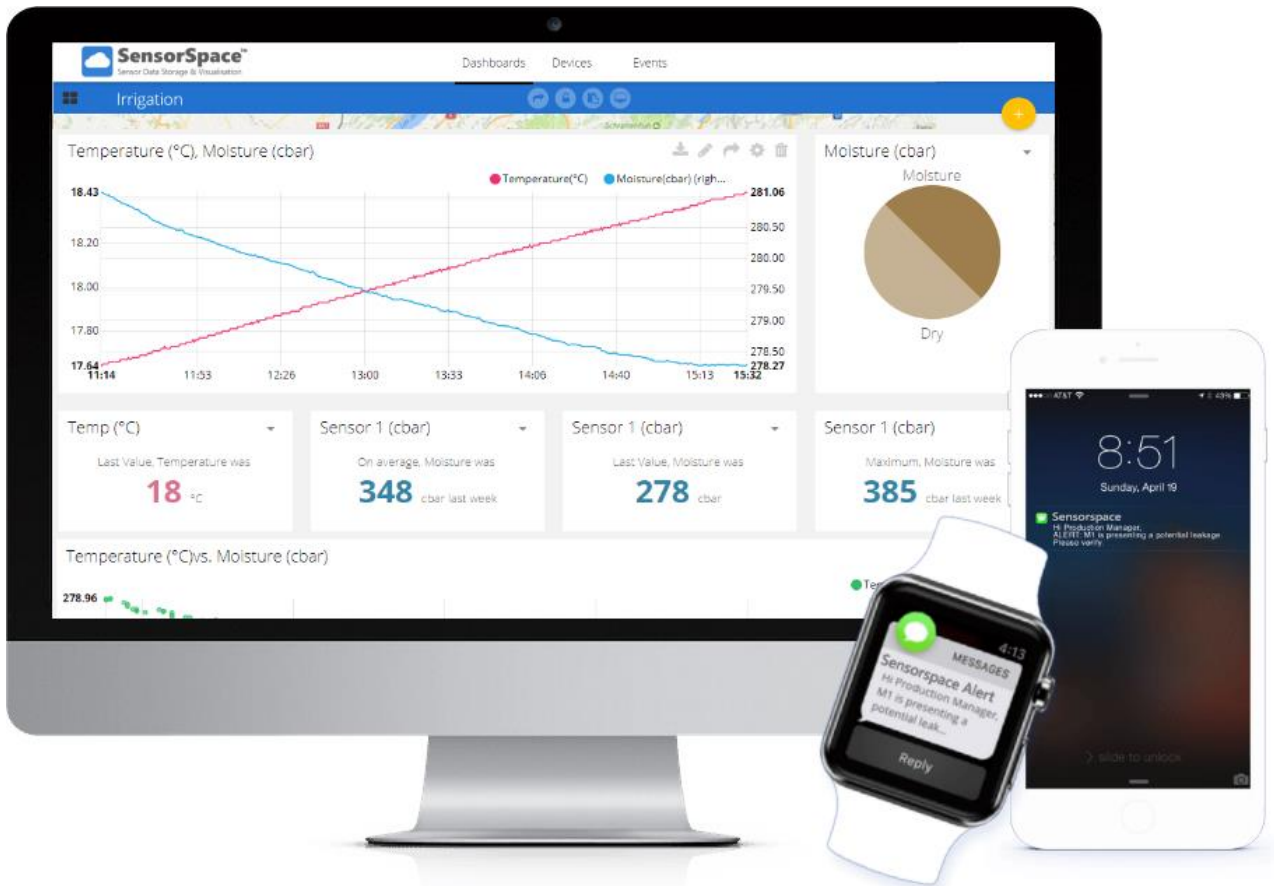


SensorSpace® Cloud Platform User Manual

mantracourt.com



SensorSpace
Cloud Storage & Analytics Platform

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Introduction / Overview

The SensorSpace® cloud platform offers long term storage of time series data combined with the ability to review and export this data via security protected back-end access or to present the data using real-time user defined dashboards accessible to most modern browsers.

Users can augment the delivered data by defining additional synthetic data consisting of rolling window data (minimum, maximum and average over variable time spans) and derived variables which can apply mathematical algorithms to multiple real variables thus creating new data variables.

Access is available through the generic SensorSpace portal or through custom branded organisation portals.

A powerful event engine can generate SMS messages, emails and Telegrams based on simple, stacked *If x then* conditions.

Dedicated hardware and software 'Devices' deliver data to the SensorSpace platform where an Ethernet, Wi-Fi or cellular internet connection can be obtained.

With suitable security tokens the platform will even accept data from your own custom devices

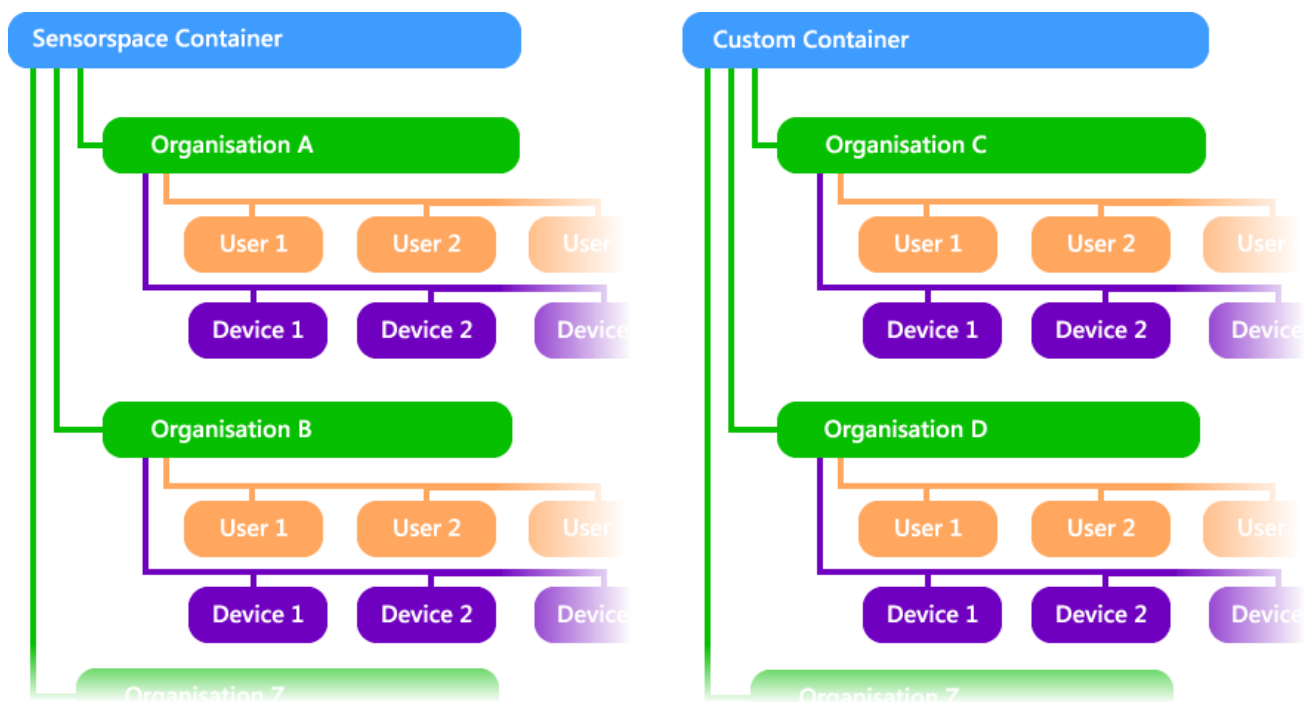
SensorSpace Basics: Container, Organisations, and Users Explained

Containers

A Container is a branded portal which can be customised to your company colours and domain. You may, however, choose to use the generic SensorSpace branded Container to reduce monthly costs.

The Containers contains the following components and features

- **Organisations:** Contain the Users, Devices, Dashboards and Events
- **Users:** Each user has a certain set of allowed actions.
- **Devices:** Physical or Software devices that deliver data (Variables) to the platform. SensorSpace lets you export your data to CSV files.
- **Dashboards:** Display sensor data in in widgets for visualization and computation. SensorSpace let you share via embedding URLs into a websites HTML. Alternatively the public URLS for dashboards may be distributed.
- **Events (alerts):** Actions triggered when data readings fulfil or exceed a design rule. Alerts include SMS, Telegram, Slack, WebHook or setting the value of a variable. (e.g. send an alert when a device stops sending data).



Containers are the parent structure that houses the Organisations and the Devices, Data and Users within the organisations. Different Containers allow for specific branding to be applied across multiple businesses. Choose from English, Spanish, French or Portuguese language support.

Each custom Container incurs additional monthly cost.

What is the difference between a Container and an Organisation?

A Container is a branded user access portal that can be accessed by any user within an organisation. On the other hand, an organisation is a group of users that only have access to those devices provisioned by the Administrator of the SensorSpace platform along with dashboards and events created by users within the Organisation.

Organisations

In SensorSpace, an organisation is any entity that manages users, devices, dashboards and events.

An Organisation refers to an entity, e.g., company or a specific department that manage users and devices. Each organisation can have its own specific users, devices, dashboards and events. Users of SensorSpace can choose to use organisations based on their own criteria and project requirements.

One might think that an organisation must refer to a company, but in SensorSpace an organisation is created with the purpose of managing and compartmentalising users, devices, and dashboards, so the organisations can represent various entities. Each organisation comes with three user logins. One is a manager; one is an explorer and the third being able to access all the organisation's dashboards in read-only mode.

Here are some different ways an organisation can exist:

1 Company Using a Single Organisation

ABC Company wants to install machine monitoring hardware within its own factory and is happy to use the generic SensorSpace branded Container.

ABC Company has a single account with a single Organisation and installs all of its Devices to deliver data to this Organisation. Multiple Dashboards are designed so users can login can see all of the available data. ABC Company can also give read-only access to dashboards by distributing their URLs.

2 Company Managed Organisation with Distributed Dashboards

ABC Company installs monitoring devices onto their customer's machines. Their customers only need to see a single Dashboard each and ABC Company configures the Devices and Dashboards for each customer. Because the customers only need read-only access to the Dashboards ABC Company only needs to have one account on SensorSpace for a single Organisation. ABC Company has the choice of using the generic SensorSpace branded Container or they can pay for their own branded Container.

ABC Company purchases hardware devices as and when required and has them assigned to their single Organisation account. They create the appropriate Dashboard for their customer then give their customer the public access URL for that dashboard. Their customers can use a browser and their unique URL to view only their own dashboard.

ABC Company would manage Events and Alerts for their customers.

3 Company Using Multiple Organisations for its Own Customers

ABC Company provides tank monitoring devices connected to ICU air tanks to multiple local hospitals and remotely monitors each tank's content and conditions using SensorSpace. ABC Company has a custom Container branded with their company logo and colours which is hooked to their own company domain.

Each hospital uses the same Container, but each hospital is classified as a separate Organisation. Within SensorSpace, ABC Company have one custom Container and accounts for Hospital X, Hospital Y, and Hospital Z as separate Organisations, each being billed according to each hospitals rendered services. Each hospital has multiple Dashboards and devices but each hospital can only see Dashboards, devices and data from their own Organisation.

The SensorSpace Administrator will have assigned an administrator login for ABC Company on each of the Organisations along with an administrator and view only logins for the users in each hospital.

By using separate Organisation accounts there can be an authorised Administrator user at each hospital that can edit existing Dashboards, create new ones or manage the Events and Alerts.

Users

Users are assigned by the SensorSpace Administrator when accounts and organisations are created. For each organisation created (The first being included with each new account) there are three users included. Each user can have an email address associated with it for the delivery of downloaded data if that user has access to it.

Users are the individuals interacting with the organisations elements and services i.e., dashboards, triggers, switches, and alerts and different users have different rights as follows:

Manager

Managers can do everything except create or delete a device.

Explorer

Managers can do everything as above but except delete dashboards, templates or widgets. Nor can they change existing devices and variables.

Dashboards

Dashboards users can only view dashboards but *do* get to see *all* dashboards within the organisation.

Customers can add further users to their account and users can span organisations as long as the organisation is owned by the customer. When these users log in they can see all dashboards, devices and data from their affiliated organisations.

Devices

A device is any asset taking in sensor data and transmitting said data through a connection protocol to the SensorSpace cloud platform.

Devices can be hardware or software based. Each Device is uniquely identified with a device name and a Security Token. On purchase of the device the SensorSpace Administrator will assign the Device to a specific Organisation. When the Device is first configured the Device and Variables will be automatically created on the SensorSpace platform. If the Device or Variables are deleted from the SensorSpace platform they will be recreated when the real-world Device next delivers data (However, old data that was deleted will no longer be available).

Variables

Once a Device is configured and connected to SensorSpace, the data created from your sensors are known as Variables.

A variable is a series of data-points that change over time. In most applications it will represent a physical sensor that measures something from the real world, such as Temperature, Humidity, Pressure, Water Level, Disk Usage... or any time-stamped data!

When Variables are created they will be assigned an identifier called an API Label (This may be the channel number of logging software for example) this should not be changed but you can always change the Name and Description of the variable.

As well as the automatically created Raw Variables, users can also create their own Synthetic Variables which can either be derived from mathematic expressions referring to other variables or can be created from statistical, time based expressions such as the average of a particular variable over the last hour.

[Synthetic Variables](#) will be covered in greater detail later in the manual.

In terms of platform storage every time a device updates a variable, then one **value** data-point is created. The number of **values** that can be delivered per month is stated in the selected account plan.

For example, if you have a weather station with 4 sensor variables being updated every 10 minutes (i.e. temperature, humidity, pressure and rain level), then your device will generate:

4 values x 60/10 updates per hour x 24 hours x 30 days = 17,280 **values** per month.



If you delete a Device then all Variables and their data will be deleted. If you delete a Variable then all of its data will be deleted. Also note that the connection between Variables and Dashboards will be broken if Devices or Variables are deleted and will have to be re-applied even though the Device and Variables will be recreated when the physical device next sends data.



*Each device always creates a special status variable called **status** and this delivers textual information on the state of the device or the multiple devices it represents. See Status Widget for a more detailed description of the status variable.*

Events

A conditional event (or alert) is any action triggered when data fulfils or exceeds a design rule. For example, an email or SMS message can be sent anytime a sensor stops sending data or a temperature exceeds a maximum threshold.

Events are based on simple *If Variable (=, > < etc) Value* rules that can be stacked using AND and OR.

The event can also be limited to operate only on certain days or certain times.

The result can send emails, SMS messages, Telegram messages, Slack messages, set the value of another Variable or perform a WebHook to send data to another web service.

A more advanced version of an event can be created called a Scheduled Event where the event happens regardless of any particular input but based on times set by the user.

Events will be covered in greater detail later in the manual.

Dashboards

Dashboards are user designed panels of widgets that display data from delivered variables and user generated synthetic variables formatted in various ways.

Dashboards can provide a read-only view into the data held on the Sensorspace platform. The data can be included from any device that has been assigned to the parent organization.

All users are able to view dashboards but the user level will determine how the user may interact or change the dashboard.

Two types of dashboard can be created:

Static Dashboard

Static Dashboards are used to visualize data from predetermined devices and variables. Static dashboards display the same device and variable data at all times.

Dynamic Dashboard

Dynamic Dashboards utilize a primary and replica (master/slave) technology to visualize data from different devices and variables, using a dropdown menu in the settings bar. By selecting different devices from the settings bar, a dynamic dashboard will refresh with the underlying device and variables populating each widget's visualization according to the device selected.

This is achieved because **dynamic dashboard widgets** are not associated with predetermined specific variables; instead, they are associated with variable labels (**i.e. label=temperature**).

This is a very useful feature as it removes the need to create additional dashboard per device. Imagine you have a fleet of 1,000 trucks; with **static dashboards** you'd have to create 1,000 dashboards. With **dynamic dashboards**, you only have to create one dashboard, and then have the user select the device for which they want to see the data.

Dashboard URLs can also be shared publicly to give anyone the ability to view (read-only) a single dashboard without being required to log in.

Both types of dashboard allow you to change the timespan, over which some widgets display data, using the dashboard settings bar.

Widgets

Widgets are panels of information that can be added to dashboards. The widgets can be resized and relocated on screen and each widget type has multiple settings to define how they look and act and to select which data they display.

Widgets can show numeric values, line charts, bar charts, pie charts, maps, indicators, gauges and tables.

Widgets can also be dynamic or static.

SensorSpace allows you to combine static and dynamic widgets at will. Using our Truck Application example (above), imagine you have a variable with the aggregated fuel consumption across all thousand trucks. You want this variable to be displayed in every truck's dynamic dashboard, regardless of the selected truck. In this case you would create a static widget pointing to a preset variable.

