents\Qlik\Sense\Content\Default*.

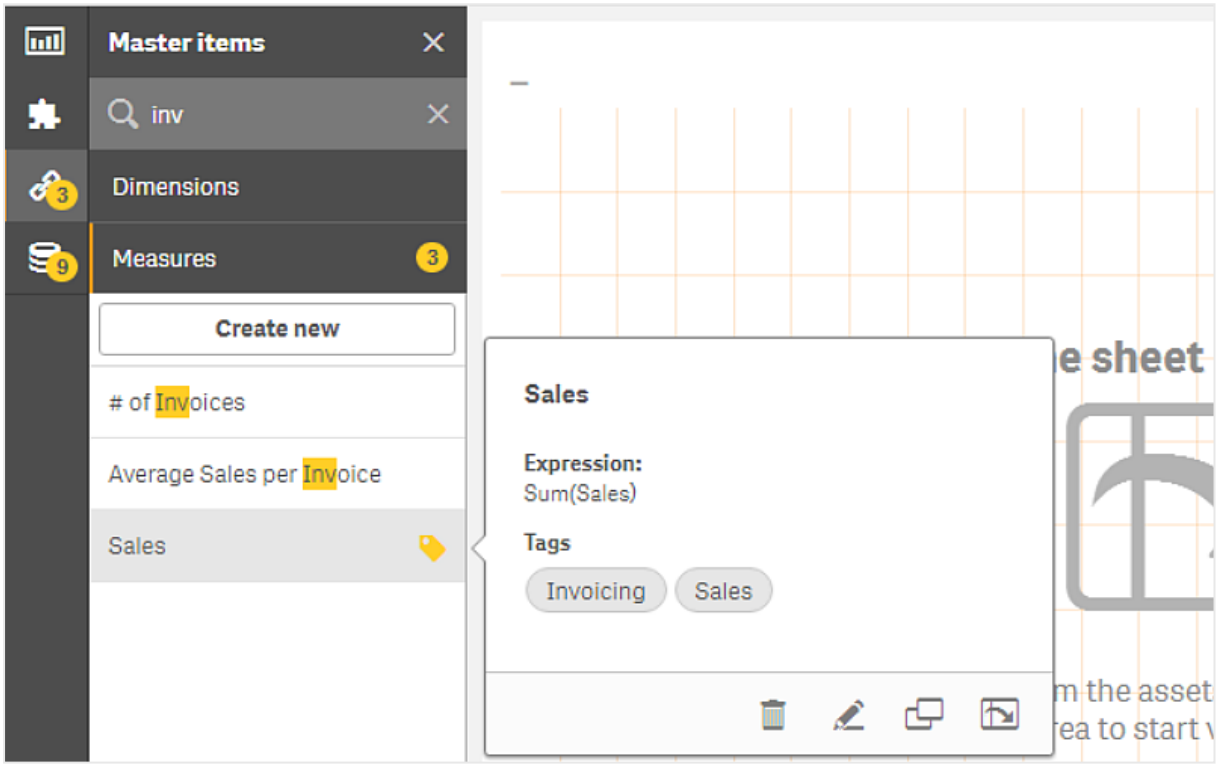
The images in the **In app** folder are bundled images, saved in the qvf file together with the rest of the contents of the app. If a bundled image is no longer used in the app, the image will be deleted from the qvf file when saving the app.

8 Searching in the assets

The search field at the top of the assets panel helps you find assets on the different tabs. As you start to type in the search field, all items that have a name or a tag that contains the search string, are presented.

The search function is not case sensitive.

When a matching string is found in a tag, it is indicated by a tag icon in the search result. Clicking the item in the list of results, brings up a preview of it.



Searching for "inv" among the measures presents any measure that contains that string in its name or a tag.

9 Best practices for visualizations

There are number of different ways you can improve the aesthetics and functionality of your app. Depending on your audience and what data you want to highlight, the way you design your visualization may have a serious impact on the reader's interpretation of the data.

9.1 Adding context to KPIs

KPIs are a great way to communicate some of the big ideas inside your app. However KPI values do not provide any context to the number and calculations that are happening behind the scenes. A green light next to a KPI does not tell the reader if the goal was barely achieved or if you greatly surpassed it.

To help bring context to your KPIs, include supporting information next to the value in smaller text. For example, you can compare the current KPI value with the value from the previous year. You can also add a small chart (line or bar) without axes or values to provide information about the current trend.

See: *KPI properties (page 98)*

9.2 Color accessibility

The spectrum of colors is narrower for people who have some type of color-based visual impairment and so they may interpret your visualization differently.

For example, some people see the colors red and green more as yellow or brown. This form of red-green color vision deficiency is the most common. This is worth noting since red often carries a negative connotation in data visualizations, especially in finance.

