

OssCharts User/Set-Up Guide

Please refer to the following documents for further information:

- N/A

Subject: OssCharts User/Set-Up Guide
 Manufacturer: OneSight Solutions
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 Software Version: Tridium niagara N4

Document Control

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1. Introduction

OssCharts is a Niagara 4 module which provides a range of history chart widgets and point gauges for use in station graphics. The widgets are built using modern web technologies such as HTML 5 and Scalable Vector Graphics meaning they can be scaled to fit a wide variety of display sizes and ratios.

2. Installation

To install OssCharts you will need to put the Java module 'OssGraphs-ux' into your workbench modules folder and/or station modules folder **and restart workbench/station**. This guide assumes the user is familiar with Tridium Niagara 4 engineering, for further help with installing modules please refer to the Tridium N4 help files.

OssCharts requires a license to be purchased from OneSight Solutions. You will need to install the OneSightSolutions.license and associated certificate before the module will run. Please contact OneSight Solutions at info@onesight.solutions for licensing requirements and software downloads.

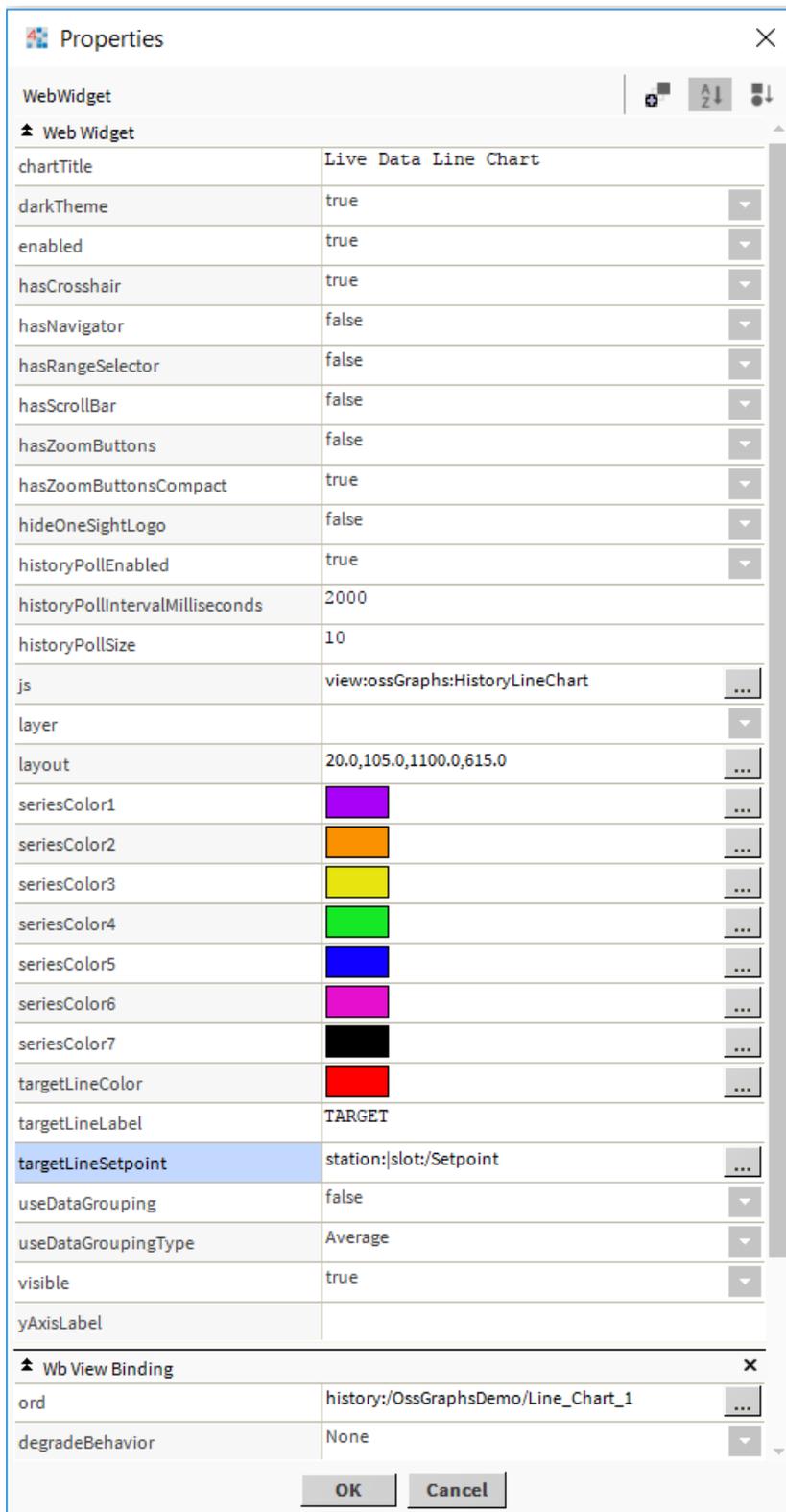
3. Getting Started

Once the software is installed a new palette called OssGraphs will be available in workbench. This contains History Charts which are used to display charts showing Niagara Histories, Single Point Charts which are gauges designed to display the current value of Numeric Points, and Multi Point Charts such as Pie Charts, which compare live values from several Numeric Points.

Chart widgets can be dragged from the palette onto px pages, and then configured by using their property sheet. Widgets of the same type (History Chart/Single Point/Multi-Point) tend to have common properties, so we will discuss these by category and then point out features that are individual to each chart in that category.

4. History Charts

Before a history chart will display any information you will need to configure it, providing the ords of the history/histories to be displayed, and selecting your preferences with regards to color scheme, navigation options and optional or chart specific features. Double clicking the widget will display a property sheet (see figure 1).



(Figure 1)

4.1. Adding History Data

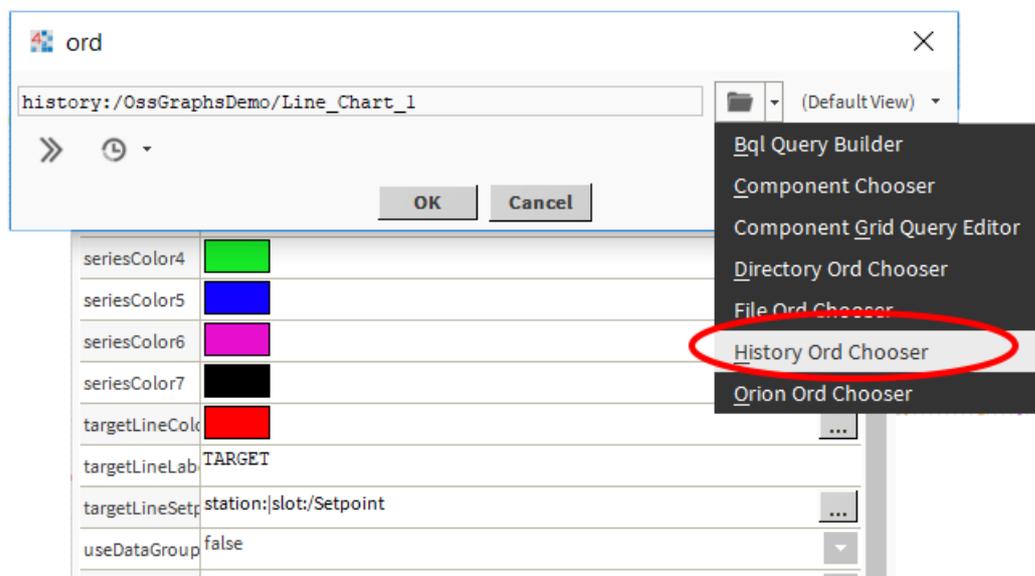
History charts can display data from multiple histories on the same chart. When you drag a new history chart onto a px page you will see on it's property sheet that there is a WB View Binding at the bottom. The ord property of the view binding will need to point to the history that you wish to display.