To better understand the difference between static and dynamic, here's a table explaining how a widget behaves when created within a static or dynamic dashboard:

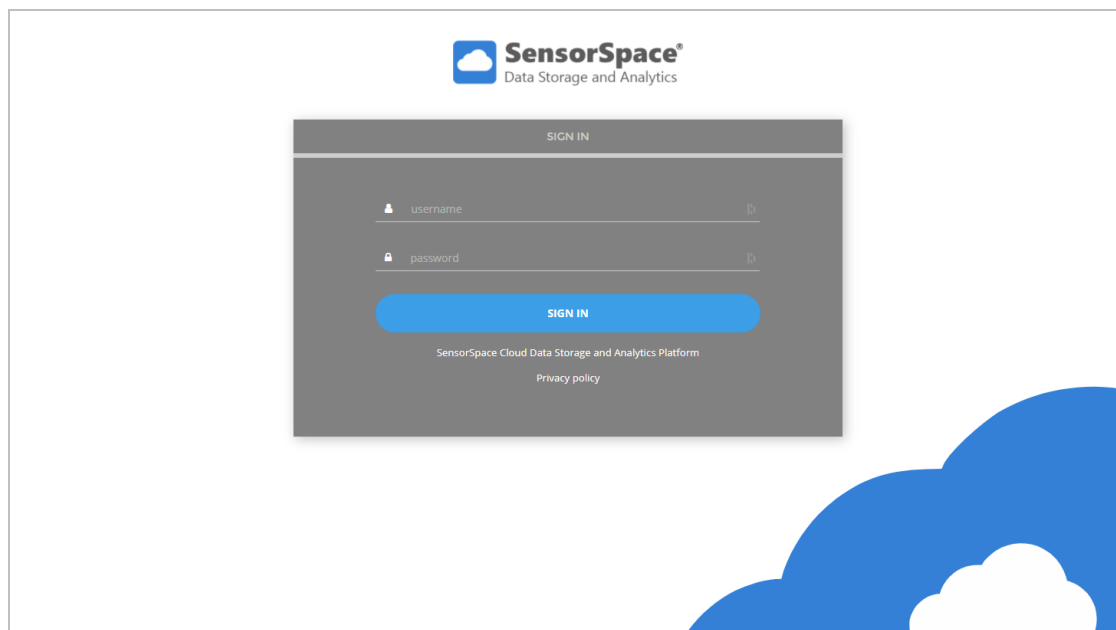
	Static Dashboard	Dynamic Dashboard
Static Widget	<ul style="list-style-type: none">Widget has predetermined variablesThere is no option to select a device in the dashboard's settings bar	<ul style="list-style-type: none">Widget has predetermined variablesWidget will not change when changes are made to the selected device in the dashboard's settings bar
Dynamic Widget	<ul style="list-style-type: none">Not possible! Dynamic widgets cannot exist in a static dashboard	<ul style="list-style-type: none">Widget has predetermined variable labelsWidget will change when changes are made to the selected device in the dashboard's settings bar

Platform

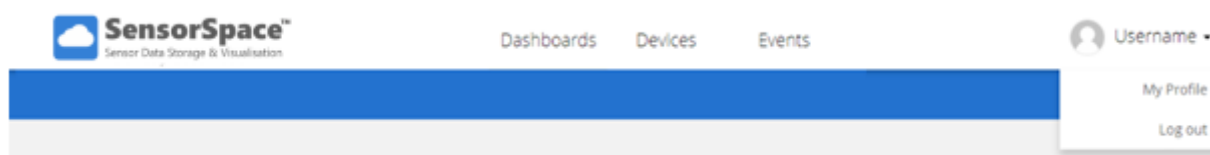
Logging In

To access the SensorSpace Cloud use an Internet Browser to navigate to **sensorspace.com** (You may have a custom container portal in which case use the URL that you have been assigned).

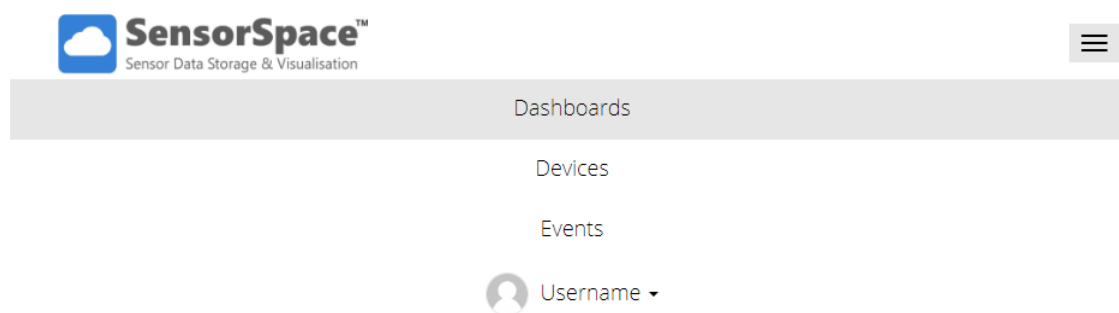
Compatible browsers include Chrome, Safari, Opera, Firefox and Edge. SensorSpace does not like Microsoft Internet Explorer!



Once logged in the interface at the top of the page will look similar to the following.



The three main views of **Dashboards**, **Devices** and **Events** are available from the centre menu and will be described in later sections. Some accounts may not have access to Devices or Events. It should be noted that if the page is too narrow to display these then a ☰ menu will appear on the right hand side and clicking it will display the menu item options as shown below:



On the right of the page (or at the bottom of the menu list on a narrow screen) you will see your login username. In this example it is '**Username**'. Clicking this will drop down a menu listing two options.

My Profile and **Log out**. Logout simply logs you out of the platform so you will need to log in again to use it.

My Profile

This where you can configure your particular log in profile.

SensorSpace™
Sensor Data Storage & Visualisation

Dashboards Devices Events Username ▾

Account Information

My account

Profile Avatar

First name *Empty*

Last name *Empty*

Website *Empty*

Time zone *Europe/London*

Language *English*

Decimal places *2*

Default Dashboard *No default dashboard*

Email *matt@mantracourt.co.uk*

Change Password

New Password

Confirm Password

Change password

Profile Avatar

Clicking on the image to the right offers a choice of loading your own image or deleting the current image. The selected image is shown on all pages at the top right next to your username. This is optional.

First name and **Last name** Enter your name.

Website Optionally enter a web site. This may be used for future features.

Time zone Select a time zone to enable time conversions to work.

Language Select the language for the textual content of the platform. This will include menus and messages. Choose from English, Spanish, Portuguese and French.

Decimal places Select the number of decimal places to display in tables for data values.

Default Dashboard Choose a default dashboard to display when you first log in.

Email This email address is assigned on creation of your account and will be used when downloading exported data. Currently you cannot change this as it is assigned during account creation.

Change Password Enter your new password with confirmation and click the **Change Password** button.

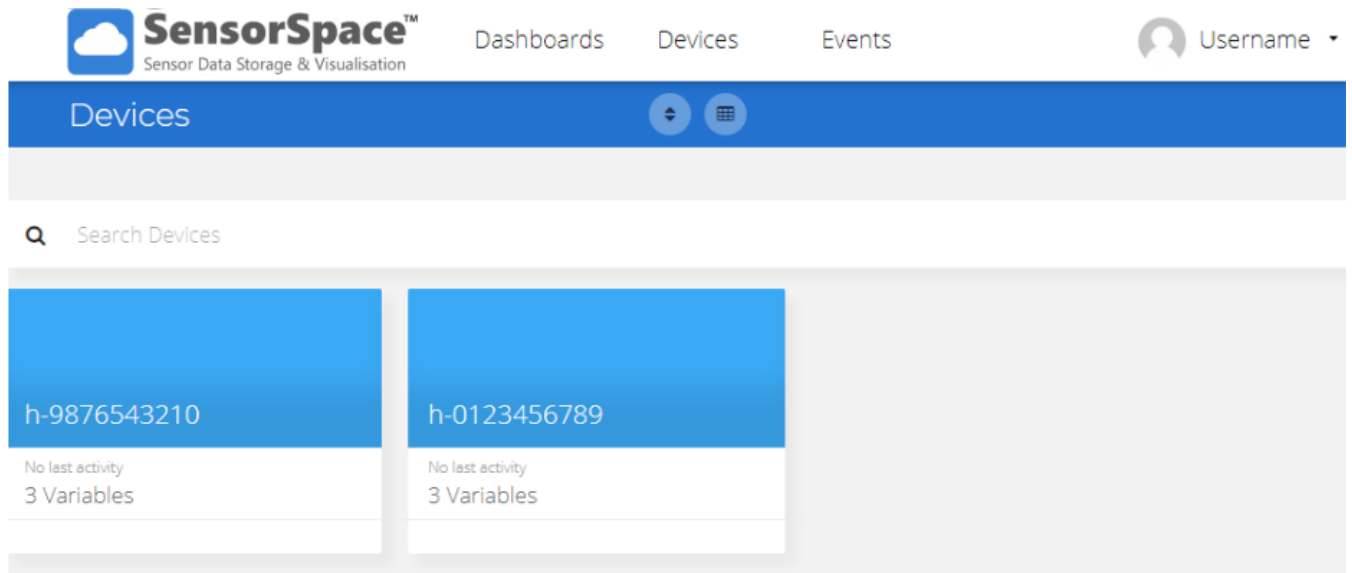
Apart from Change Password, all changes are applied as you make them.

Devices

You arrive at this page by clicking **Devices** on the main menu bar at the top of the browser page. You cannot manually add devices to SensorSpace. They will appear in this section automatically when hardware or software devices make their initial connection with the platform.

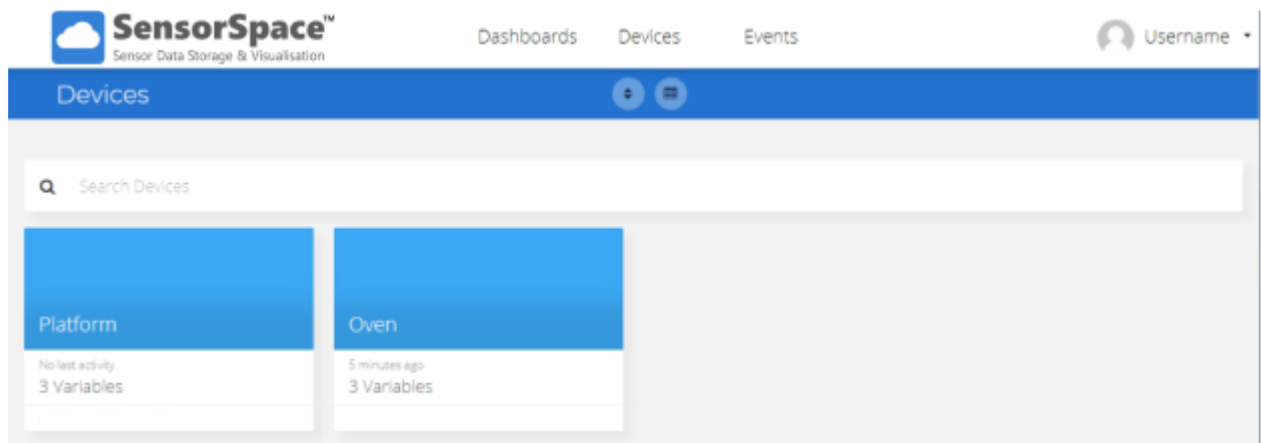
Devices Tile View

This is tile view which displays your devices with minimal information.



The devices will be shown on this screen. In the above example there are two devices. Type partial or full device name in the Search Devices text area to limit the view to matching devices.

You can double-click the device name to change it. Press the Return/Enter key when finished. Once a device is renamed you will see your new name instead of the originally assigned identifier.



Click to sort the devices. This offers a pop-up menu to select Alphabetical, Last Updated or Last Created order.

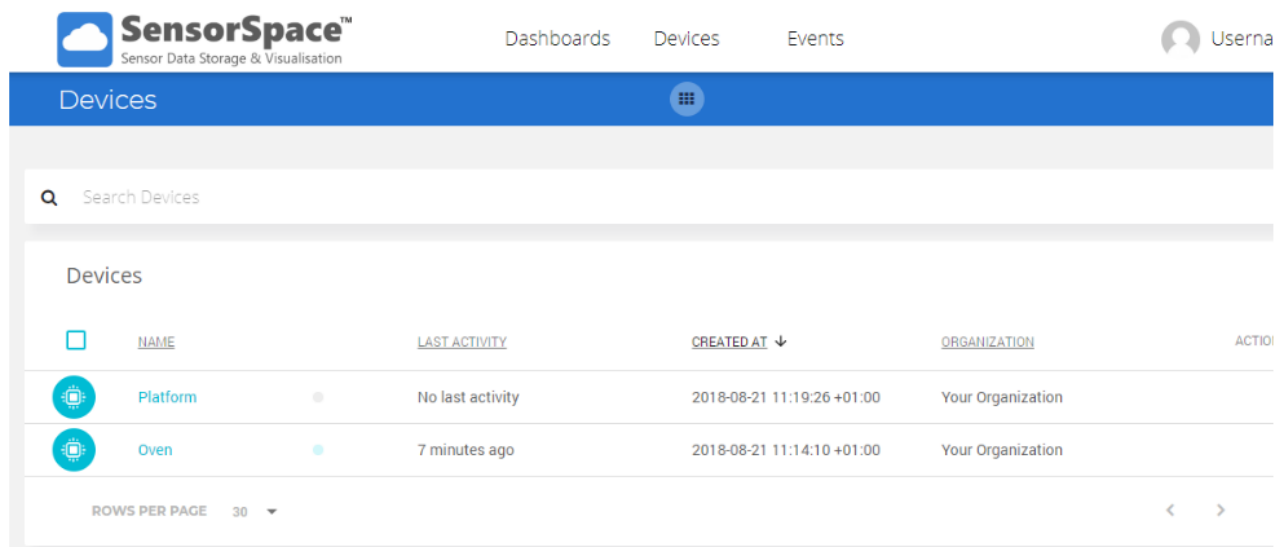


You can switch to [List View](#) by clicking this button. This displays the devices in a more detailed view.





Single-click the device name to view the variables in that device. This opens a new page listing the device details and variable list. See [Variable Detail page](#).

Devices List View

List view gives an easier to read list of devices and is a much better view choice when there are many devices.



The screenshot shows the SensorSpace web interface. At the top, there's a navigation bar with the SensorSpace logo (Sensor Data Storage & Visualisation), and links for Dashboards, Devices, and Events. A user profile icon labeled 'Userna' is on the right. Below the navigation bar is a blue header with the word 'Devices' and a grid icon. A search bar labeled 'Search Devices' is below the header. The main content area is titled 'Devices' and contains a table. The table has columns: NAME, LAST ACTIVITY, CREATED AT, ORGANIZATION, and ACTION. There are two rows of device data. The first row is for a device named 'Platform' with a pulsing dot, indicating it is online. The second row is for a device named 'Oven' with a solid dot, indicating it is offline. At the bottom of the table, there is a 'ROWS PER PAGE' dropdown set to 30 and navigation arrows.

	NAME		LAST ACTIVITY	CREATED AT ↓	ORGANIZATION	ACTION
	Platform		No last activity	2018-08-21 11:19:26 +01:00	Your Organization	
	Oven		7 minutes ago	2018-08-21 11:14:10 +01:00	Your Organization	

Some users may be allowed to view the devices from multiple organisations so the addition of the Organisation column may be beneficial in some cases.

A pulsing dot to the right of the name indicates those devices that have delivered data within the last few hours (i.e. Online)

Click the device name to view the variables in that device. This opens a new page listing the device details and variable list. See [Variable Detail page](#).

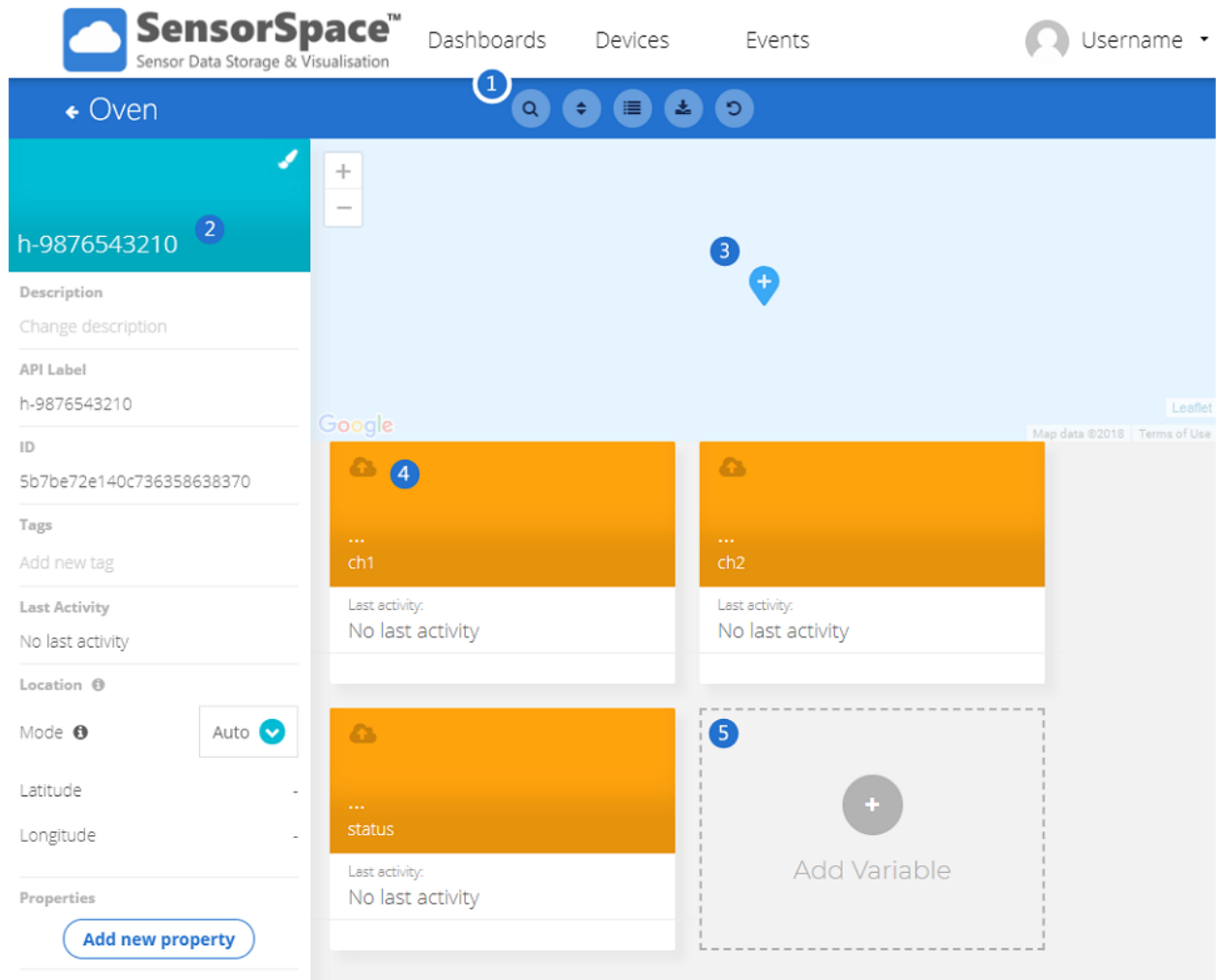
Device Groups

If you support multiple devices within an organisation it is possible to group any combination of devices into a Device Group. You can then create a global event that is based on the variables in all the devices in the group. For example, you could group together ten devices that each delivered a variable Temperature, then create a single event that looked at the temperature variable from that group so if ANY device's temperature variable exceeded a set limit you could trigger an action. This can save creating an event for each and every device.