A red or green KPI status can be confusing. You can use shapes with colors as performance indicators to make your designs more accessible. For example, use a red empty circle to denote bad and a green full circle for good or add a triangle as a warning symbol that only appears when a KPI status is at an unacceptable level.

Lines, bars, and pie slices can be difficult to distinguish when the colors are distorted. Use different line styles with different colors to help improve the clarity of your charts.

See: *Change the appearance of a visualization (page 218)*

9.3 Filter and icon placement

Filers and icons are an essential part of data visualization but it can be difficult to know where to place them or what information to put first. You can often anticipate where the user will begin to read and what information will read first based on a few well-established design principles.

Left placement

Several popular websites use left side navigation tiles and filters. This is due to the fact that many languages read from left to right and as a result the left side of the screen is where these readers look most frequently. Alternately, with languages where text is written right to left, the opposite of this is true. User who are scanning for content tend to gravitate toward the left side of the screen. The farther to the right objects are, the less users will look at them. If all your filters and icons are stacked vertically on the left, it gives them equal weight.

Top placement

Another common placement option for icons and filters is along the top of an app. By not placing filters or icons on the left it gives more space for larger visualizations with distracting menus. When filters and icons are placed above visualization they are also seen as separate from the content below. This can help show the reader that you are prioritizing the filters or icon. If all your filter and icon are side-by-side at the top, the one furthest to the left carries more weight and is a prioritized by the reader.

See: *Copying, replacing and moving items on sheets (page 20)*

9.4 Information hierarchy

When not all of your information is equally important, you want your reader to prioritize some visualizations over others. You can show a hierarchy of information by using a few key design best practices. For example, you can use different sizes to emphasize some visualizations. Larger information is seen as more important, by increasing the font or chart size you can show the reader where to look first.

See: *Resizing a visualization (page 256)*

Page placement also plays a part in information hierarchy. The information at the top of a page is perceived as more important than information at the bottom of the page because it is read first. Information on the first page is perceived as more important than information on the last page.

9.5 De-cluttering your apps

Too much information in an app makes it difficult to see what is important. Today's modern user interface style is a cleaner, simpler, flatter style of design. A simplified design subtly guides the reader and allows them to stay focused.

Less is more

Users often try to include too much information in one app. Line charts with several measures can be confusing and difficult to interpret. Try creating several smaller apps to spread this information out onto the page. It also allows the reader to efficiently compare and contrast visualization that are side-by-side. You can also use alternative dimensions and measures to allow the reader to quickly switch between measures without overcrowding a visualization.

See: *Adding alternative dimensions and measures (page 249)*

10 Troubleshooting - Creating apps and visualizations

This section describes problems that can occur when creating apps and visualizations in Qlik Sense.

10.1 Images are not included in the app

Images are part of apps as thumbnails of the apps, sheets and stories, in the text & image object and in story slides.

When you move apps between Qlik Sense environments, images are not moved automatically. The images have to be handled manually, in different ways depending on between which environments the app has been moved.

The app has been moved from one Qlik Sense environment to another

Possible cause

You have created an app in Qlik Sense and moved the app to another Qlik Sense environment.

Proposed action

Import the images from the Qlik Sense environment where the app was created to the target location using the Qlik Management Console.

The app has been imported from Qlik Sense Desktop to Qlik Sense

Possible cause

You have created an app in Qlik Sense Desktop and imported the app to Qlik Sense.

Proposed action

Import the images from the images folder of the Qlik Sense Desktop app using the Qlik Management Console.

Images are included automatically only when you move an app from one Qlik Sense Desktop installation to another.

The default location of the images in Qlik Sense Desktop is *<user>\Documents\Qlik\Sense\Content\Default*.

If you have organized images in subfolders in the Content\Default folder in Qlik Sense Desktop, these have to be added manually to the app and its sheets, stories and text & image objects after importing the images.

The app has been moved from one Qlik Sense Desktop installation to another

Possible cause

You have moved an app between Qlik Sense Desktop installations.

Proposed action

Do the following:

- Copy the images from the PC where the app was created and paste into the images folder of the target location.

The default location of the images in Qlik Sense Desktop is *<user>\Documents\Qlik\Sense\Content\Default*.

10.2 The image I want to use does not seem to work

Images are part of apps as thumbnails of the apps, sheets and stories, in the text & image object and in story slides.

Possible cause

You are using an image in a format that is not supported.

Proposed action

Do the following:

- Convert the image to one of the supported formats (png, jpg, jpeg or gif).

10.3 I cannot find the fields in the assets panel

I can find **Charts** and **Master items** in the assets panel, but not **Fields**.

Possible cause

You are working with a published app. Some content is not available in the assets panel in a published app.

10.4 I cannot open my QlikView document in Qlik Sense

If you have a QlikView document, you can reuse part of your work in Qlik Sense. The load script and data model can be used to create an app in Qlik Sense. Visualizations, dimensions and measures, however, have to be created in Qlik Sense.