Click the ellipses button on the ord property to choose which history should be added to the chart (Figure 2).



(Figure 2)

Click the small down arrow on the folder button. For history charts you will need to select the History Ord Chooser from the list

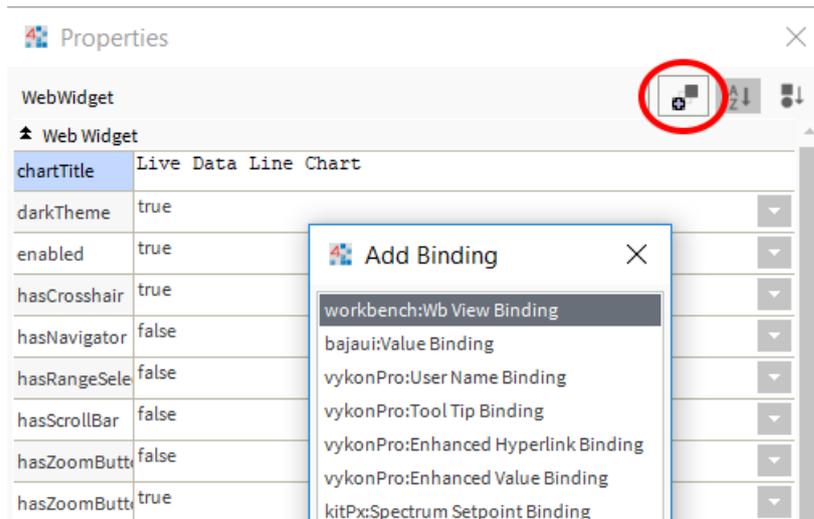


(Figure 3)

Select the history that you wish to display from the station History space.

4.2. Adding Additional Histories

Each history you wish to display will need a WB View Binding on the widget's property sheet. To add a new binding click the 'Add Binding' Button at the top right of the property sheet (Figure 4).



(Figure 4)

Select workbench:Wb View Binding and click OK to add a new view binding to the property sheet. You may need to drag the bottom border of the property sheet down to make it a bit bigger to see the new view binding.

4.3. Using Appropriate Histories

In order to get the best results, you may wish to create history files to suit your charts. Some charts such as the line chart do a good job displaying large histories with lots of data. Other chart types such as the bar chart look best when the data set displayed is much smaller.

Consider creating additional histories with appropriate lengths and intervals to suit the graphs you wish to display. For example if you want to display the most recent week's worth of data and your history contains a year's worth of data, creating an additional history with a shorter record count could produce better results on some chart types.

4.4. History Chart Properties

The following table lists all the common properties of the history chart. Some charts may not have every feature on the list, but the properties that follow are common to several or all history charts. Where a feature requires a longer explanation it will be discussed in more detail below.

Property Name	Description
chartTitle	Text to display for the main title which appears at the top of the chart.
darkTheme	OssCharts has two color schemes. Light theme is a white background with appropriate colors applied on titles, axis markings grid lines etc. Use this property to switch to a dark background, with silver labels and axis etc.

enabled	If you disable the chart it will not load. This can be useful if you do not want to delete a chart and lose all the configuration information, but you want to temporarily stop it from loading while you are working on some other element of the page.
hasCrossHair	Charts have horizontal lines showing y-Axis intervals as guidelines. If you would like an additional vertical line which follows the mouse pointer and draws down to show where exactly the mouse is on the x-axis enable this property.
hasNavigator	Turn the Navigator on/off. See Navigation Features section below
hasRangeSelector	Turn the range selector on/off. See Navigation Features section below
hasScrollBar	Turn the scrollbar on/off. See Navigation Features section below
hasZoomButtons	Enable Zoom buttons (either compact or extended). See Navigation Features section below
hasZoomButtonsCompact	If Zoom buttons are enabled switch between compact/extended. See Navigation Features section below
hideOneSightLogo	The Onesight Solutions logo at the top right of the chart can be replaced with a standard menu icon if preferred.
historyPollEnabled	See History Polling Section below
historyPollIntervalMilliseconds	See History Polling Section below
historyPollSize	See History Polling Section below
js	The chart type – this will be set by the editor when you drop a chart onto the page. If you wish to convert to using a different chart type you can change it here to carry over view bindings, property settings and layout.
layer	The px layer the chart is on
layout	Standard layout properties, x position, y position height & width of the chart widget. History charts will maintain a 16:9 ratio regardless of the proportions of the widget.
seriesColor1-7	Colors to use for each series. A series is the name given to all the data from one Niagara history. So on a line chart each series will be a line, on a scatter chart each is a set of plots etc.
showDeltaButton	See the Show Delta Button section below
targetLineColor	If we have a target line this is the color used for the line and the label. See 'Target Line' section below

targetLineLabel	If we have a target Line this is the text it should be labelled with. See 'Target Line' section below
targetLineSetpoint	See 'Target Line' section below
visible	Show/hide the widget on the px page
yAxisLabel	Label Text for the y-Axis