To group together devices contact SensorSpace support.

Variables Tile View

This shows detailed device information and a list of variable contained in the device.



Icon Buttons

1



Search Variable – Click to enter the partial or full name of the variables to search for. Only those variables whose names contain the search term will be shown. Click the 'X' to show all variables again.



Sort variables – Click to select either Alphabetical, Last Updated or Last Created order to list the variables.



Toggle View – Click to toggle the view between tile view and list view. See [List View](#) later.



Export Device Data – Click this to enter a range of dates and provide a list of email addresses. The device data for all variables between these dates will be sent to the email addresses as a CSV file attachment.



Reset Device Data – This allows to to reset (DELETE) all the data held by the device. Be very careful with this function. To continue you must type in the name of the device to confirm deletion.

2



Click the paintbrush icon to select a colour for this device. This colour will be used in the list and table views and also by the [Map Widget](#) where the location indicators can optionally be shown in this device colour.

Device Name (Not Titled)

Click to edit the device name. Click elsewhere or press Return/Enter key to finish.

Description

You can add or edit the device description by clicking here.

API Label

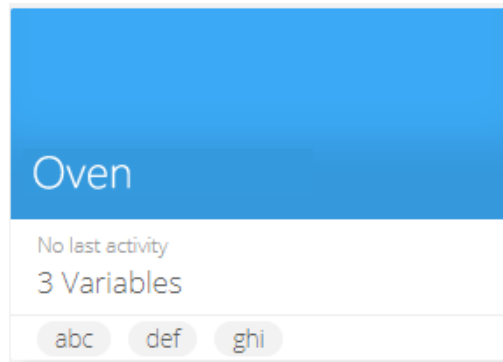
This is used by the actual hardware and software devices to identify this device. DO NOT CHANGE!

ID

This is used by the underlying structures to associate and identify devices. DO NOT CHANGE!

Tags

You can enter multiple tags by clicking here, typing your tag and pressing Return/Enter. Multiple tags can be assigned to a device. These tags help you identify devices and they are shown on the device tile in tile view.



Last Activity

Shows the last time a variable was delivered to this device.

Location

The device's location, used to update the map in the device view, as well as dashboard widgets. Some devices may deliver GPS location data in one of their variables.

Mode

The variable used to determine your device's location.

If "Auto" is selected, then location data will be automatically searched for in any variable called 'gps', 'location' or 'position'.

If necessary you can select one of the other variables from the drop-down list.

Or you can select Manual to manually select a position from the map at the top of the



page. Click the symbol and drag it to the desired location on the map.

Latitude

When the location is manual, this will be updated from your selection from the map or the value can be directly edited.

Longitude

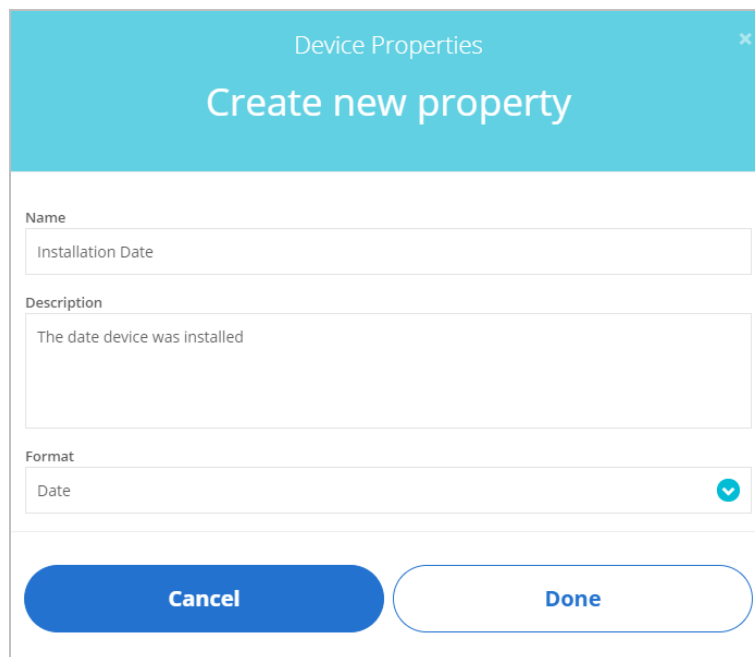
When the location is manual, this will be updated from your selection from the map or the value can be directly edited.

Properties

Add New Property

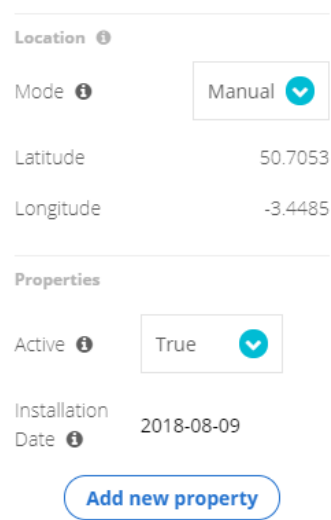
Click to create new properties. Properties are your own custom fields that can be filled in. Enter the property name and a description and select a suitable data type for the

information. These can later be displayed in the [Device Table Widgets](#).



The screenshot shows a modal dialog titled "Device Properties" with a close button (X) in the top right corner. The main heading inside the dialog is "Create new property". Below this, there are three input fields: "Name" with the value "Installation Date", "Description" with the value "The date device was installed", and "Format" with a dropdown menu showing "Date" and a blue checkmark icon. At the bottom of the dialog, there are two buttons: a blue "Cancel" button and a white "Done" button with a blue border.

These new properties then appear at the bottom of the panel and allow the information to be entered by clicking to the right of their names.



The screenshot shows a panel with two sections. The "Location" section has a header with an information icon (i) and contains three rows: "Mode" with a dropdown menu showing "Manual" and a blue checkmark icon, "Latitude" with the value "50.7053", and "Longitude" with the value "-3.4485". The "Properties" section has a header with an information icon (i) and contains two rows: "Active" with a dropdown menu showing "True" and a blue checkmark icon, and "Installation Date" with the value "2018-08-09". At the bottom of the panel, there is a blue button labeled "Add new property".

Location Map

3

Click the blue location icon to set the location manually. Use the + and – buttons to zoom in and out.

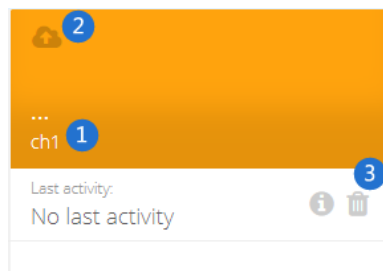


Variable Tiles

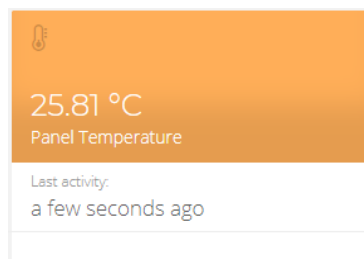
4

On the variable tiles there are also a number of options.

1. You can double-click the name to edit it. Just press the Return/Enter key to finish.
2. Click the icon in the top left corner to change it.
3. When your mouse is hovering over a tile a delete icon will appear. Click this to delete the variable.



If the variables contain data then further information will be displayed on the tile.



Warning

This will also delete all data stored for that variable.

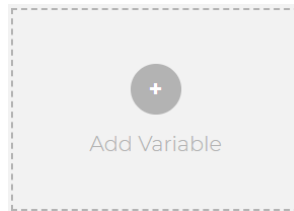
If this is a variable that is delivered by the actual hardware or software device then it will be re-created the next time data is delivered. But not the historical data.

If variables have been referenced by any widgets on a dashboard then deleting the variable may result in the widget requiring editing to re-reference variables before it will work again.

Add New Tile

5

To add a new variable click the Add variable tile.

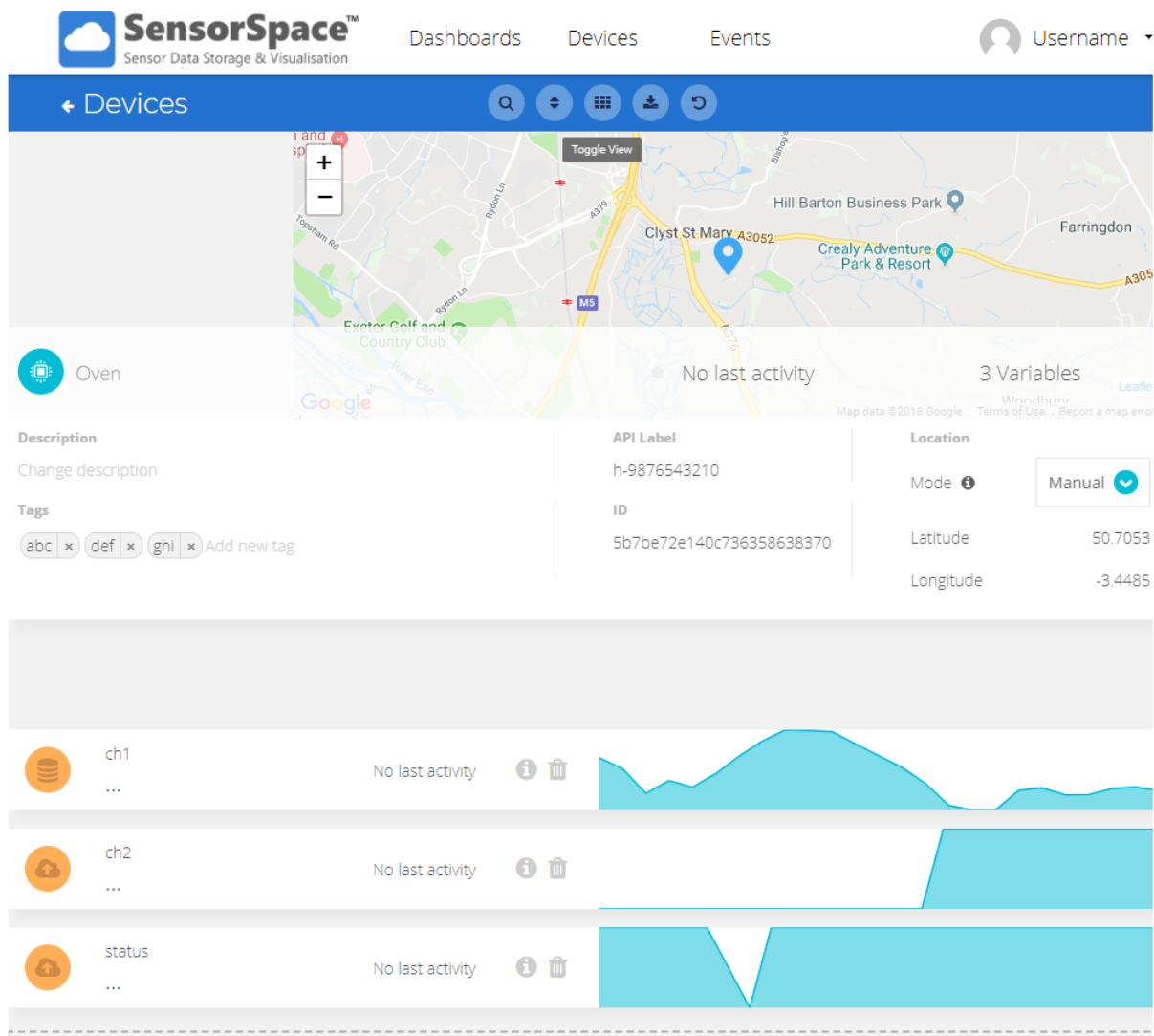


You can then choose whether to add a Raw or [Synthetic variable](#). The newly created variable will then appear in the list. See [Synthetic Variables](#) for more information.

Clicking on a variable tile will open the [Variable Detail Page](#).

Variables List View

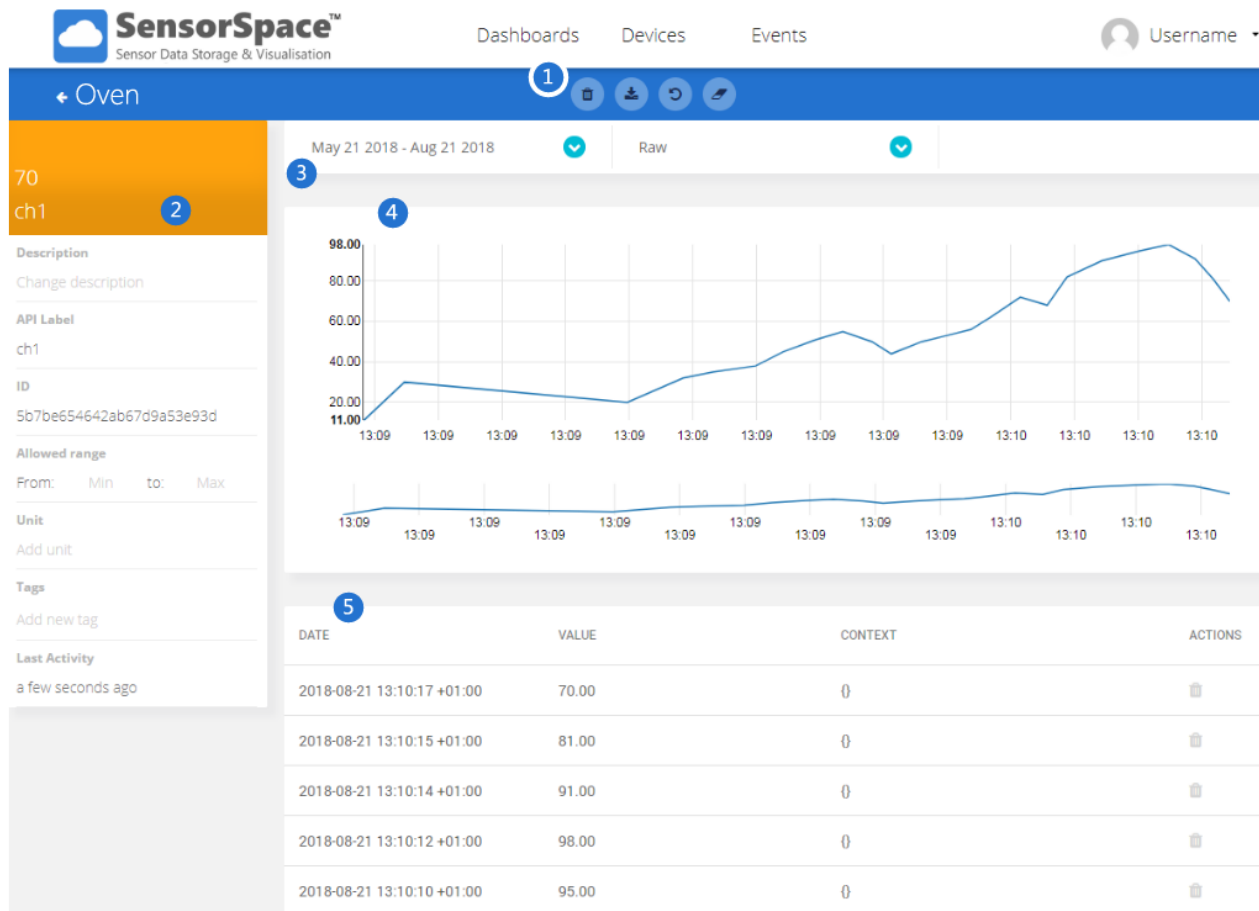
This view contains the same information as [Tile View](#) except that it is repositioned to give a vertical stack of variables.