Possible cause

The QlikView document (qvw format) has not been converted to a Qlik Sense app (qvf format).

Proposed action

Convert the document to an app using Qlik Sense Desktop.

10.5 I cannot edit a variable

I cannot edit a variable that is listed in the variables overview.

Possible cause

The variable is defined in the script.

Proposed action

Edit the variable in the script, using the data load editor, or delete the variable from the script, using the data load editor, to make the variable editable from the variables overview.

10.6 QlikView variables are missing in the app

My QlikView document contains variables. I have converted the QlikView document into an app, using Qlik Sense version 2.1+. When I open the app in a Qlik Sense version prior to 2.1, I cannot find the user defined variables.

Possible cause

The user defined variables have been removed from the app. This can occur in the following scenario:

1. Create an app from the QlikView document, using Qlik Sense version 2.1+.
   Both the user defined variables and the variables created in the script are listed in the variables overview. An icon indicates if the variable is defined in the script: .
2. Reload the app.
   The script is reloaded. If a variable has been removed from the script it will stay in the app, and be listed in the variables overview, but the script icon ( ) is removed.
3. Open the app, in a Qlik Sense version prior to 2.1.
   Now, the variables that were user defined in the original QlikView document are removed. Only the variables defined in the script stays in the app and you can only work with the variables using the script.

Proposed action

Use Qlik Sense, version 2.1+, to be able to use all variables in the original QlikView document; both script defined and user defined variables.

Only work with variables in the script, if you are a using a Qlik Sense version prior to 2.1.

10.7 I cannot edit a variable that was created in a Qlik Sense installation prior to version 2.1

My Qlik Sense app contains variables and now I cannot edit them.

Possible cause

The variable is defined as a script variable but has been removed from the script. This can occur in the following scenario:

1. Create a Qlik Sense app with a script variable, in a Qlik Sense installation prior to version 2.1.
2. Delete the variable from the script.
   The variable is removed from the script but stays in the app.
3. Open the app, in a Qlik Sense installation version 2.1+.
   Now you see the variable in the variables overview. This icon indicates that the variable is defined in the script: . But you cannot edit the variable since it is not showing in the script.

Proposed action

Reload the script to make the variable editable from the variables overview. The script icon is removed.

10.8 Error message: The hypercube results are too large

When I open a sheet, the error message **The hypercube results are too large** is displayed on an object.

Possible cause

Limit on the size of response to prevent a non responsive engine\browser when handling large data sets.

Proposed action

Limit active data selection set.

10.9 My chart is not sorted correctly

I set my chart to sort automatically on the dimension, but the results are not sorted correctly.

Possible cause

The dimension is an expression with a result that has a different data type than the data fields used in the expression.

Proposed action

Change sorting of the dimension to **Custom**, and select a sorting option that matches the result of the expression. For example, if your expression concatenates two fields to a string, like `Month(salesDate)&'/'&Day(salesdate)`, select to sort alphabetically.

10.10 My calendar measures display incorrect aggregations in visualizations

When I use my calendar measures in visualizations, I see incorrect aggregation results. For example, calendar measures created from identical fields and aggregations but different time ranges may display identical totals.

Possible cause

The table containing the aggregated field is not associated to the table containing the date field, preventing accurate aggregation of the field by the selected time ranges.

Proposed action

Create an association between the table containing the aggregated field and the table containing the date field. If there is no association possible, in **Data manager**, add a table that includes a date field that has an association to the table containing the aggregated field.

10.11 There are no time ranges to select in **Create calendar measures**

When I have a date field selected in the **Create calendar measures** dialog try to create calendar measures from a field, there are no time ranges to select in the **Create calendar measures** dialog.

Possible cause

The selected date field does not have the correct time flags to work with calendar measures. If you have no valid date fields, you cannot create calendar measures. If you have at least one valid date field, all date fields will be available in **Date field**. However, only those with the correct time flags set in autoCalendar enable the selection of time ranges from the Time Range drop-down list.

Proposed action

Select a date field that uses autoCalendar. If you are unsure which calendar is associated to your date field, date fields in the **Field** section of the **Assets** panel display which calendar it uses when clicked.

10.12 My date field selected for calendar measures does not use the correct calendar

I have two calendars to which I have manually added time flags. My time flags have the same names as those in autoCalendar, making both qualified for use with calendar measures. However, only one of my calendars has the same definition for the time flags as autoCalendar. I have a date field associated to both calendars . When I try to create calendar measures using that date field, the calendar with the correct names but different definitions than autoCalendar is used.

Possible cause

In cases where a date field is associated to multiple calendars and each calendar has the correctly named time flags set in it, calendar measures uses the first qualified calendars defined in your data load script.

Proposed action

Move the script section containing the calendar you want to use with calendar measures before other qualified calendars in your data load script.