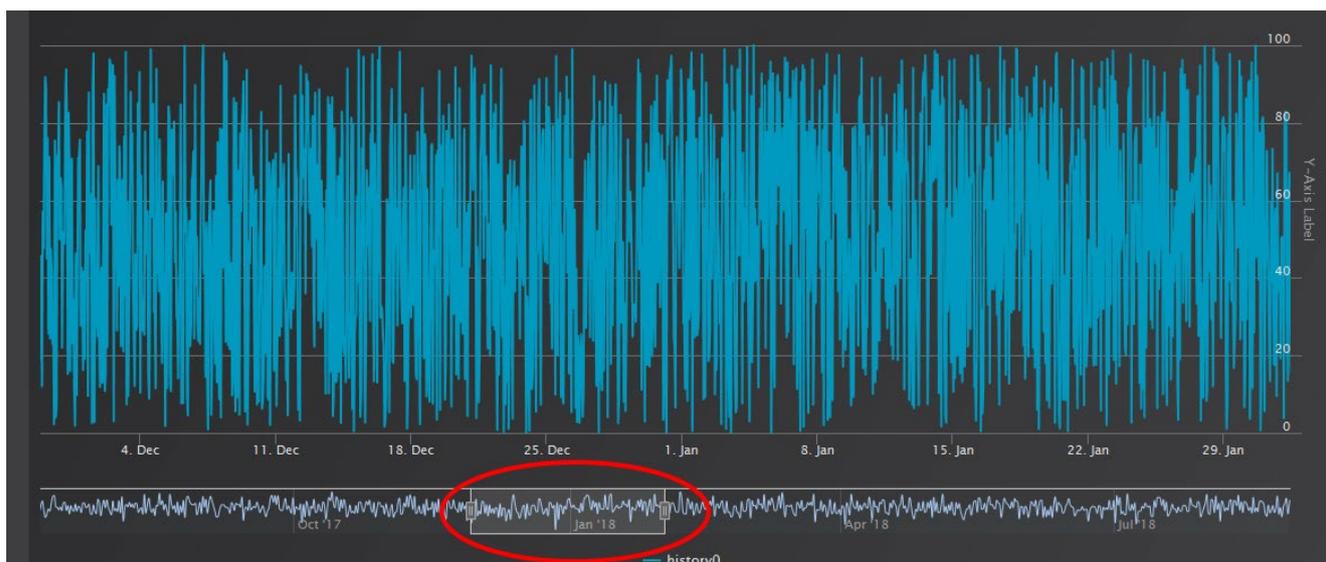
4.5. Navigation Features

Once you have data on a graph you may want to examine it in more detail - changing the zoom level or the range of data displayed. By default history charts will allow the mouse to drag-to-zoom, and provide a button to reset the zoom when zoomed in. On a touch screen you can pinch/stretch to zoom using two fingers, and pan using one finger.

OssCharts has several optional features for advanced navigation, which can be useful in different situations. The size of the chart, the data it is displaying and the screen size(s) you expect it to be viewed on will affect which you choose to use. Some work together well as a combination, and all can be switched on/off individually.

4.5.1. Navigator

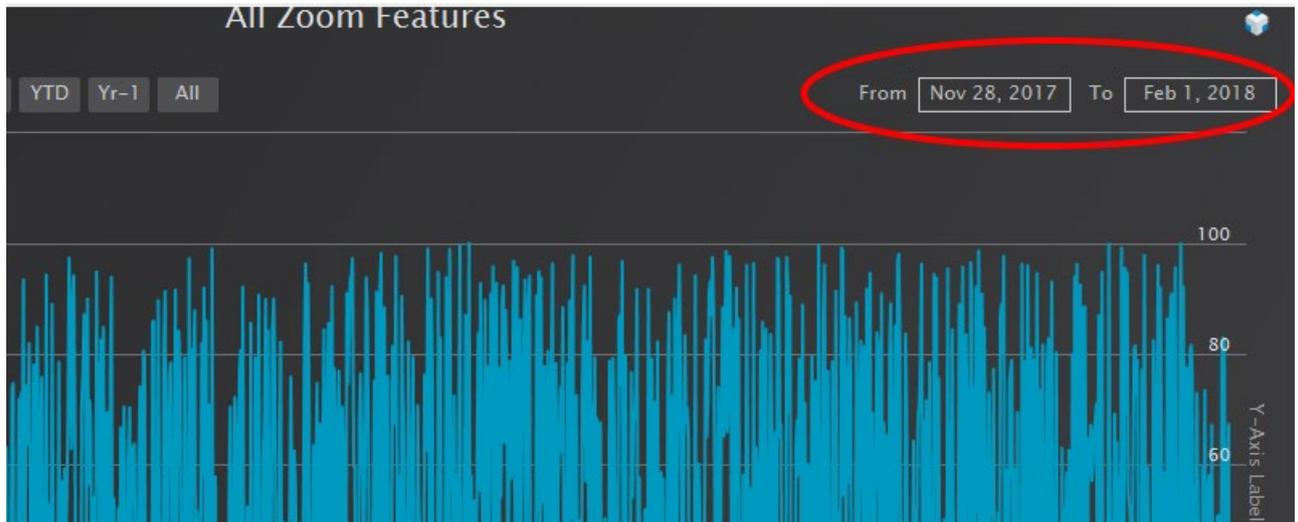
The Navigator view is an overview of the whole chart which stays at the bottom of the main chart regardless of the zoom level. It has a slider which can be resized, and moved around which defines what is visible in the main chart view.



(Figure 5)

4.5.2. Range Selector

The range selector allows you to enter a date range to zoom to a specific date range. Enter a from and to date, and the view will resize to show the relevant data. This feature will interact with other optional features such as the scroll bar, and update the range values to reflect what is visible as you slide.



(Figure 6)

4.5.3. Scroll Bar

Enable the scroll bar property to get a horizontal scroll bar at the bottom of the chart. The scroll bar works well in combination with other navigation features (although it is a bit redundant if you have the navigator view enabled). If you have the default drag mouse to zoom it provides a way to pan left or right without changing the zoom level. It also work's well with both sets of zoom buttons.

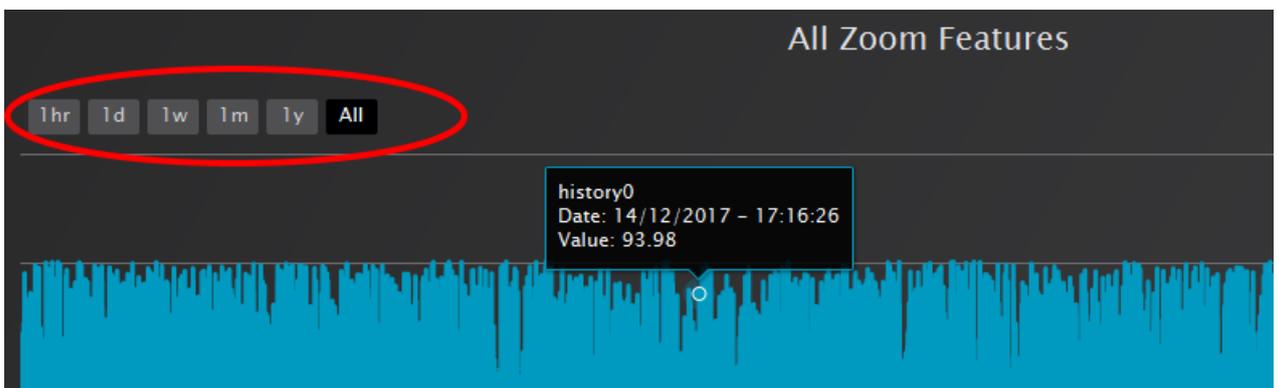


(Figure 7)

4.5.4. Zoom Buttons

Zoom buttons let you jump to preset zoom levels or ranges quickly. Turning this property on will put a set of buttons in the top left of the chart. There are two sets of buttons available, the extended set which mirror the options on Tridiums own charts (today, last 24 hours, yesterday, 7 days, last week, week to date, month to date, last month, year to date, last year, all) and the compact set (1 hour, 1 day, 1 week, 1 month, 1 year, all). Use the hasZoomButtonsCompact property to switch between the two.

The compact set are useful if space for the chart is limited, and other page elements are taking up a lot of room. The buttons have been kept small on purpose to take up less room, so they may not be the best choice for touch screen, where pinch to zoom is a better option.