The screenshot shows the SensorSpace web interface. At the top is a navigation bar with the SensorSpace logo, "Sensor Data Storage & Visualisation", and links for "Dashboards", "Devices", and "Events". A user profile icon and "Username" are on the right. Below the navigation bar is a "Devices" section header with a search icon and several action icons. The main content area features a map of a location with a "Toggle View" button. Below the map, the "Oven" device is selected, showing "No last activity" and "3 Variables". A table lists the variables: "ch1", "ch2", and "status". Each variable has a "No last activity" status, an information icon, a delete icon, and a corresponding data visualization (area chart for ch1 and ch2, and a bar chart for status).

The main difference with this view is that a selection of the historical data is shown next to each variable. Clicking on a variable tile will open the [Variable Detail Page](#).

Variable Detail Page

Clicking on a variable from either tile view or list view will show the variable information in detail.



Icon Buttons

1



Delete Variable – Click to delete this variable.



Deleted data cannot be retrieved even if this variable is re-created by the next device data delivery.



Export Variable Data – Click this to enter a range of dates and provide a list of email addresses. The variable data between these dates will be sent to the email addresses as a CSV file attachment.



Delete All Values – This allows to delete all the variable data held by the device. Be very careful with this function. To continue you must type in the name of the variable to confirm deletion.



Delete Values In a Range – This allows to delete all the variable data held by the device between two specified dates.

Side Panel

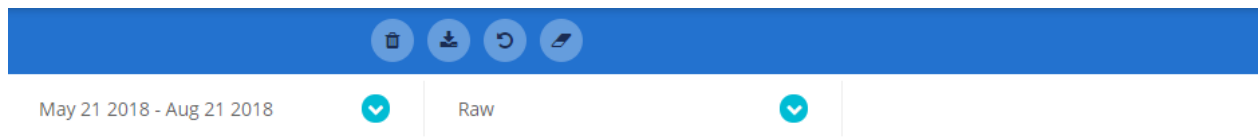
2

Variable Name (Not Titled)	Click to edit the variable name. Click elsewhere or press Return/Enter key to finish.
Description	You can add or edit the variable description by clicking here.
API Label	This is used by the actual hardware and software devices to identify this variable. DO NOT CHANGE!
ID	This is used by the underlying structures to associate and identify variables. DO NOT CHANGE!
Tags	You can enter multiple tags by clicking here, typing your tag and pressing Return/Enter. Multiple tags can be assigned to a variable. These tags help you identify variables and they are shown on the device in tile view.
Last Activity	Shows the last time a variable was delivered to this device.

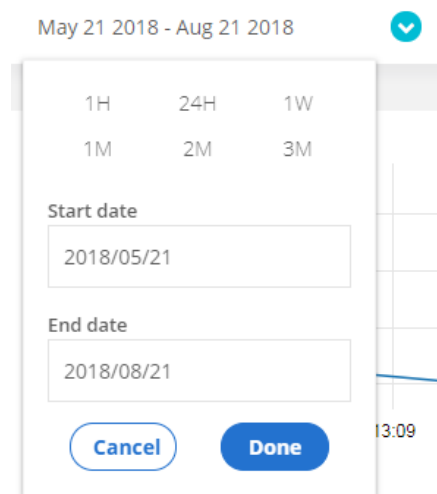
Data Selection

3

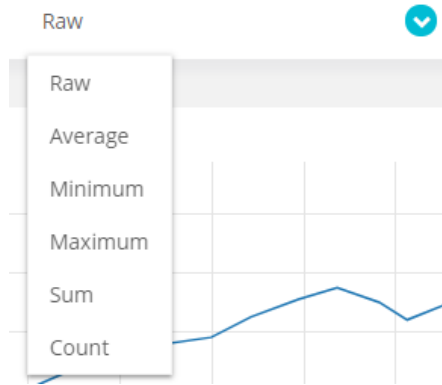
The data selection controls appear beneath the button icons.



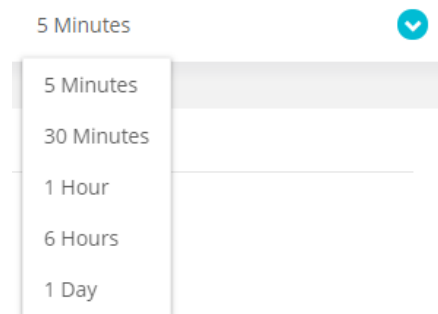
Click the date on the left to pop-up a date range selection box where you can define the date span or select the preset time spans from the top.



You can select whether to view the raw data or to aggregate it in various ways. Click to where it shows 'Raw' to display a list of ways to view the variables data. Select from



Selecting anything other than Raw will display a second drop down list to the right from which a time period can be selected for the type selected.



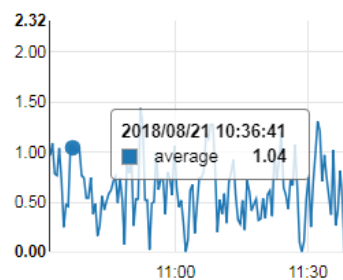
For example, select to show the Average every 30 minutes:



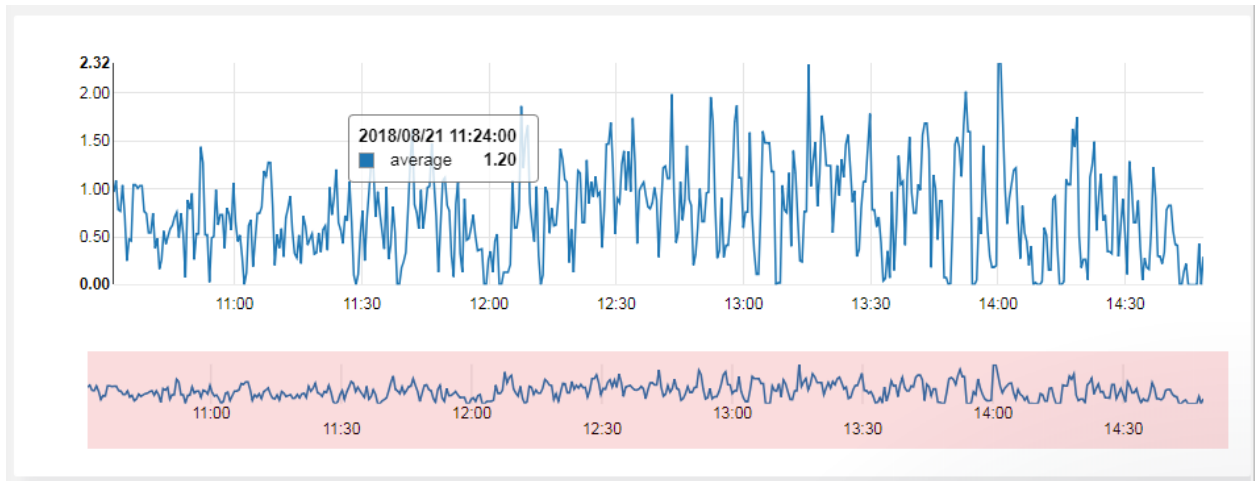
Chart

4

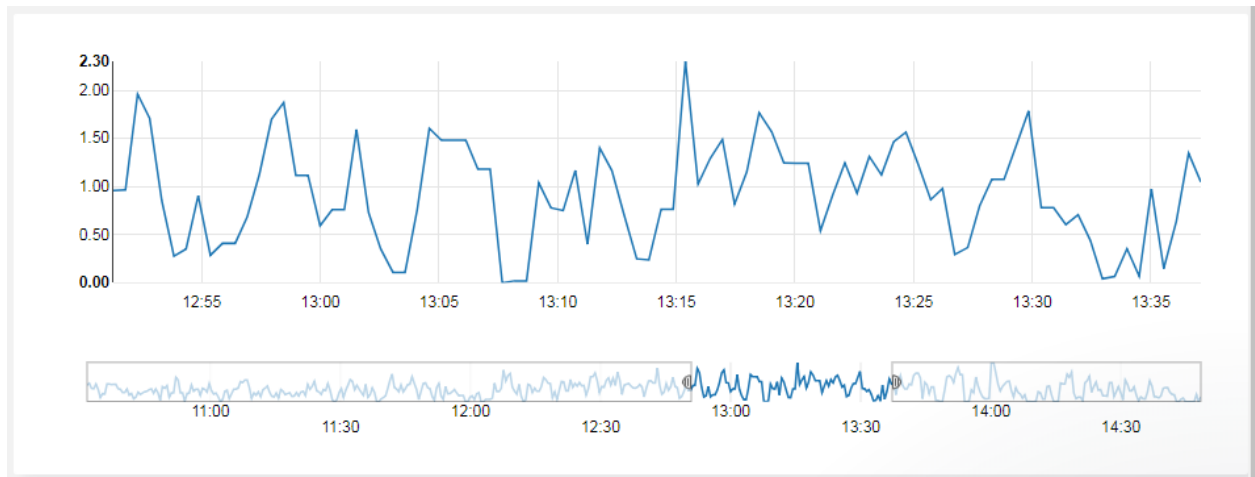
The chart shows the data from the selected data range described above. You can run the mouse over the data to be shown time and date information.



You can zoom and pan through the chart data by clicking and dragging horizontally in the navigation section of the chart shown below in red:



This will then display the selected area in the navigation area as shown below.



The selected area handles can be dragged to make the selected area wider or narrower.



Or click and drag in the middle of the selection to pan around the data.



Data Table

5

This view simply shows the recent data values in a table format. Individual data points may be deleted by clicking the bin icon on the left.

The Context column shows textual data that is present in *some* variables delivered by devices. For example, this would be present in the Status variables and any variables containing GPS location data.

Synthetic Variables

SensorSpace's Analytics Engine supports a complex mathematical computation tool called **Synthetic Variables**. Simply, a variable is any raw or computed data within a device in SensorSpace. A Synthetic Variable is a variable that results from the computation of other variables within SensorSpace.

SensorSpace stores values that come from your devices as raw variables, and these stored values have corresponding timestamps that organize each value into a time-series list, using the following sequence:

$$values = \{[value_1, timestamp_1], [value_2, timestamp_2], \dots, [value_n, timestamp_n]\}$$

With SensorSpace Analytics Engine, you can apply different operations to the time-series data-set to create an adjacent data-set containing computed variables. These new variables are **Synthetic Variables**.

Synthetic Mathematical Variables

A synthetic mathematical variable consists of a global math operation applied to the whole time-series:

$$Raw\ values = \{[value_1, timestamp_1], [value_2, timestamp_2], \dots, [value_n, timestamp_n]\}$$

$$Square\ root\ values = \{[\sqrt{value_1}, timestamp_1], [\sqrt{value_2}, timestamp_2], \dots, [\sqrt{value_n}, timestamp_n]\}$$

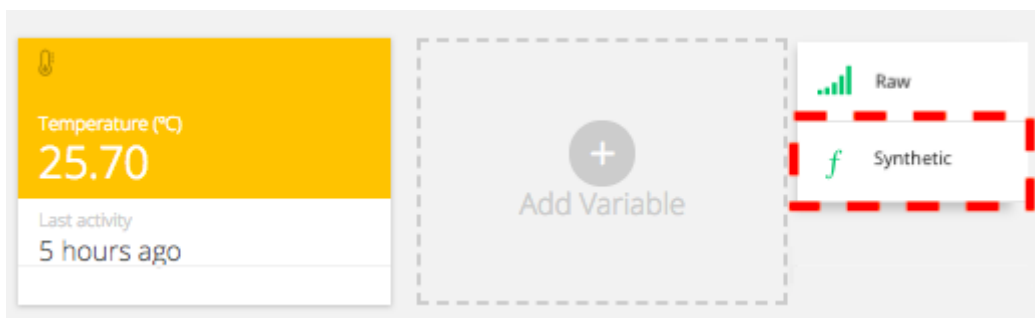
For example, in the figure above, a square root operation is applied to all the time-series.

This tool is very useful to extend your application's functionality, i.e if you have a temperature module that delivers the variable in °C and you wish to show the data in both °C and °F you can use a synthetic variable to perform the required calculations to convert to °F.

$$\overset{\text{Synthetic Variable}}{^{\circ}F} = (9/5 * \overset{\text{Raw Variable}}{^{\circ}C}) + 32$$

Synthetic computation example: From Celsius to Fahrenheit

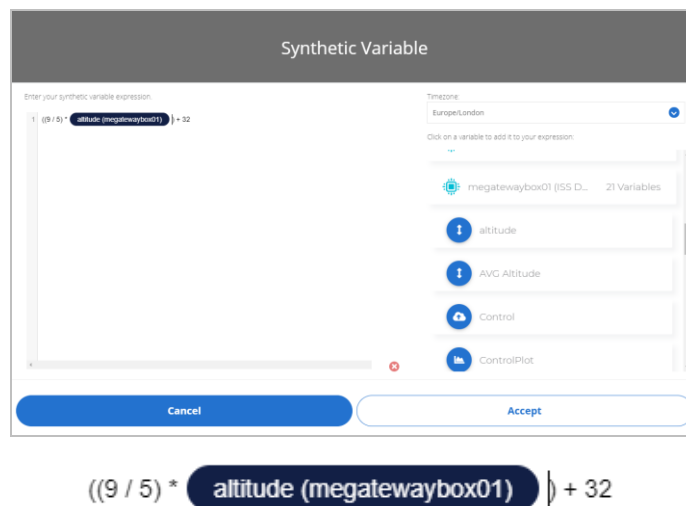
To create a synthetic variable, simply click on the "Add Variable" option within your device, then select "Synthetic".



To implement the temperature function mentioned above we would want to perform the following function

$$F = ((9 / 5) * raw_variable) + 32$$

In your editor it may look like this:



The Timezone setting is useful when using Time Range Functions. See later.

To insert the raw variable just locate the appropriate device in the list on the right of the screen, click it and select the desired variable. The 'token' for that variable will be inserted into the expression at the current cursor location (represented below as `{{var}}`).

There are several available functions to create mathematical synthetic variables; below you can find a list of available functions:

- `ceil(x)` : Returns the ceiling of x as a integer, the smallest integer value greater than or equal to x.
- `floor(x)` : Returns the floor of x as a integer, the largest integer value less than or equal to x.
- `round(x, n digits)` : Returns the floating point value number rounded to "n" digits after the decimal point.
- `tan(x)` : Returns the tangent of x radians.
- `cos(x)` : Returns the cosine of x radians.
- `sin(x)` : Returns the sine of x radians.
- `arctan(x)` : Returns the inverse tangent of x radians.
- `Arctan2(x,y)` : Returns the inverse tangent of x,y as Cartesian coordinates. (x and y must have the same time series)
- `arccos(x)` : Returns the inverse cosine of x radians.
- `arcsin(x)` : Returns the inverse sine of x radians.
- `tanh(x)` : Returns the hyperbolic tangent of x radians.
- `cosh(x)` : Returns the hyperbolic cosine of x radians.
- `sinh(x)` : Returns the hyperbolic sine of x radians.
- `log(x, base)` : Returns the logarithm of x in the specified base (by default base = Euler number).
- `sqrt(x)` : Returns the square root of x.
- `abs(x)` : Returns the absolute value of x.
- `exp(x)` : Returns the exponential value of x.

In the above list **x** can be just a variable `{{var}}` or an expression such as `{{var}} * 2`.

Standard arithmetic operations work just fine too:

- | | |
|---------------------|----------------------------|
| • Addition: + | • Exponentiation: ** |
| • Subtraction: - | • Modulo: % |
| • Division: / | • π : pi |
| • Multiplication: * | • Euler's number: e |

Synthetic Data Range Variable

SensorSpace also lets you create new variables from your time-series based on date range data, i.e calculate average temperature per hour or per day based on your sensor's readings using a synthetic variable. Below you can find the commonly used data range functions and formula structure:

- `max({{var}}, {{data_range}})` : Calculates the maximum value of the variable `{{var}}` in the specified `{{data_range}}`.
- `Min({{var}}, {{data_range}})` : Calculates the minimum value of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `Std({{var}}, {{data_range}})` : Calculates the standard deviation of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `mean({{var}}, {{data_range}})` : Calculates the mean value of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `median({{var}}, {{data_range}})` : Calculates the median value of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `variance({{var}}, {{data_range}})` : Calculates the variance value of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `count({{var}}, {{data_range}})` : Calculates the number of values received stored in the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `last({{var}}, {{data_range}})` : Returns the last value of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `sum({{var}}, {{data_range}})` : Returns the summation of the variable `{{var}}` time-series in the specified `{{data_range}}`.
- `cumsum({{var}})` : Returns the cumulative sum of the variable `{{var}}`.

Available `{{data_ranges}}`:

- "nT" : Every n minutes
- "nH" : Every n hours
- "nD" : Every n days
- "nW" : Every n weeks
- "nM" : Every n months
- "W" : Every end of week
- "M" : Every end of month



The selected range should be set in a way that evenly divides the next range up. For example, if using minutes ("T"), whatever the number is, it has to evenly divide an hour ("H"). Under such example, the available values for minutes are: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30. Other values may render unexpected results. Same applies to other ranges.

The synthetic variables editor allows you to select the timezone to reference the exact variable's timestamps based on a particular timezone. This come in handy when, for example, working with **Data Range Functions** to calculate a min or max in a day. If your clients are in California but you're assembling the App in Georgia, this timezone in the Synthetic Variable will utilize the correct data based on the timezone selected.