(Figure 8)

4.6. History Polling

History charts by default will be re-drawn when you refresh the page to display any new information that may have been logged since the last page refresh. In many situations this may be the best choice, as it minimises required system resources, and means the data will not move while you are looking at it. In some circumstances you may prefer to have the data updating automatically, showing new information as it arrives.

History Poll Enabled turns live updates on or off. Two other properties, 'history poll interval milliseconds' and 'history poll size' can be configured to suit the data being displayed.

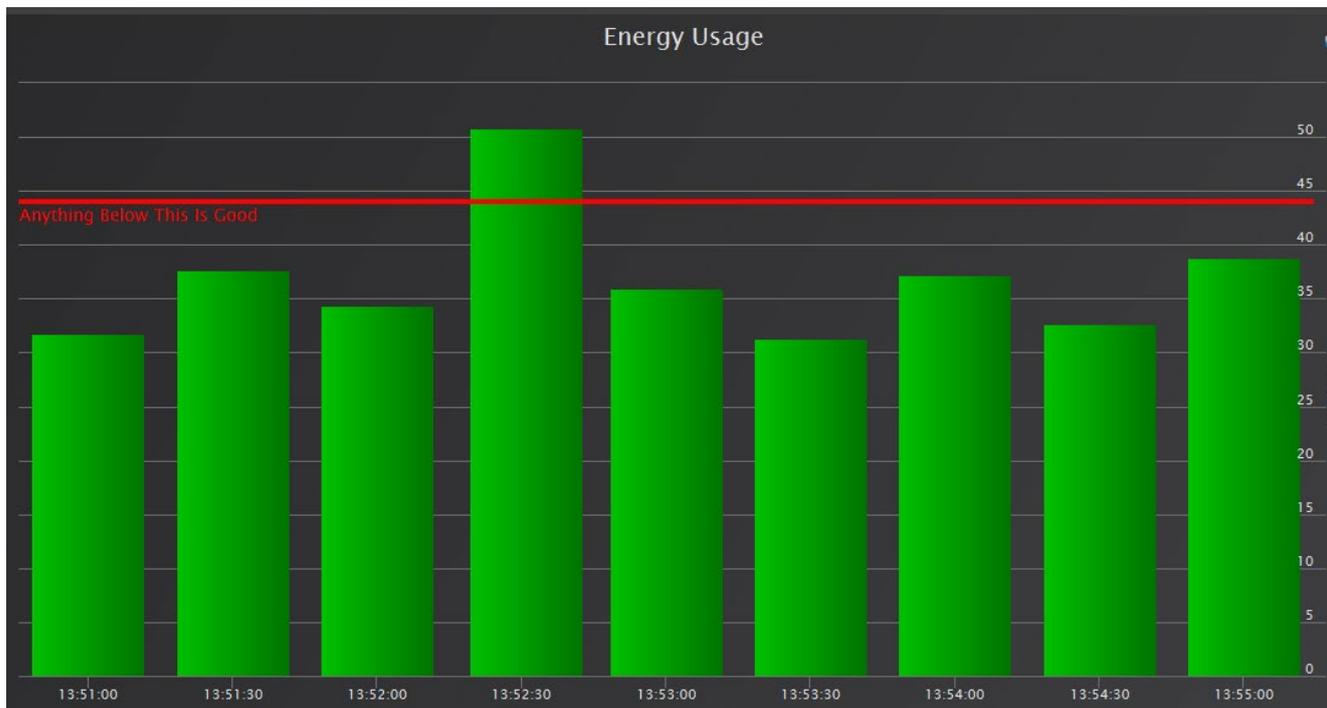
History poll interval is the number of milliseconds to wait between re-checking the history(s) for new data. If you have rapidly updating data you may need to set this to check every few seconds, but for most purposes it can be set quite high (if you have a 15 min interval history there is little point checking more frequently than this).

The history poll size is the number of records to retrieve at each poll. If you have a history poll size of 10, then the ten most recent records will be retrieved from each history on the chart at every poll. This is done to minimise the system resources required, as retrieving and processing thousands of history records every few seconds would be an unnecessary burden on the system.

If you set this too low with a long poll interval on a rapidly updating history you could miss some data, resulting in the missing records not being charted. If you set it too high, you are putting extra strain on system resources and getting nothing in return. Generally speaking you should not need to adjust this, and unless you are sure on exactly what to change it is best not to change it.

4.7. Target Line

The target line is an optional property which draws a horizontal line on a chart to represent the desired value, a limit we shouldn't cross or some other significant value.



(Figure 9)

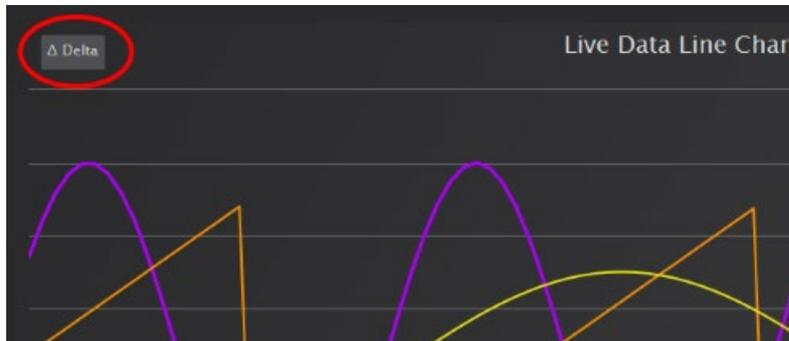
You can customise the label and the colour depending on what you wish to show using the target line colour and target line label properties.

To enable the target line you need to provide an ord pointing to a setpoint in the target line setpoint property. If you wish to have a fixed setpoint, you can make a numeric writable and set the value, then provide this as the setpoint for the target line.

Using an ord instead of simply entering a numeric value (which will not work) allows for a setpoint that is calculated and can change over time.

4.8. Show Delta Button

If this property is enabled a button to switch the chart to delta mode will be shown in the top left corner of the chart. Delta mode shows the change in values as opposed to actual values. This is particularly useful when showing data from an energy meter, or other data source that shows a running total.



(Figure 10)

When you switch a chart to delta mode it will pause history polling. You can refresh the page once you have finished viewing the delta values to resume live update.

Please note that delta mode is not compatible with data grouping (see below).

5. Chart Specific Features

5.1. Line Chart

5.1.1. Data Grouping

Data grouping is an optional feature on the line chart that can be configured. It is used automatically on some other charts such as stacked area, but is not configurable on these as they would not work properly without it.

On the line chart data grouping is useful if you have a lot of data and would like to simplify the view. Consider a years worth of data, that is logged every ten minutes. If you display this as a line chart, you will have so many points on the chart that it's hard to see anything useful when zoomed right out. One year at ten minute intervals is more than 50,000 points of data.

Data grouping can make it easy to see trends in data such as this, by simplifying the view. In this example, a more helpful way to display this would be to take an average for each hour which would result in 8,760 records. Plotting these averaged points will make it a lot easier to see trends.

It is important to realise that the chart still has all the data, it is just simplifying the view, so when you start zooming in the data grouping will allow you to see all the detail.

Data grouping will automatically pick an appropriate group size. Data can be grouped by second, minute, hour, day, week, month or year.

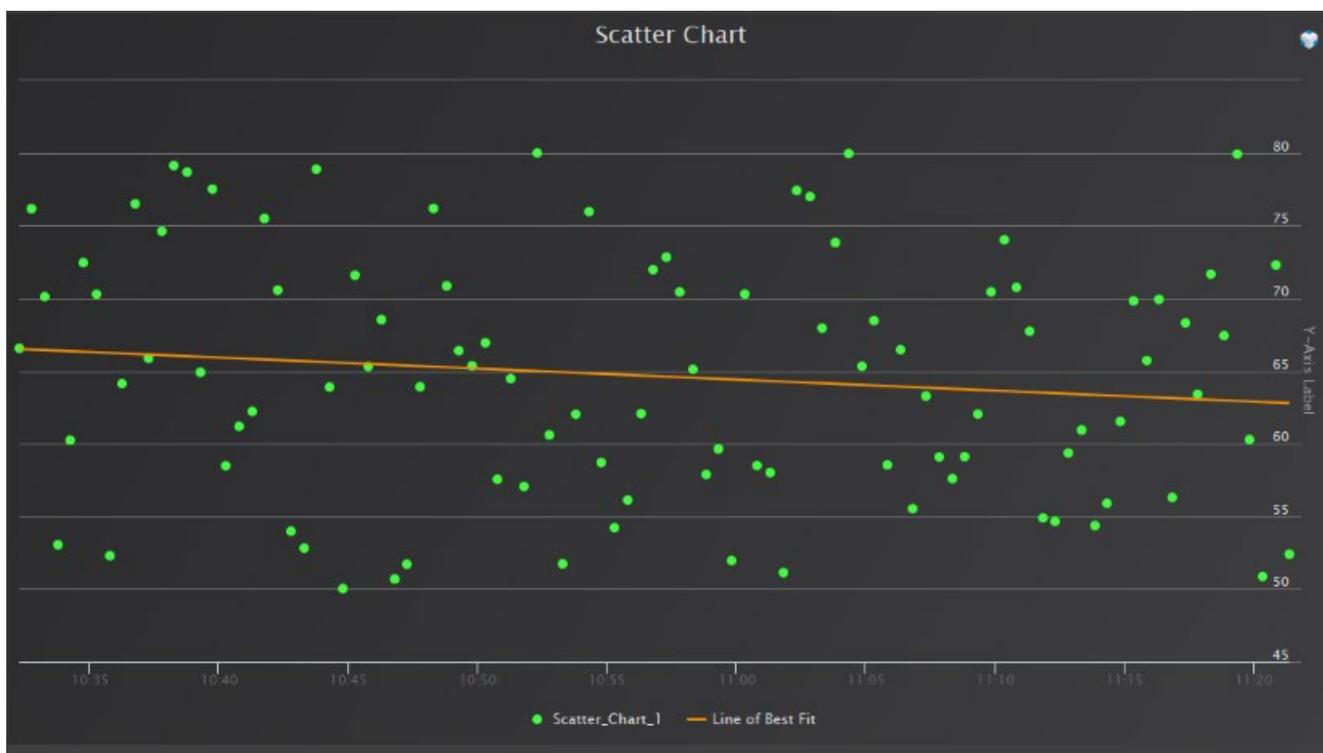
In addition to being able to turn data grouping on or off, you can also choose a **data grouping type**. The default type of data grouping to use is average, as this makes sense for most applications. You can change this to be low, high or sum. So instead of averaging the days in the previous example, we would plot the highest value for the day, the lowest value for the day, or the sum of all values for the day.

Data grouping will prevent delta mode from working, so please ensure data grouping is switched off on charts with a delta mode button enabled.

5.2. Scatter Chart

5.2.1. Primary Series Trend Line

An optional feature on the scatter chart is to draw a line of best fit through the data of the first series. The line's coordinates are calculated using a mathematical process known as least squares linear regression. This is the most common way of calculating a line of best fit, but it is not suitable for all sets of data. It should be noted that in these cases the line may not fit the data properly – this is especially true when you have one or more points that deviate substantially from the norm.



(Figure 11)

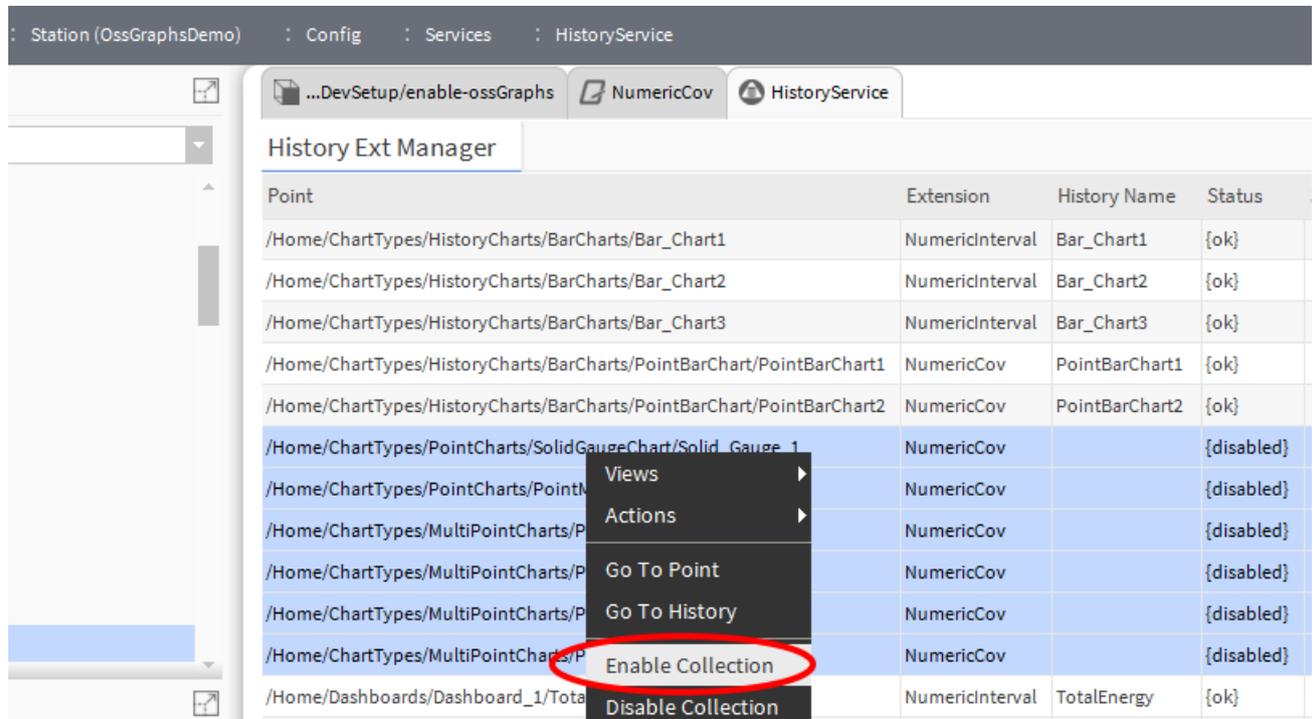
5.2.2. Enable Animation

When attempting to chart a large amount of data the scatter chart can sometimes take a long time to load. In order to improve performance this property disables chart animation, which significantly improves loading time.