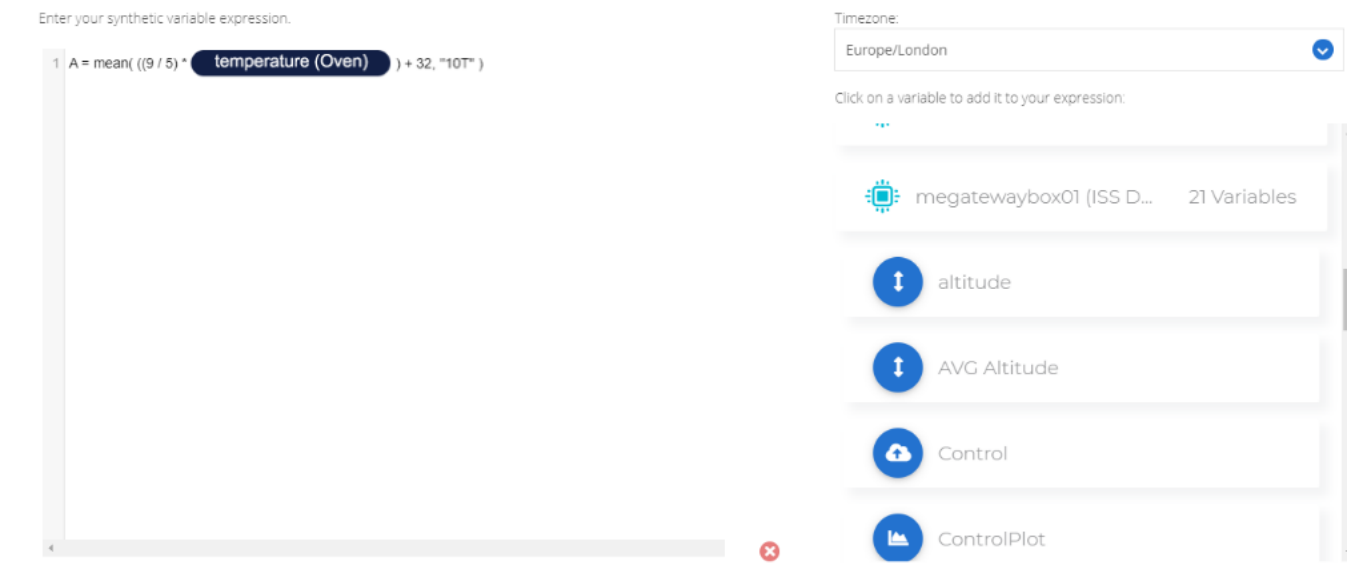
After clicking the "Accept" button, the Synthetic Variable will calculate data as if from the timezone selected and the expression and results will be automatically saved in the history trails of the variable.

Simple Example:

If you wish to know the average °F of your variable every 10 minutes, you would implement the function structure below

```
A = mean( ((9 / 5) * {{var}}) + 32, "10T" )
```

The expression editor may look as follows:



By default, every n data range starts its period at 00:00:00, however, there are particular applications where the desired starting point is not 00:00:00 but rather 02:00:00 or 00:40:00, depending on the input data range. To apply an offset, the above functions can receive a third parameter called offset, as follows:

```
A = sum( {{var}}, "8H", offset=6)
```

The above example corresponds to the sum of variable `{{var}}` computed every 8 hours, offset by 6 hours (beyond 00:00:00), that is, 06:00:00. Accordingly, your synthetic variable will be run at 06:00, 14:00, and 22:00 daily.



The difference between the Data Range functions and the Mathematical functions is that Mathematical Functions generate a synthetic variable value for each corresponding raw variable value whereas the Data Range functions generate a new synthetic variable value only at each Date Range interval.

Special Synthetic Functions

There are also some special functions that are suitable to create more complex analytics:

`where(condition, operation if true, operation if false)` : Performs the operations depending on whether the condition is True or False. The False section is optional but if omitted and the condition is false then no value will be assigned.

`fill_missing(x)` : Will enter the last value of a variable when function expression **x** requires data from a timestamp that does not match the other timestamps within the expression.

`shift(x,n)` : Will return the value of the variable offset by the number of steps specified by **n** in the time series. (**n** must be integer)

`cumsum(x)` : Calculates the cumulative sum of the time series.



Note: The above functions do not get calculated in real-time. It may take several minutes to process a batch of values using these functions.

Examples

Populates the new synthetic variable with a '1' if the temperature value is greater than 20:

```
where({{var}} > 20, 1)
```

Populates the new synthetic variable with a '1' if the temperature value is greater than 20, but on the contrary, fills with '0' if the value is below 20. (Ideal for automation applications):

```
where({{var}} > 20, 1, 0)
```

Stores the variables' timestamp if it is lower than 10:

```
where({{var}} < 10, {{var}}.timestamp)
```

this dot, '.', operator lets you access and represents the variable's timestamp.

Computes an expression containing multiple variables with different timestamps, filling any non-equal timestamped values with the non-equal variable's *last value*.

```
fill_missing(3 * {{var1}} + {{var2}})
```

This would be useful when combining variables from different devices or when combining a raw variable and a data range synthetic variable.

To store the difference between the current value and the previous value:

```
{{var}} - shift({{var}}, -1)
```

Advanced Examples

In this section, you will learn how to get the most out of the Synthetic Variables Engine using special functions or their combination to render more complex expressions.

Creating a Synthetic Variable using context data

SensorSpace variables can store metadata that isn't necessarily a numerical value. Most common usage of variable context is for the latitude and longitude GPS coordinates. While those values are indeed numerical, it comes quite handy to send them in a single variable instead of 2 separate variables.

Some devices will deliver this type of data and this example shows how you can use it in your synthetic Variable expressions.

Context data can only be used within your synthetic expression if the context is a numerical value. Accessing it from the Synthetic editor is straightforward, you just need to add the dot '.' operator after the variable then another dot followed by the context key identifier:

```
{YOUR_VARIABLE}.context.context-key
```

Note: To find more information about context-key refer to the product manual for the device that is delivering the context data.


Example:

Suppose that you need to use the Haversine formula to calculate the shortest distance between two locations over the earth's surface based on Latitude and Longitude data. This would be as follows:

```
Δlat = lat2 -lat1
Δlng = lng2 -lng1
a = sin2(Δlat/2) + cos lat1 · cos lat2 · sin2(Δlng/2)
c = 2 · arctan2( √a, √(1-a) )
d = R · c
```

where `lat` is **latitude**, `lng` is **longitude** and `R` is earth's radius (mean radius = 6,373km); note that angles need to be in radians in order to pass it to the trigonometric functions.

Keep in mind that **latitude** and **longitude** are numerical data stored inside the context of a variable as shown below:

DATE	VALUE	CONTEXT	ACTIONS
2019-08-02 17:27:28 -05:00	1.000	<code>{"lat":6.236259,"lng":-75.580335}</code>	

The synthetic expression to calculate the distance will look similar to this one in the synthetic variable editor:

```
1 lat1 = position (machine1) .context.lat
2 lng1 = position (machine1) .context.lng
3 lat2 = position (machine2) .context.lat
4 lng2 = position (machine2) .context.lng
5 dlng = lng2 - lng1
6 dlat = lat2 - lat1
7 a = sin(dlat/2*pi/180)**2+ cos(lat1*pi/180) * cos(lat2*pi/180) * sin(dlng/2*pi/180)**2
8 c = 2 * arctan2(sqrt(a), sqrt(1-a))
9 c * 6373
```

where `lat1`, `lat2`, `lng1`, and `lng2` uses the value inside the context to make the proper calculations.



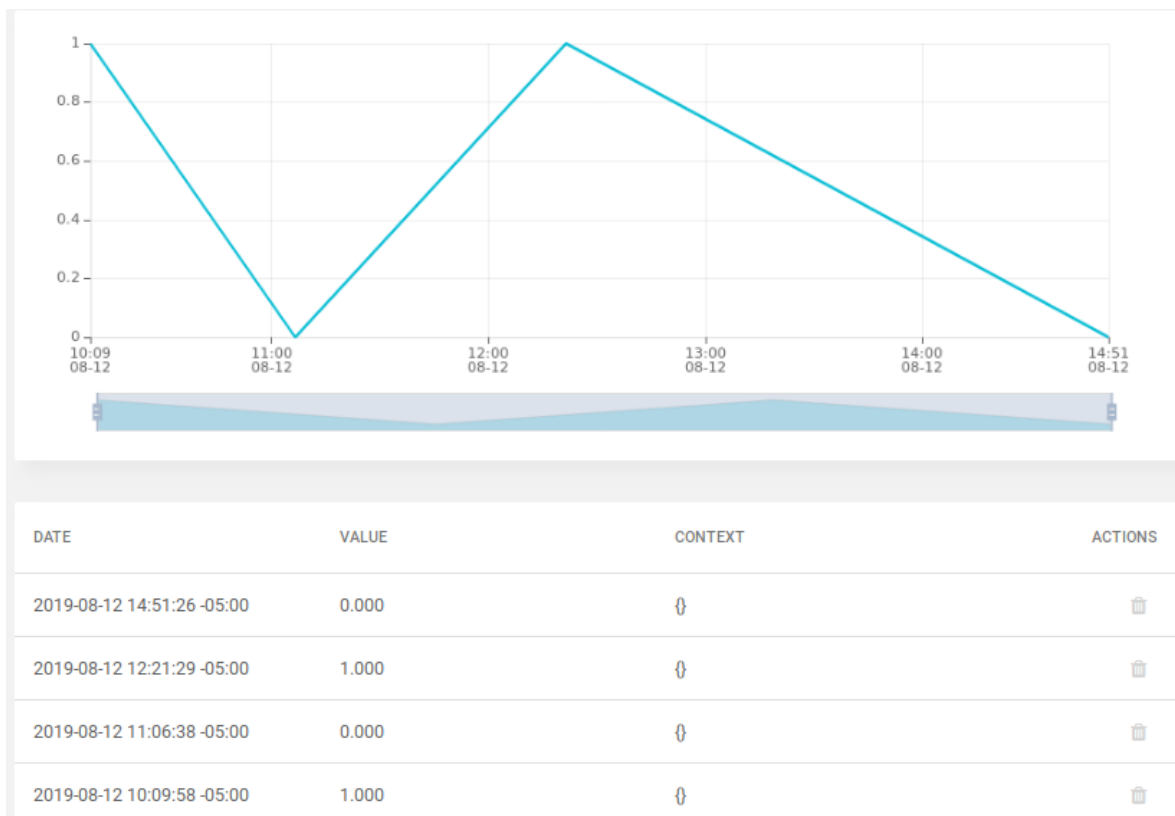
The example above assumes that the variables have the same timestamp. If not, the **fill_missing()** expression needs to be included.

Creating a Synthetic Variable using timestamp

Similarly to accessing context data it happens with the timestamp. It can be accessed in Synthetic Variables using the dot '.' operator.

```
{YOUR_VARIABLE}.timestamp
```

Example



Example:

Imagine you have a variable, like in the image above, storing a value every time a machine **TURNS ON** (1) or **TURNS OFF** (0), and you want to calculate how long the machine remains in an ON state (1). This calculation can be done using the variable timestamp as shown below:

```
1 previousValue = shift( machine-switch (machine1) , -1)
2 previousTime =shift( machine-switch (machine1) .timestamp,-1)
3 actualValue = machine-switch (machine1)
4 actualTime= machine-switch (machine1) .timestamp
5 dV = actualValue-previousValue
6 dT= actualTime-previousTime
7 where(dV==1, dT)
```

Where,

- `previousTime` : Timestamps in milliseconds when the machine was ON
- `actualTime` : Timestamps in milliseconds when the machine was OFF
- `dV` : Difference between actual and previous value to monitor if there was a change on the machine ON/OFF status.
- `dT` : Time the machine remains ON.

At last, one needs to evaluate on `dV`'s sign to check for a negative value, which in turn indicates the machine when from ON to OFF. To do so, there's the function `where()`, that based on an input condition, takes one of 2 actions for the `True` or `False` condition outcome. For the case herein, it serves well to evaluate the sign and if True, save the time difference between the last 2 states, that is, `dT`.

Keep in mind this time is in always in milliseconds [ms], if needed, you can convert it to seconds, minutes or hours multiplying for the correct factor.

Example of data range functions

Data range functions are a perfect fit to make statistical analysis to identify trends in a time period basis. With them, you will not only be able to calculate a value every fixed period of time but also have some flexibility to select the timestamp to which data will be stored, and an initial offset as well, if needed.

All data range functions follow the below syntax:

```
function_name(variable, data_range, position="start", offset=0)
```

where `function_name` and `data_range` can be any of the options described previously, `position` (optional) can be either of 2 options, `"start"` or `"end"`, which indicates whether value is going to be timestamped at the beginning or end of the `data_range`, and finally, the parameter `offset` (optional), as it suggest, shifts the starting point from where the function will compute.



The data ranges `"nW"`, `"nM"` and `"nY"` default to `position="end"` whereas the rest to `position="start"`.

Examples:

1.

```
mean(x, "1H")
```

The above synthetic expression calculates the `mean` of variable `x` every 1 hour (`"1H"`), and because none of the optional parameters are defined, the values will be timestamped beginning every hour, that is, all values received from 00:00:00 to 01:00:00 will be mean-aggregated into a single value timestamped at 00:00:00.

2.

```
mean(x, "1H", position="end")
```

Similarly to example 1., synthetic expression 2. will compute variable `x` mean value every hour but in this case, the engine, because of the `position="end"` parameter, will timestamp each value at the end of the data range, so for values received from 00:00:00 to 01:00:00, the mean-aggregated value is timestamped at 00:59:59.

3.

```
mean(x, "8H", offset=6)
```

Let's suppose you're working on a factory with the following shifts schedule: 6:00 AM – 2:00 PM, 2:00 PM – 10:00 PM and 10:00 PM – 6:00 AM. You'd like to average the variable `x` every 8 hours to match each shift duration. However, the synthetic engine, by default, starts computing at 00:00:00 and not at the beginning of every shift. Here's when the last parameter, `offset`, comes in handy. Making `offset=6` indicates the engine to start computing at 06:00:00 in periods of 8 hours, rendering 3 values per day timestamped at 06:00:00, 14:00:00 and 22:00:00.

4.

```
mean(x, "8H", position="end", offset=6)
```

Based on the same example as in 3. we have now make use of all the parameters. In this case, the synthetic will compute starting at 06:00:00 in an 8 hours period basis but because of the `position="end"` parameter, values will be timestamped at 13:59:59, 21:59:59 and 05:59:59 for the 6:00 AM, 2:00 PM and 10:00 PM shifts, respectively.



`Offset` parameter works only with values that evenly subdivide 1 day.

Examples of special Synthetic Functions

There are many instances where a Synthetic Expression involves 2 or more variable time-series, and for those cases, because of the way the Synthetic Variables engine is built, each of the values to be computed must have the same timestamp, otherwise, the engine won't compute or output unexpected results. Nevertheless, not always, if not most of the cases, the variables time-series won't comply to this rule. For such instances, it exists the `fill_missing()` function, which basically fills the gaps where there's a missing value in either of the variables time-series used within the expression. This function follows the below default syntax:

```
fill_missing(expression, first_fill="ffill", last_fill="None", fill_value="None")
```

where the only mandatory argument is `expression`. The others, `first_fill`, `last_fill` and `fill_value` are optional. Furthermore, the optional arguments `first_fill` and `last_fill` can take either of 3 values: `ffill` (forward_fill), `bfill` (back_fill) or `None`, and `fill_value` can be `None` or any other numerical value.

To better understand this function, let's suppose you have a set of variables that you want to sum up together. As you can see in the below table, the variables A, B, C and D don't have data in all of the timestamps, so `fill_missing()` function is needed to fill the gaps and ultimately perform the calculation. The examples from 1 to 4 are based on said table:

Time	A	B	C	D
07/12/2019 00:00:04	5	-	4	5
07/12/2019 00:00:03	3	2	3	4
07/12/2019 00:00:02	-	4	-	2
07/12/2019 00:00:01	4	3	5	-

Examples

1.

```
fill_missing(A + B + C + D)
```

By default, the `fill_missing()` expression makes the `first_fill` parameter as `ffill`, meaning that the function will fill the gaps forward, starting in a point where it has enough data to fill the gaps for all the involved series. The result would be as follows:

Time	A	B	C	D	Result
07/12/2019 00:00:04	5	2	4	5	16
07/12/2019 00:00:03	3	2	3	4	12
07/12/2019 00:00:02	4	4	5	2	15
07/12/2019 00:00:01	4	3	5	-	-

2.

```
fill_missing(A + B + C + D, first_fill="bfill")
```

On the other hand, the `first_fill` can also be set as a `bfill`. The gaps would be filled as shown below:

Time	A	B	C	D	Result
07/12/2019 00:00:04	5	-	4	5	-
07/12/2019 00:00:03	3	2	3	4	12
07/12/2019 00:00:02	3	4	3	2	12
07/12/2019 00:00:01	4	3	5	2	14

3.

```
fill_missing(A + B + C + D, first_fill="ffill", last_fill="bfill")
```

Let's suppose you need to fill all the gaps of the variables, in that case you'd need to set both `first_fill` and `last_fill` in the expression, rendering the following:

Time	A	B	C	D	Result
07/12/2019 00:00:04	5	2	4	5	16
07/12/2019 00:00:03	3	2	3	4	12
07/12/2019 00:00:02	4	4	5	2	15
07/12/2019 00:00:01	4	3	5	2	14

4.