5.3. Stacked Area Chart

5.3.1. Setup

Stacked area chart requires that the histories being displayed have consistent timestamps. The recommended way of setting this up is to add a Numeric Interval History Extension to each point you plan on including, and to ensure that the record count and interval are identical on each one. You can then enable all of them simultaneously from the history service by highlighting them all, and selecting 'enable collection' from the right click menu.



(Figure 12)

Failure to follow these steps will result in the data not being correctly displayed.

5.4. Bar Chart

5.4.1. Setup

Bar charts look best when displaying smaller sets of data. When using the bar chart you may need to create new histories with appropriate lengths and intervals to suit the data you wish to display.

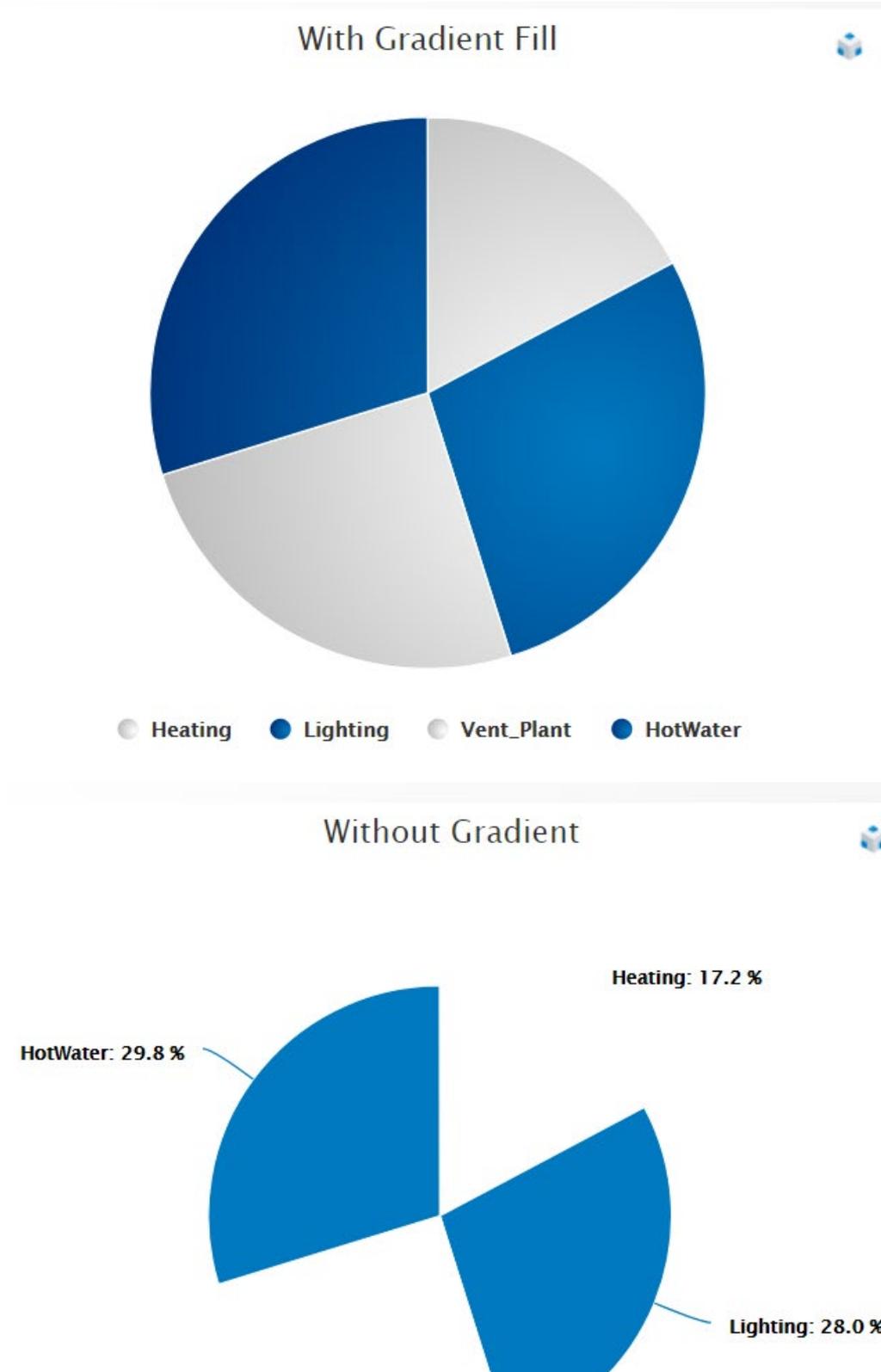
For example, if you want to display the most recent week's worth of data and your existing history contains a year's worth of data, creating an additional history with a shorter record count could produce better results.

5.4.2. Point Padding

This property sets the amount of space that surrounds each bar. The default 0.1 is suitable for most applications, increasing this will result in wider gaps between bars, while lowering it will cause the bars to touch.

5.5. Gradient Charts

'Gradient' versions of a chart function exactly the same as the non-gradient version, the only difference is how they are coloured in. On a gradient chart the colours are faded in giving a 3D appearance. The two charts below both have the same series colours.



(Figure 13)

5.6. Stacked Bar Chart

5.6.1. Setup

Stacked bar charts work best for displaying small amounts of data that have common timestamps. The recommended way of setting this up is to add a Numeric Interval History Extension to each point you plan on including, and to ensure that the record count and interval are identical on each one. You can then enable all of them simultaneously from the history service by highlighting them all, and selecting 'enable collection' from the right click menu.

The chart will still work with data that does not have matching timestamps, but 'stacking' will only occur at points where the timestamp matches.



(Figure 14)

5.6.2. Column Labels

Set this property to true to display a total at the top of each stack (as in Figure 14).

5.6.3. Column Part Labels

Set this property to true to display a label showing the value of each section of the stack.

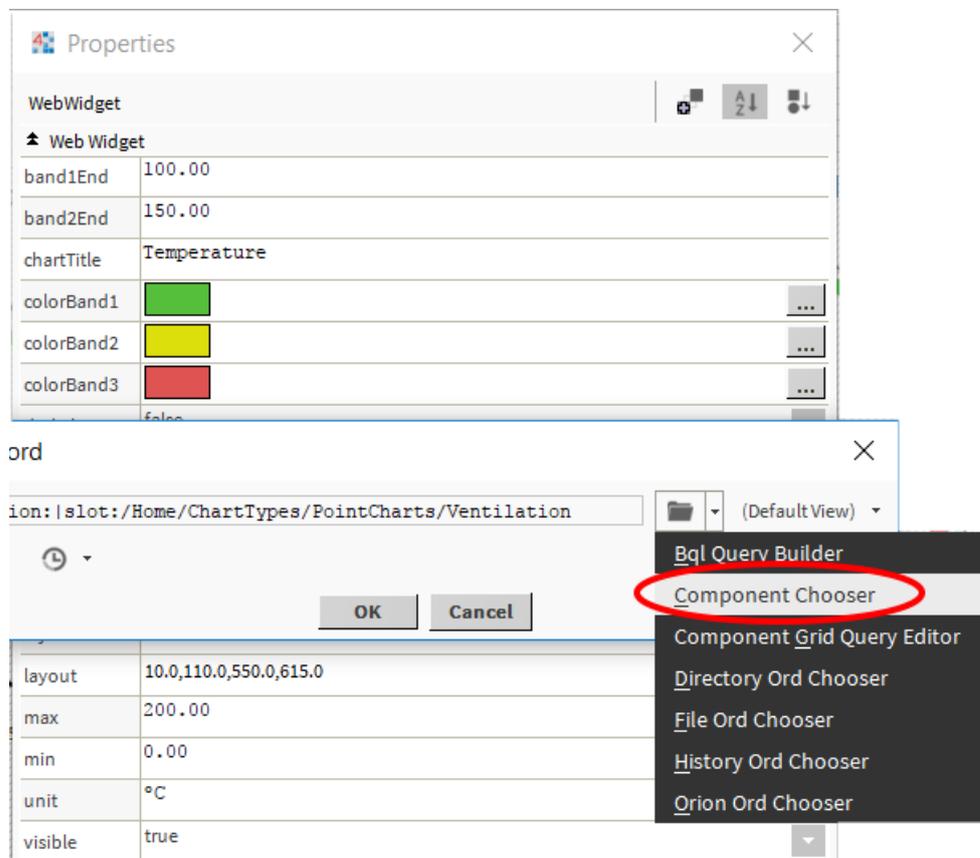
5.6.4. Point padding

This property sets the amount of space that surrounds each bar. The default 0.1 is suitable for most applications, increasing this will result in wider gaps between bars, while lowering it will cause the bars to touch.

6. Point Charts & Multi-Point charts

Point charts are used to display live point values as opposed to history data. Before they will display any data you will need to enter an ord into the WB View binding, and configure the properties with your desired options. Drag a point chart from the palette onto the px page, and double click it to display the property sheet. Most of the properties are either the same as the history chart, or specific to the specific type of point/multi-point chart.

Similarly to history charts you will need to set the ord of the WB View Binding to a valid numeric point ord for the chart to function. Instead of using the history ord chooser on the dialogue **you will need to use the component ord chooser.**



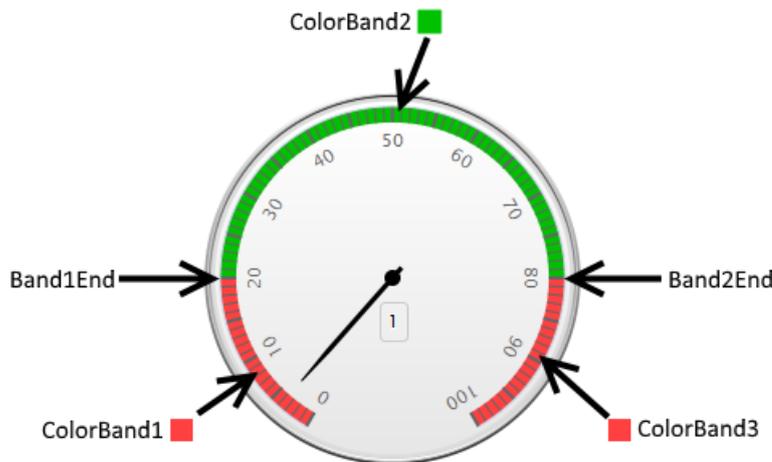
(Figure 15)

7. Chart Specific Features

7.1. Point Gauge Chart

7.1.1. Band1 End, Band2 End, Colour Bands 1, 2 & 3

These properties define the end points and colours for the bezel/chart-axis. The picture below (Figure 16) shows what each property relates to.



(Figure 16)

7.1.2. Decimal Places

Sets the number of decimal places shown on the numeric display below the needle on the gauge. You will need to make sure the facets on your point are also set correctly.

7.1.3. Max & Min

Sets the upper and lower limits on the chart.

7.1.4. Correctly setting limits

It is possible to set values on all of these properties which make no sense, such as putting the max at 100 and Band2End at 150. If your chart is not displaying correctly check these values.

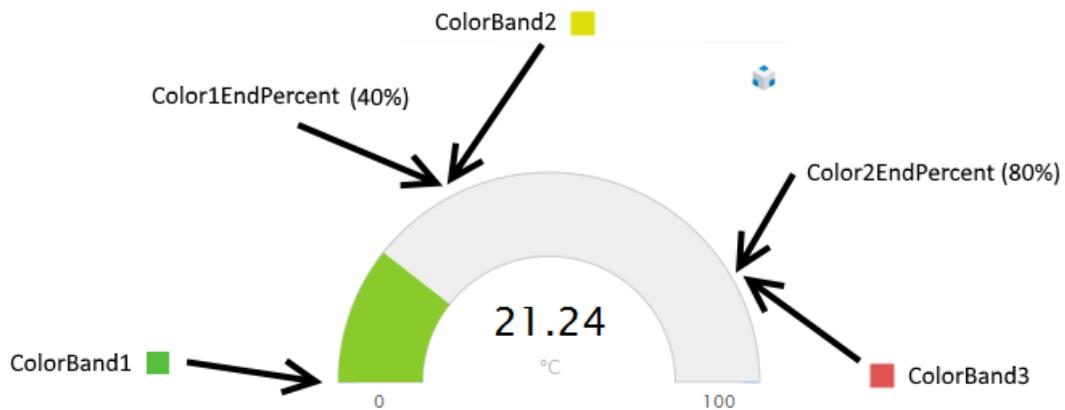
If the point value goes past the limit, the needle will just continue round. For example a value of two hundred on a chart that only goes to 100 would result in the needle going completely round twice.

7.2. Solid Gauge

7.2.1. Color1EndPercent, Color2EndPercent, ColorBand1, 2,& 3

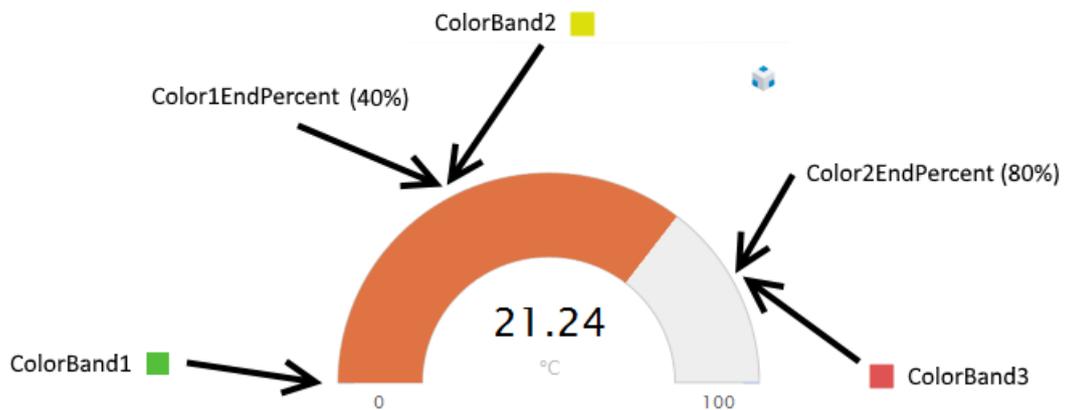
The solid gauge chart changes colour to reflect the value that is being displayed. This colour transition is gradual, not sudden. A value at the minimum end of the scale will be shown in colourBand1 colour. As the value rises towards the percent value set by Color1EndPercent the first colour will transition into the second colour.