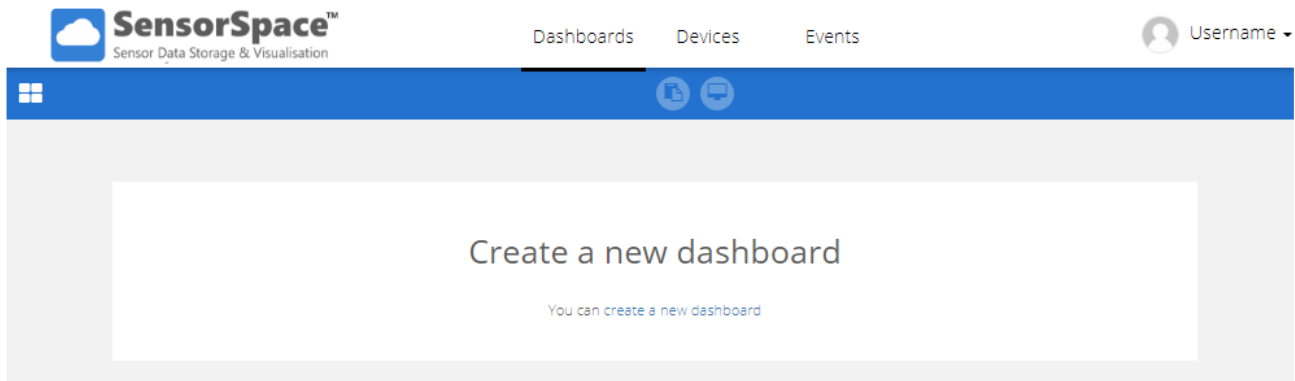
```
fill_missing(A + B + C + D, first_value=0)
```

Additionally, you can fill the gaps with a value. For this case, the function sets a "0" in all the gaps the variables have.

Time	A	B	C	D	Result
07/12/2019 00:00:04	5	0	4	5	14
07/12/2019 00:00:03	3	2	3	4	12
07/12/2019 00:00:02	0	4	0	2	6
07/12/2019 00:00:01	4	3	5	0	12


Dashboards

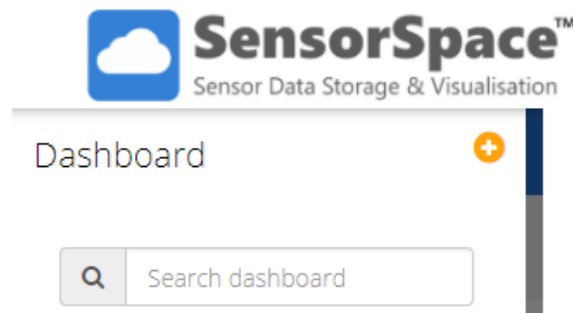
You arrive at this page by clicking **Dashboards** on the main menu bar at the top of the browser page. When no dashboards exist you will see a message displayed on the page.




You can click on the 'create new dashboard' link within this message to create a new dashboard or you can use the method that will *always* be available as follows:

Create New Dashboard

Click the Dashboard selection icon  in the top left of the window. This will always give you access to a list of all available dashboards. In this case there are no dashboards.



Click the  button to add a new dashboard. This opens the Add New Dashboard panel on the right of the window.

Add new Dashboard ×

General Information

Name: New Dashboard

Default time range: Last 24 hours

Dynamic Dashboard: ☒

Default device: Select Device

Resolution: Auto

Appearance

Floating widgets: ☐

Widgets opacity: 100

✓

Name	Enter the name for the dashboard.
Default Time Range	When you place widgets on the dashboard you can decide whether the data they display is from a fixed time span configured in the widget, or the timespan selected in the settings bar of the dashboard. This allows any or all of the widgets to be changed to display a certain time range by a single selection in the dashboard. This setting selects the initial time span when the dashboard is first displayed.
Dynamic Dashboard	Select whether this dashboard is static or dynamic. Leave enabled if you're creating a dynamic dashboard. Disable it if creating a static dashboard.
Default Device	This is only visible when Dynamic Dashboard is selected (Not when the dashboard is static). If dynamic dashboard is enabled, then select the default device displayed by dynamic widgets when the dashboard is first displayed.
Resolution	This choice affects how the widgets are resized to fit on the screen. If you choose Auto then as the browser resizes the widget will try and change in size to fill the browser window in the original arrangement. If you choose one of the fixed sizes the widgets will resize minimally as the browser window is resized. Depending on the type of dashboard, the type of widgets and how you want the browser window to behave you may need to experiment with these settings to achieve the best result.
Floating Widgets	Leave as Disabled if you want widgets to snap to each other. Enable if you want to have widgets "floating" in the user interface.
Widget Opacity	Change the opacity of the widgets to give further clarity to a dashboard; "0" is transparent, "100" is solid background.



Save the changes and return to the dashboard.

Dashboard Features


These features are common to all browsers.

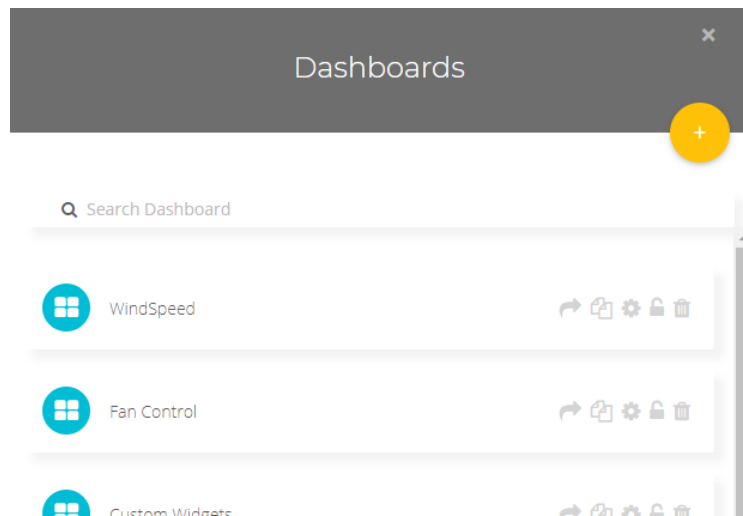
Settings Bar

The dashboard settings bar is displayed at the top of every dashboard and gives access to the dashboard selection list (If you are allowed access to this), the time span selector, real-time update control and the Add Widget button (If you are allowed access to this).



Dashboard Selection

When you view the dashboard list by clicking the  at the top left of the dashboard settings bar you will see that each dashboard has a set of menu icons to the right of it.



Share – This will pop up a window allowing you to copy a URL link to a public copy of this widget and an HTML snippet to embed this widget into your own web pages.

Share Dashboard ✕

WindSpeed

Public link

↪
<https://www.sensorspace.com/app/dashboards/public/dashboard/rAZRdCwPenM3C>
📄

Embed: Add the following snippet to your HTML

</>

```
<iframe width="100%" height="768" frameborder="0" src="https://www.sensorspace.com/app/dashboards/public/dashboard/rAZRdCwPenM3C"></iframe>
```

📄

Close



Duplicate / Replicate– Allows you to duplicate or replicate the dashboard. You will be asked to select a new device to replace the current one.

Both Duplicate and Replicate functionality creates a new Static Dashboard, the only difference is the host dashboard. While Duplicate uses a Static Dashboard as a starting point, Replicate copies from a Dynamic dashboard.

A new dashboard will be created with the same name but prefixed by "COPY-"



Settings – This will open the dashboard properties side panel that will be familiar from when the dashboard was first created. See [Create New Dashboard](#).



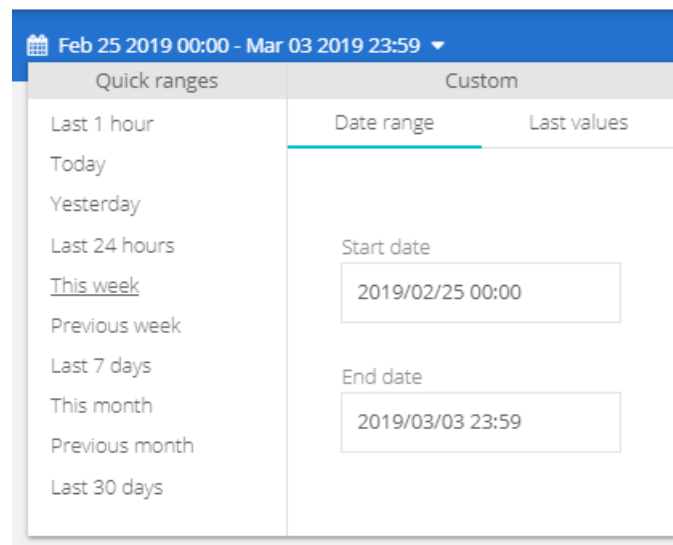
Lock – Lock or unlock the dashboard so that the widgets cannot be changed, edited or moved.



Delete – Delete the dashboard. You will be asked if you are sure.

Time Span Selection

The time span selector resides in the centre of the dashboard settings bar.



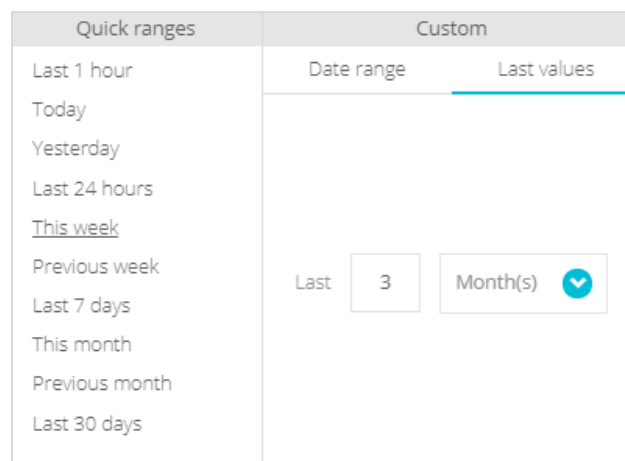
The screenshot shows a time span selection interface. At the top, a blue bar displays the date range 'Feb 25 2019 00:00 - Mar 03 2019 23:59' with a calendar icon and a dropdown arrow. Below this, there are two main sections: 'Quick ranges' and 'Custom'. The 'Quick ranges' section lists various pre-defined time spans: 'Last 1 hour', 'Today', 'Yesterday', 'Last 24 hours', 'This week' (which is underlined), 'Previous week', 'Last 7 days', 'This month', 'Previous month', and 'Last 30 days'. The 'Custom' section has two tabs: 'Date range' (which is highlighted with a blue underline) and 'Last values'. Under the 'Date range' tab, there are two input fields: 'Start date' with the value '2019/02/25 00:00' and 'End date' with the value '2019/03/03 23:59'.

You can select from a set of pre-defined timespans by clicking an item from the Quick Ranges section.

Alternatively you can enter a custom date range from the Custom section.

When Date Range is highlighted you can enter two desired dates.



If you select the Last Values option under Custom you can simply select a desired amount from the last minutes, hours, days or months.



This screenshot shows the same time span selection interface as the previous one, but with the 'Last values' tab selected under the 'Custom' section. The 'Date range' tab is no longer highlighted. In the 'Last values' section, there is a label 'Last' followed by a text input field containing the number '3', and a dropdown menu labeled 'Month(s)' with a blue downward arrow icon.

The selected time span will then be applied to all those widgets whose own timespan relies on the dashboard rather than their own fixed time spans.

Enable / Disable realtime

Clicking the  or  will disable or enable real-time update of the dashboard.

Add Widget



This button will be visible if your user is allowed to add widgets to the dashboard and the dashboard is not locked. See [Building a Dashboard](#)

Resizing Browser Window

When a dashboard is unlocked and you move or resize a widget, the whole placement of widgets on the dashboard is saved.

When the dashboard is viewed in another browser this layout will be attempted to be arranged but if the window is too narrow widgets will flow to the next row or otherwise be re-arranged.

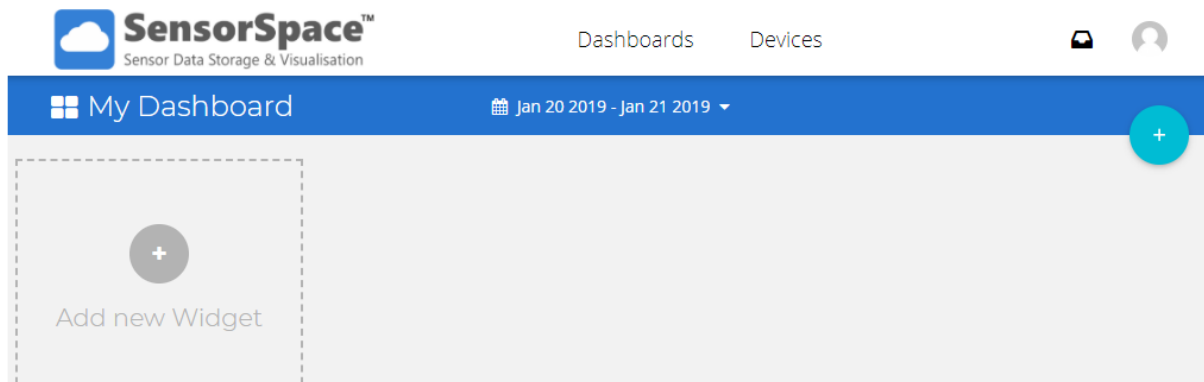
How the widgets behave will be influenced by the Resolution setting in the Dashboard Properties.

Even when viewed in portrait mode on a mobile phone the widgets will all be visible but will be stacked one above the other in a single column.


This will not affect your originally designed layout.

Building a Dashboard

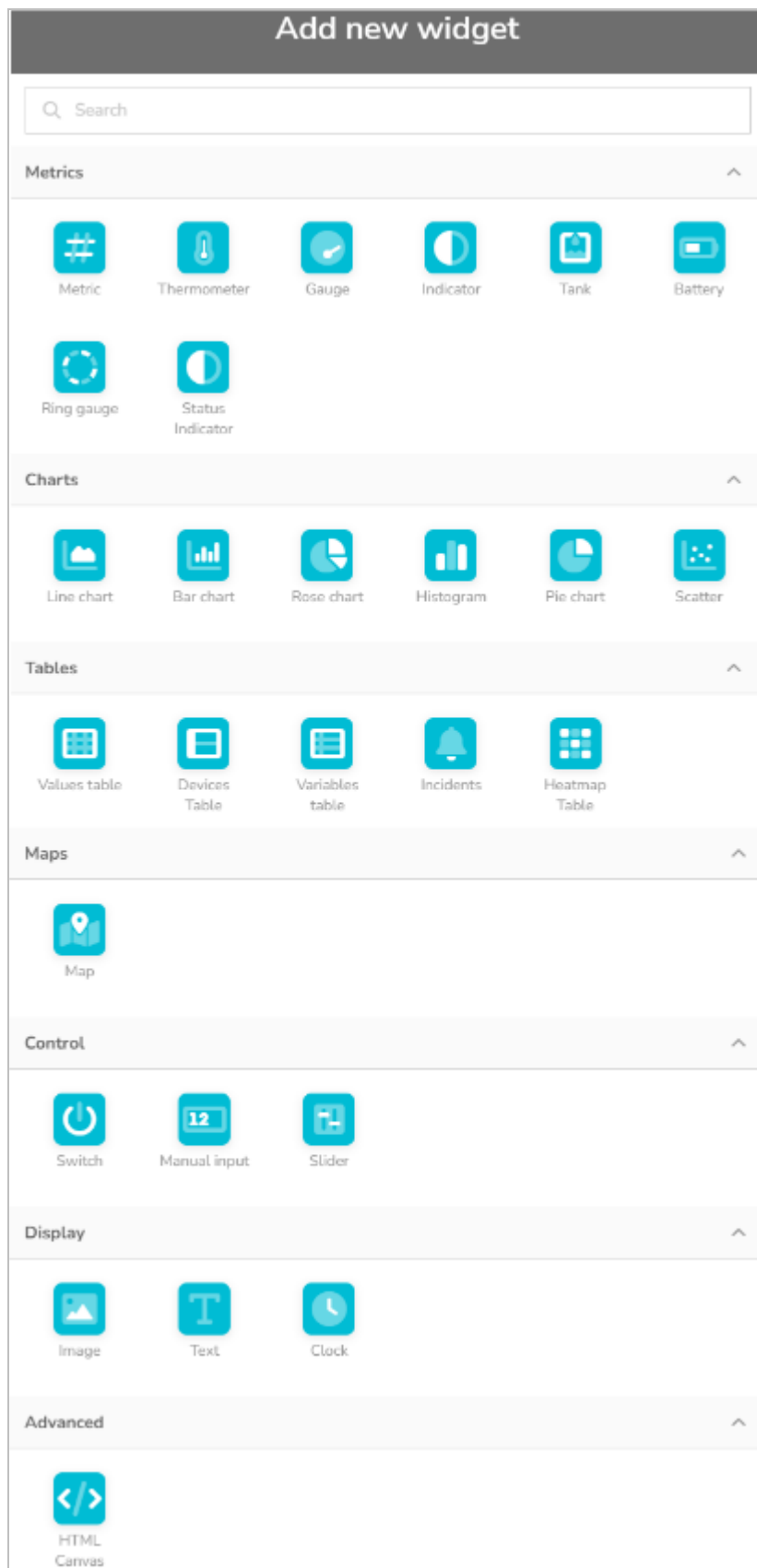
After you create and select a dashboard there will be no widgets to view so the page will look like this.



You create your dashboard by placing widgets on it and linking these widgets to your device or synthetic variables.

Click the  at the top right of the page.

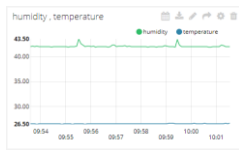
The right hand side of the window will display a list of widgets types you can add. Now you can select what type of widget to add to your dashboard.



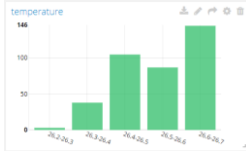
We are now going to describe all the widgets available. After that we will look at resizing and positioning the widgets on the dashboard.

Widgets

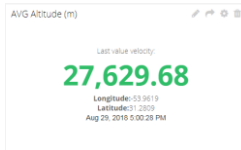
Line Chart



Histogram



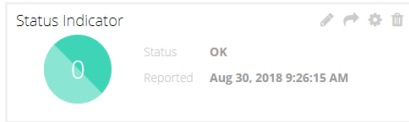
Metric



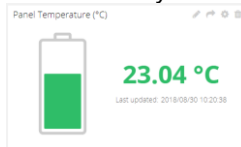
Variables Table

Date	average	gust	Peak 5 Minutes	Peak Hourly
August 30 2018 - 10:12:27	0.00	0.00	---	---
August 30 2018 - 10:11:56	0.25	1.12	---	---
August 30 2018 - 10:11:24	0.45	1.12	---	---
August 30 2018 - 10:10:54	0.83	1.12	---	---
August 30 2018 - 10:10:23	0.30	1.12	---	---

Status Indicator



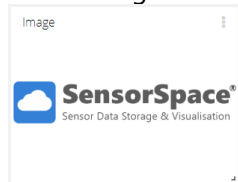
Battery



Clock



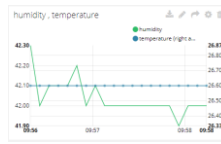
Image



Ring Gauge



Double Axis



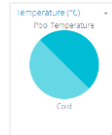
HTML Canvas

HTML canvas

Map



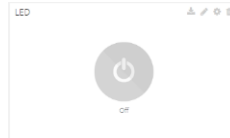
Indicator



Tank



Switch



Text

Text widget

New message

Manual Input

Manual input

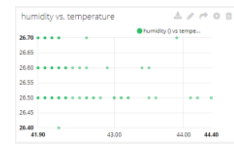
Value (renesas1_0005)

Send

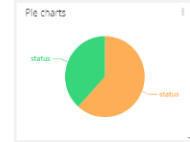
Heat Map



Scatter



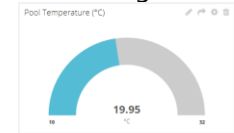
Pie



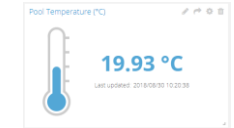
Values Table

Variable name	Date	Current value	Lat	Lon
distance	August 29 2018 - 17:00:28	6.00	---	---
Pool Temperature	August 30 2018 - 10:10:38	19.93	---	---
weight	December 12 2017 - 05:50:55	20.36	---	---

Gauge



Thermometer



Slider



Devices Table

Device name	Status	Lat	Longitude	Last Activity
mpg1000001-SS Device	---	---	---	May 28 2018 07:58
mpg1000002-SS Device	---	---	---	May 28 2018 11:24
mpg1000003-SS Device	---	---	---	Apr 18 2018 12:27
mpg1000004-SS Device	---	---	---	May 28 2018 07:58
mpg1000005-SS Device	---	---	---	May 28 2018 10:38

Rose Chart



Line Chart

The Line Chart displays one or more variables as traces on a single chart and can support multiple Y axes. Traces can be applied to a specific axis.

Add a Line Chart Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

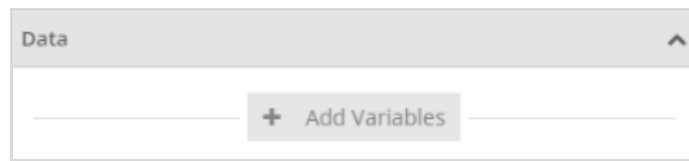
The screenshot shows a mobile application interface for configuring a 'Line chart' widget. The panel has a dark header with the title 'Line chart' and a close button. Below the header is a 'BACK' button. The main content is divided into two sections: 'Data' and 'Appearance'. The 'Data' section includes an 'Add Variables' button. The 'Appearance' section contains various settings: 'Name' (set to 'Chart'), 'Decimal points' (set to 'Auto'), 'Show legend' (toggle off), 'Date format' (set to 'Oct 26 2022 11:02'), 'Display X-Axis data zoom' (toggle on), and 'X-axis label' (set to 'None'). Below these is a 'Default Y-axis' section with a dropdown arrow. It includes 'Y-axis name' (set to 'None'), 'Position' (set to 'Left'), 'Y-axis range' (with 'Min: A' and 'Max: /' inputs), 'Use SI prefix' (toggle off), 'Hide values' (toggle off), and 'Labels and horizontal lines' (with an 'Edit labels and lines' button). At the bottom of the 'Default Y-axis' section is an 'Add new Y-axis' button. A green checkmark button is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

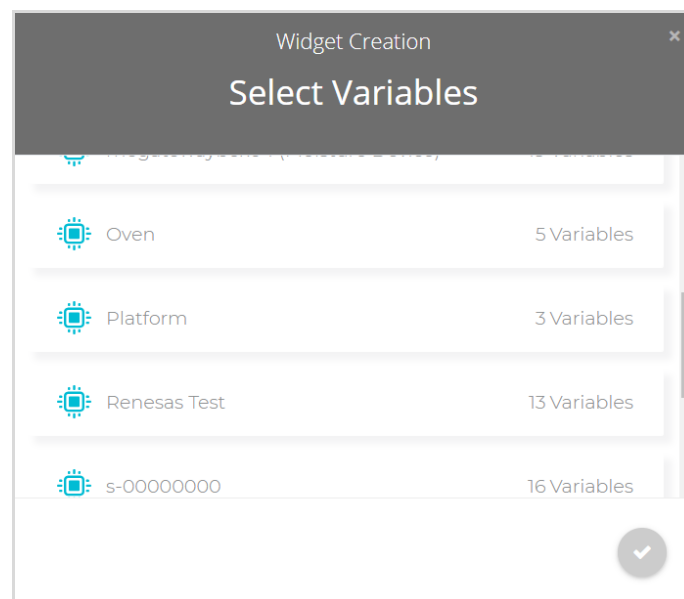
Static Dashboard

When placed on a static dashboard

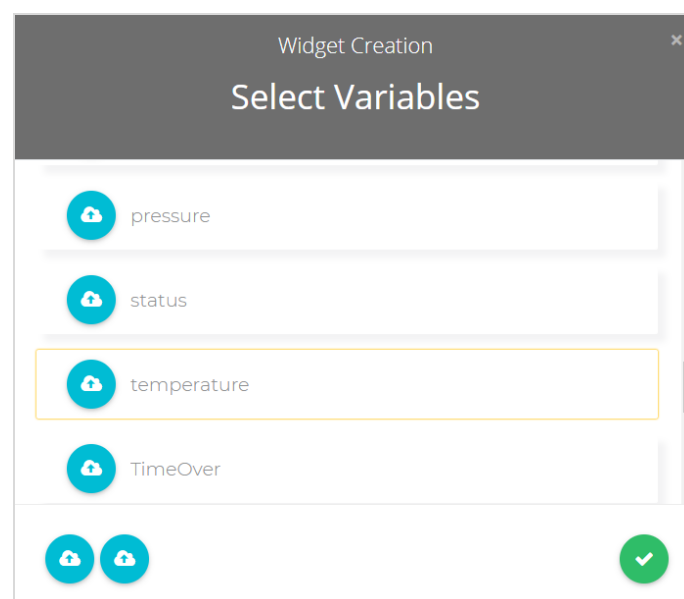



Click Add Variables to add variables (traces) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables for selection.



Click the  to close the pop-up to return to the property panel.

Data

Temperature (megatewaybox04 (Moisture Device))

Aggregation method

Last value

Span

Set by dashboard

Type

Line

Y-Axis

Default Y-axis

Moisture (megatewaybox04 (Moisture Device))

Aggregation method

Last value

Span

Set by dashboard

Type

Line

Y-Axis

Default Y-axis

+ Add Variables

You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variable** again to add more variables.

To change the colour of the trace for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#)

You can also see additional options against **each** variable.

Aggregation Method – Select how the data points from the variable will be displayed. You can choose from Average, Count, Maximum, Minimum, Raw and Sum. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display each point on the chart as an average of all data received over the specified Span. The span can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar. i.e. if the sample period is set to 5 minutes and the dashboard time span was set to Last Hour then the chart will show 12 data points where each plotted point represents the average of all the data received for the variable for that 5 minute period.
<i>Minimum</i>	Span	Display each point on the chart as the minimum value of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Maximum</i>	Span	Display each point on the chart as the maximum value of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Sum</i>	Span	Display each point on the chart as the sum of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Count</i>	Span	Display each point on the chart as a total count of the number of values received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Last Value</i>	Span	Display all the data points for either Last Values where you enter the number of data points to display, or Set By The Dashboard so the dashboard setting determines the timespan of the X axis.



*The time span of the X axis of the chart will be set by the time span selected in the dashboard's settings bar unless **all** variables in the widget are Last Value aggregated and the Span is set to Last Values. Then the X axis is fixed by the variable with the largest time spanned by the specified number of most recent values or time span.*

Span

When Last Values is selected, instead of Set By Dashboard, for the Span setting the following options are available.

Data

Moisture (megatewaybox04 (Moisture Device))

Aggregation method

Last value

Span

Last values

Display the last

500

Value(s)

Minute(s)

Hour(s)

Day(s)

Month(s)

Value(s)

Type

Line

Y-Axis

Default Y

Temperature (megatewaybox04 (Moisture Device))

Value(s)

Display the Last

Choose from Values, Minutes, Hours, Days or Months and enter the required value.

Type

Choose from Bars, Line, Dots or Step. This selects how the variable trace is displayed.

Type

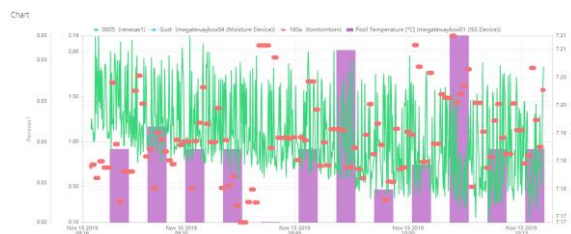
Line

Bars

Line

Dots

Step



Y-Axis

Select one of the Y axes to plot this variable against. If no other Y axes have been added the default will be Default Y-Axis

When placed on a dynamic dashboard this option will be visible.

The screenshot shows a configuration panel for a 'Data' widget. At the top, the title 'Data' is followed by an upward arrow. Below this, the 'Widget behavior' is set to 'Dynamic' with a dropdown arrow. At the bottom, there is a button labeled '+ Add Variables'.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

The screenshot shows the 'Data' widget configuration panel with 'Widget behavior' set to 'Dynamic'. Below this, there is a section for 'Label' with a placeholder text 'Type a label'. Further down, there are four rows of configuration options, each with a dropdown menu: 'Aggregation method' set to 'Last value', 'Span' set to 'Set by dashboard', 'Type' set to 'Line', and 'Y-Axis' set to 'Default Y-axis'. At the bottom, there is a button labeled '+ Add Variables'.

Simply click where it says Type a Label and enter the label name.

The screenshot shows the 'Data' widget configuration panel with 'Widget behavior' set to 'Dynamic'. The 'Label' field now contains the text 'Ch1'. The 'Aggregation method' dropdown is still set to 'Last value'. The '+ Add Variables' button is at the bottom.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variable** again to add more variables.

To change the colour of the trace for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

You can also see additional options against **each** variable.

See the [Static Dashboard](#) section for the description of the other settings.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance

Name

Chart

Decimal points

Auto

Show legend

Date format

Oct 26 2022 11:02

Display X-Axis data zoom

X-axis label

None

Default Y-axis

Y-axis name

None

Position

Left

Y-axis range

Min: A

Max: /

Use SI prefix

Hide values

Labels and horizontal lines

Edit labels and lines

Add new Y-axis

Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Decimal Points Enter the number of decimal places to show for variable values in the information bar when the mouse is hovered over the chart.

Show Legend Only available when Line is selected as the Chart Type. Enable this option to display the variable description, units and source device above the chart. This also allows traces to be

toggled on and off by clicking on the legend.

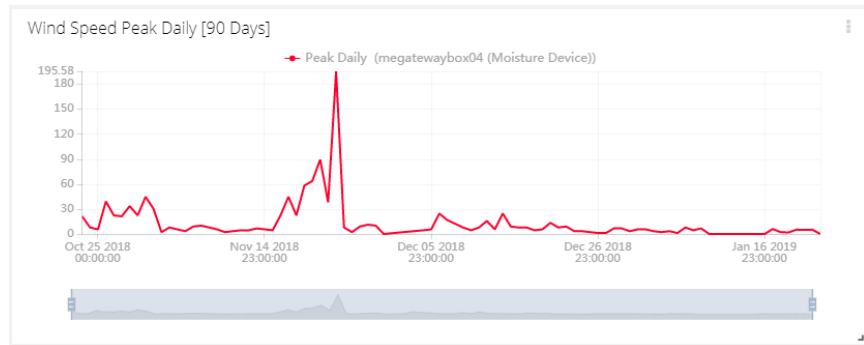
Date Format

Select the required data format to be displayed on the widget.

Display X-axis Data Zoom

Only available when Line is selected as the Chart Type. Enable this option to display a navigation bar beneath the chart.

The navigation bar initially displays the full, original X axis span of the chart overlaid with the first variable trace visible.



You can click and drag the handles at each end of the bar to zoom in on data of interest.



As you drag the handles the time and date at each end of the selected view will be displayed. Drag the middle of the selection to pan the view left and right.



Selecting a new timespan from the dashboard setting bar will reset all navigation zoom bars to the full extent of each charts X axis.

X-axis Label

Enter the label to appear against the X axis.

The following section is repeated for each additional Y axis that is added. Initially only the Default Y-axis exists.

Y-axis Name

Enter a name to appear against the Y axis and to identify this axis when selecting from a list for each variable.

Position

Choose either Left or Right to set which side of the chart the axis appears.

Y-axis range Min

Enter the minimum value for the Y axis or leave blank to automatically scale..

Y-axis range Max

Enter the maximum value for the Y axis or leave blank to automatically scale.

Use SI Prefix

Use SI units for thousands etc so instead of 1000 the axis would show 1K.

Hide Values

Select to hide numeric values on Y axis.

Labels and horizontal lines

Click Edit labels and lines to open a new dialog box to allow you to add custom lines and labels to the chart.

Click Add Y Label to add a new row where you can enter the Y axis value, label, line style and colour of the line.

Temperature

×

Edit Y-labels

Value	Y-Axis text	Horizontal line	Line color	
15	OK	Dashed ▾	<div>#00bcd4</div>	<div>🗑</div>
11	MIN	Dotted ▾	<div>#4455a3</div>	<div>🗑</div>
17	MAX	Dotted ▾	<div>#f44336</div>	<div>🗑</div>

+ ADD Y-LABEL

CANCEL

ACCEPT

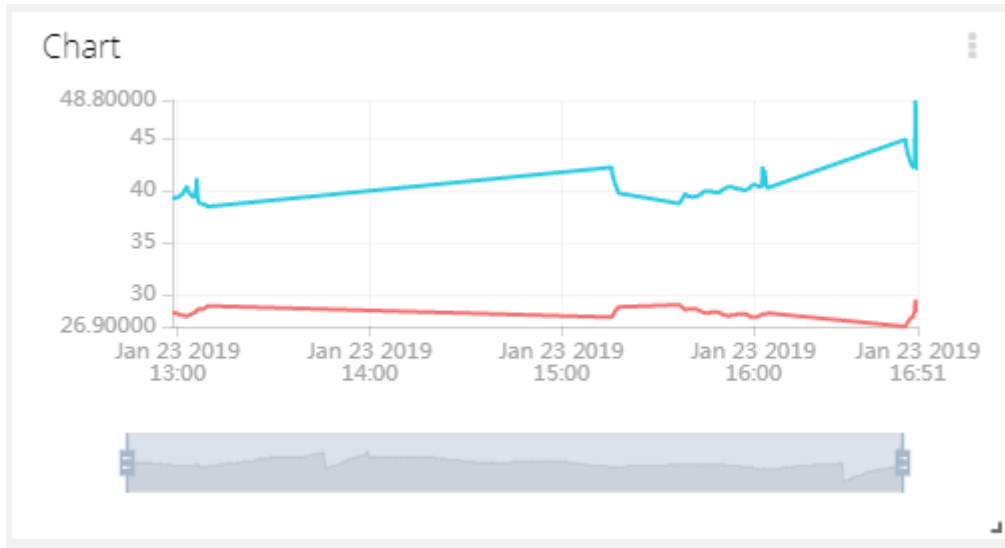
Add New Y-Axis

Create a new Y axis that contains all the above settings. This new axis can then be selected to be used for any of the variables.