For example, a solid gauge representing temperature may go from 0° to 100°. We could say that any temperature up to 40° is fine so ColorBand1 is green, and Color1EndPercent is 40.



(Figure 17)

Temperatures between 40° to 80° are warmer than desired, so this band is yellow. Anything over 80° is getting dangerous, so we transition from yellow towards red during this band.



(Figure 18)

7.2.2. Max & Min

The maximum and minimum values the chart will display. In the graphic above (Figure 18) max is set to 100 and min is 0.

7.2.3. Correctly setting limits

It is possible to set values on all of these properties which make no sense, such as putting the max at 100 and Color2EndPercent at 150. If your chart is not displaying correctly check these values.

If the point value goes past the limit, the gauge will remain full at max value. The chart cannot display negative values lower than min.

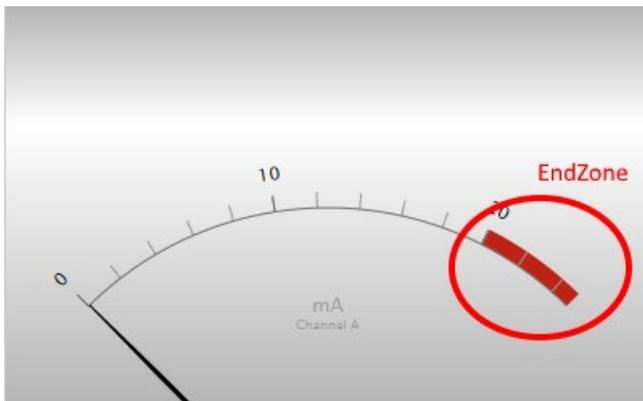
7.3. Point Meter

7.3.1. BackgroundColor

Sets the background colour of the meter widget.

7.3.2. endZoneColor & EndZoneStart

The EndZone is the block of colour at the right of the scale. You can choose where this should start, and what colour it should be.



(Figure 19)

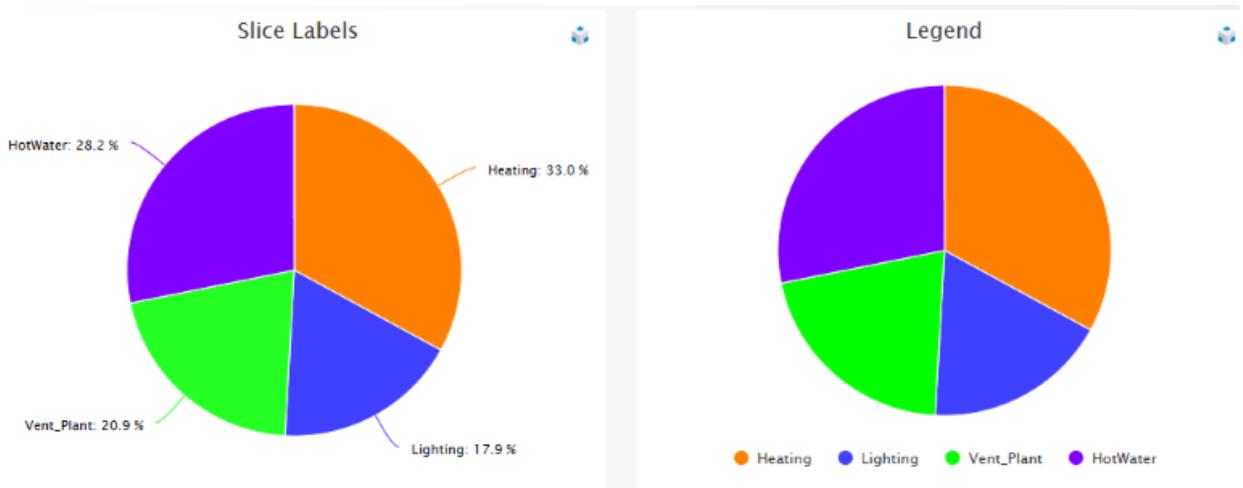
7.3.3. subTitle

Set the text for the label that appears under the units. In the image above (Figure 19) the subtitle is 'Channel A'

7.4. Pie Chart

7.4.1. labelSlices

This property selects between labelling the slices of the pie, or using a legend. If you choose to label the slices the pie chart will change size to accommodate the labels as the values change. If you find this size change undesirable switching to the legend instead will mean the pie remains a constant size.



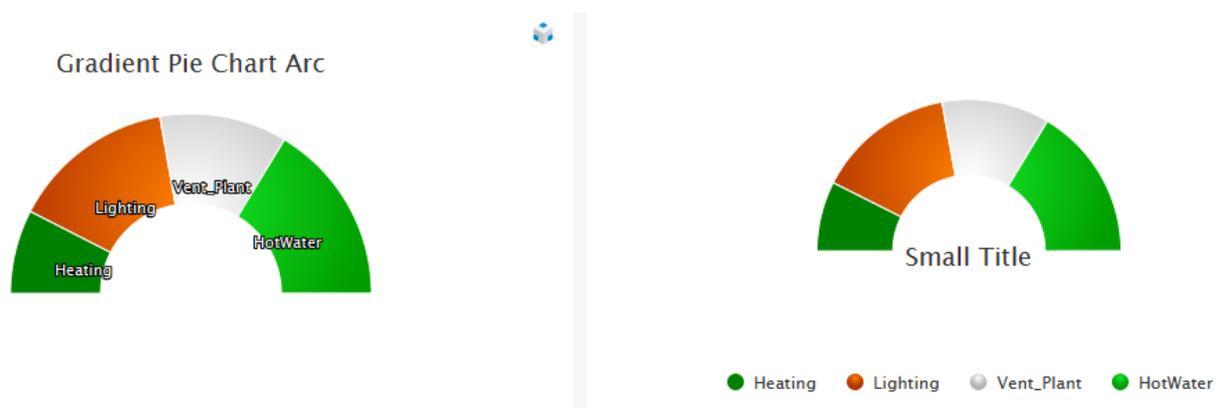
(Figure 20)

In the image above the pie chart on the right has a legend, the chart on the left has the slices labelled.

7.5. Pie Chart Arc

7.5.1. LabelSlices

Similarly to the pie chart you can choose to have the sections of the arc labelled with dynamically placed labels, or a legend at the bottom. In the image below (Figure 21) the chart on the left has the labelSlices Property set to true, the arc on the right is set to false and is using a legend instead as a result.



(Figure 21)

7.5.2. TitleUnderArc

With the arc chart there is the option to put the title under the arc (see the right hand chart in Figure 21 above). Only fairly short titles can fit here, so for longer titles you can select to display them at the top (left side arc).