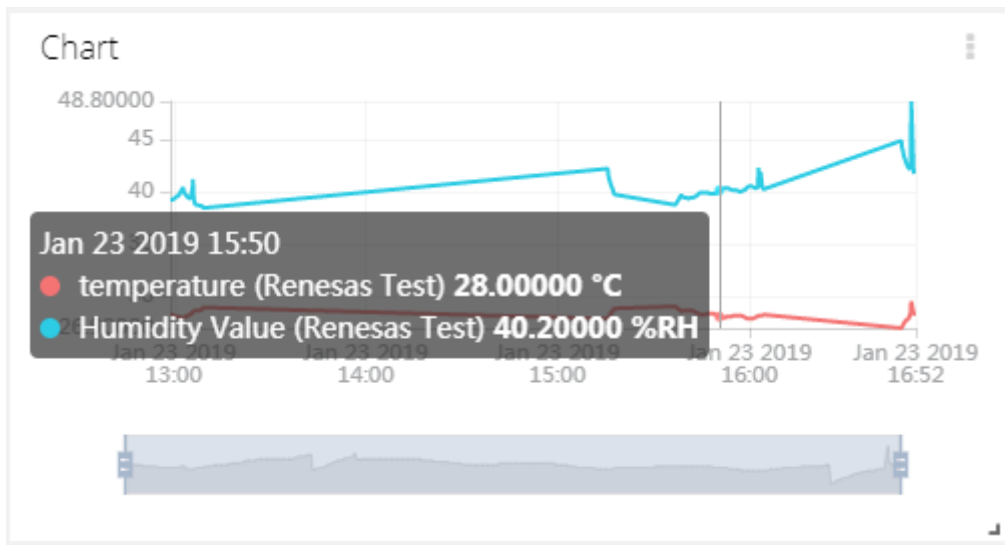


Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the chart displays a panel showing the device name, variable name, value and unit for each variable.

The data zoom bar below the chart (If enabled) can be used to zoom into the chart data.

The legends above the chart (If enabled) can be clicked to toggle the visibility of traces.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Double Axis

This widget shows two variables on the same chart but with different Y axis scales.

Add a Double Axis Widget to display the property panel on the right of the screen.



Note that the Double Axis widget is now redundant and may be retired soon. The Line Chart now supports multiple axes.

Property Panel

The property panel has two sections; Data and Appearance.

The screenshot shows the 'Double axis' property panel. It has a title bar with a close button. Below the title bar is a 'BACK' button. The panel is divided into two main sections: 'Data' and 'Appearance'. The 'Data' section contains two buttons: 'Add left axis variable' and 'Add right axis variable'. The 'Appearance' section contains various settings: 'Name' (Double Axis), 'Left Y-axis range' (Min: Aut, Max: Aut), 'Left Y-axis label' (None), 'Decimal points' (Auto), 'Right Y-axis range' (Min: Aut, Max: Aut), 'Right Y-axis label' (None), 'Decimal points' (Auto), 'X-Axis label' (None), 'Date format' (Feb 27 2019 08:56), 'Visualize as a step line chart' (toggle off), 'Show legend' (toggle off), and 'Display X-Axis data zoom' (toggle on). A green checkmark button is at the bottom right.

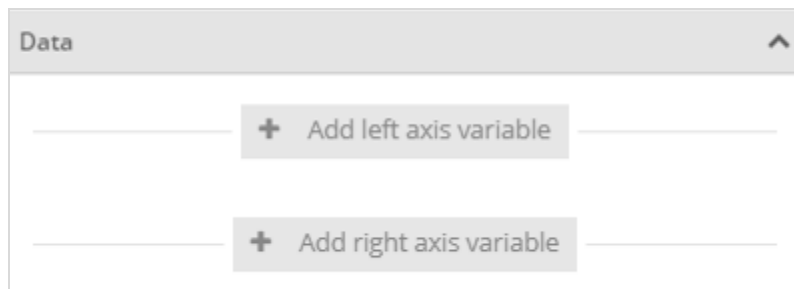
Section	Property	Value
Data	Add left axis variable	+ Add left axis variable
	Add right axis variable	+ Add right axis variable
Appearance	Name	Double Axis
	Left Y-axis range	Min: Aut, Max: Aut
	Left Y-axis label	None
	Decimal points	Auto
	Right Y-axis range	Min: Aut, Max: Aut
	Right Y-axis label	None
	Decimal points	Auto
	X-Axis label	None
	Date format	Feb 27 2019 08:56
	Visualize as a step line chart	Off
	Show legend	Off
Display X-Axis data zoom	On	

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

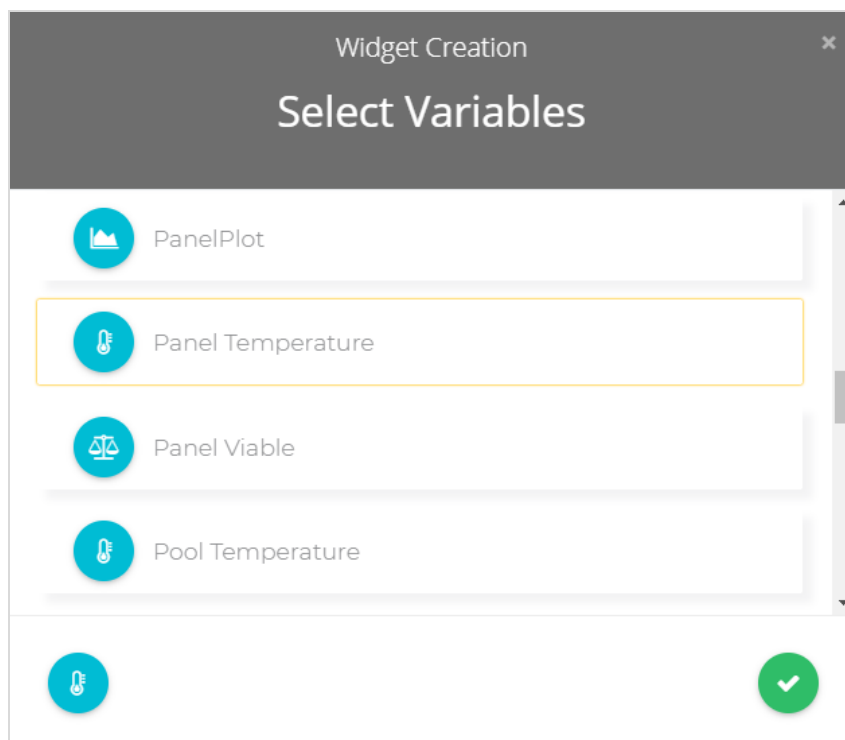
Static Dashboard

When placed on a static dashboard




Click Add Left Axis Variable and Add Right Axis Variable to add variables (traces) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select a single variable from any devices.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select one variable for each of the chart's axes.

Click the  to close the pop-up to return to the property panel.



You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. To replace a variable just delete it and select another one.

To change the colour of the trace for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#)



The time span of the X axis of the chart will be set by the time span selected in the dashboard's settings bar.

When placed on a dynamic dashboard this option will be visible.


The screenshot shows a configuration panel titled 'Data'. Under 'Widget behavior', a dropdown menu is set to 'Dynamic'. Below this, there are two empty input fields. The first field has a button labeled '+ Add left axis variable' and the second field has a button labeled '+ Add right axis variable'.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Left/Right Axis Variable a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the currently selected device.)

The screenshot shows the same configuration panel as before, but now with a variable entry. It features an orange square icon, the text 'Label: Type a label', and the '+ Add right axis variable' button. The 'Widget behavior' dropdown remains set to 'Dynamic'.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. To change the colour of the trace for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance

Name

Double Axis

Left Y-axis range

Min: Aut

Max: Aut

Left Y-axis label

None

Decimal points

Auto

Right Y-axis range

Min: Aut

Max: Aut

Right Y-axis label

None

Decimal points

Auto

X-Axis label

None

Date format

Feb 27 2019 08:56

Visualize as a step line chart

Show legend

Display X-Axis data zoom

There is only one appearance setting here.

- Name**

Enter the title of the widget to appear at its top left when displayed on the dashboard.
- Left Y-axis range**

Enter the required values for the Min and the Max or leave blank to auto scale..
- Left Y-axis Label**

Enter the label to appear against the left Y axis.
- Decimal Points**

Enter the number of decimal places to show for the first variable values in the information bar when the mouse is hovered over the chart and on the left axis itself. Leave blank to auto select.
- Right Y-axis**

Enter the required values for the Min and the Max or leave blank to auto scale..

range

Right Y-axis

Label

Decimal Points

Enter the label to appear against the right Y axis.

Enter the number of decimal places to show for the second variable values in the information bar when the mouse is hovered over the chart and on the right axis itself. Leave blank to auto select.

X-axis Label

Enter the label to appear against the X axis.

Date Format

Select the required data format to be displayed on the widget.

**Visualize as a
Step Line Chart**

Enable this option to draw the line as a series of steps rather than a continuous line.

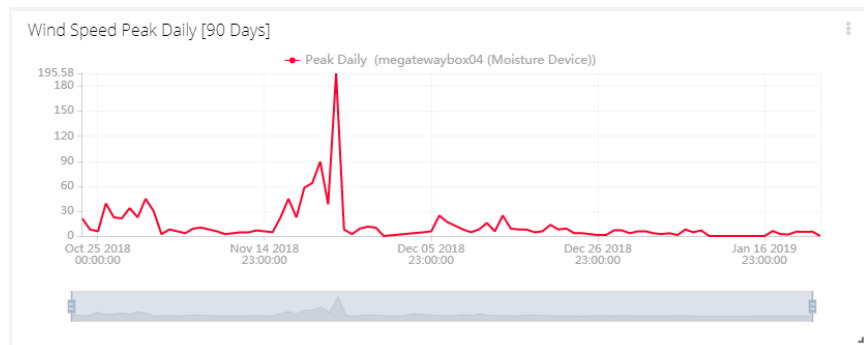
Show Legend

Enable this option to display the variable description, units and source device above the chart. This also allows traces to be toggled on and off by clicking on the legend.

**Display X-axis
Data Zoom**

Enable this option to display a navigation bar beneath the chart.

The navigation bar initially displays the full, original X axis span of the chart overlaid with the first variable trace visible.



You can click and drag the handles at each end of the bar to zoom in on data of interest.



As you drag the handles the time and date at each end of the selected view will be displayed. Drag the middle of the selection to pan the view left and right.

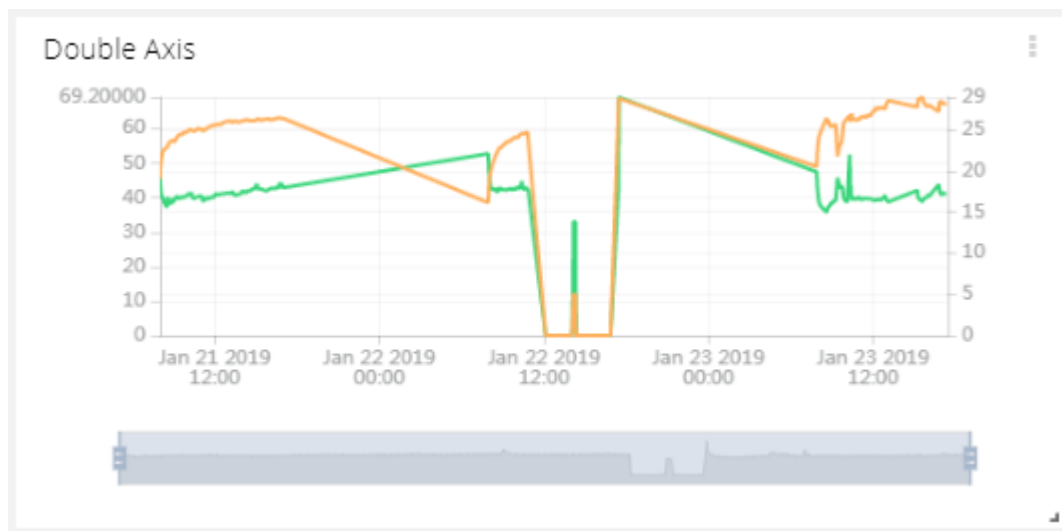


Selecting a new timespan from the dashboard setting bar will reset all navigation zoom bars to the full extent of each charts X axis.



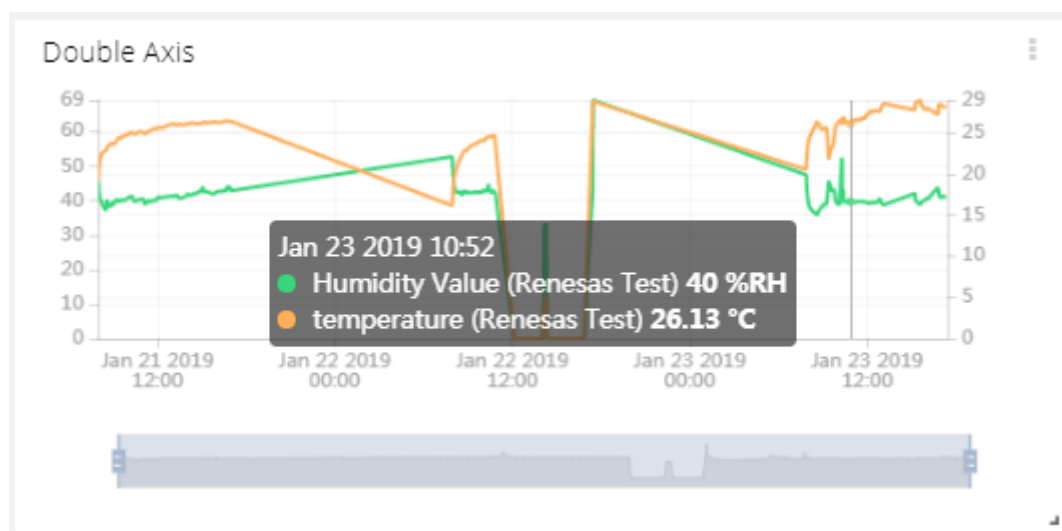
Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



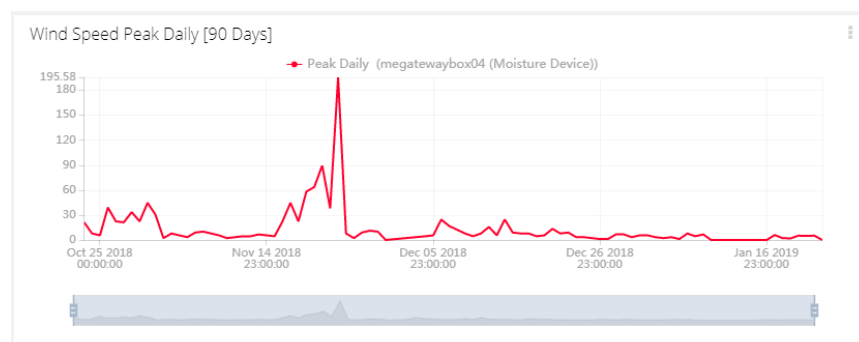
When viewed on the dashboard the Double Axis widget indicates the amount each variable contributes to the total of all the variables values.

Dashboard Actions



Hovering the mouse pointer over the chart displays a panel showing the device name, variable name, value and unit for each variable.

The data zoom bar below the chart can be used to zoom into the chart data. The zoom bar initially displays the full, original X axis span of the chart overlaid with the first variable trace visible.



You can click and drag the handles at each end of the bar to zoom in on data of interest.



As you drag the handles the time and date at each end of the selected view will be displayed. Drag the middle of the selection to pan the view left and right.



Selecting a new timespan from the dashboard setting bar will reset all navigation zoom bars to the full extent of each charts X axis.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Scatter Plot

This type of chart allows you to plot two variables against each other, even if they arrive with different time-stamps. Depending on your application, it can be quite handy to analyze things like:

- Temperature vs. Humidity
- Pressure vs Temperature
- AC Energy Consumption vs Ambient Temperature
- RPM vs Torque
- Signal Strength vs Relative Position

Add a Scatter Widget to display the property panel on the right of the screen.

Property Panel

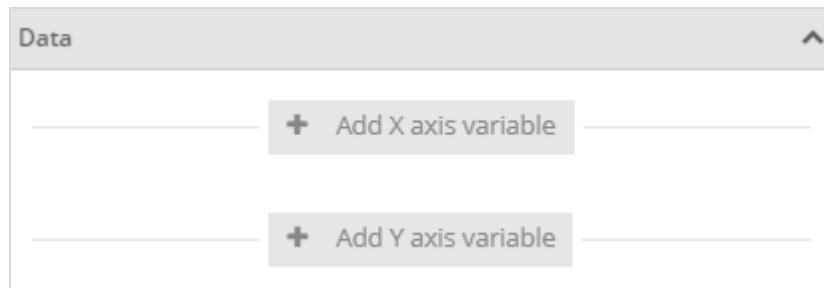
The property panel has two sections; Data and Appearance.

The screenshot shows the 'Scatter' widget's property panel. At the top is a dark header with the title 'Scatter' and a close button. Below is a 'BACK' button. The panel is divided into two main sections: 'Data' and 'Appearance'. The 'Data' section contains two input fields with '+ Add X axis variable' and '+ Add Y axis variable' buttons. The 'Appearance' section contains several settings: 'Name' (set to 'Scatter'), 'Y-axis range' (with 'Min: Auto' and 'Max: Auto' buttons), 'Y-axis label' (set to 'None'), 'Decimal points' (set to 'Auto'), 'X-Axis label' (set to 'None'), 'Show legend' (a toggle switch), and 'Display X-Axis data zoom' (a toggle switch). A large green checkmark button is at the bottom right.

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

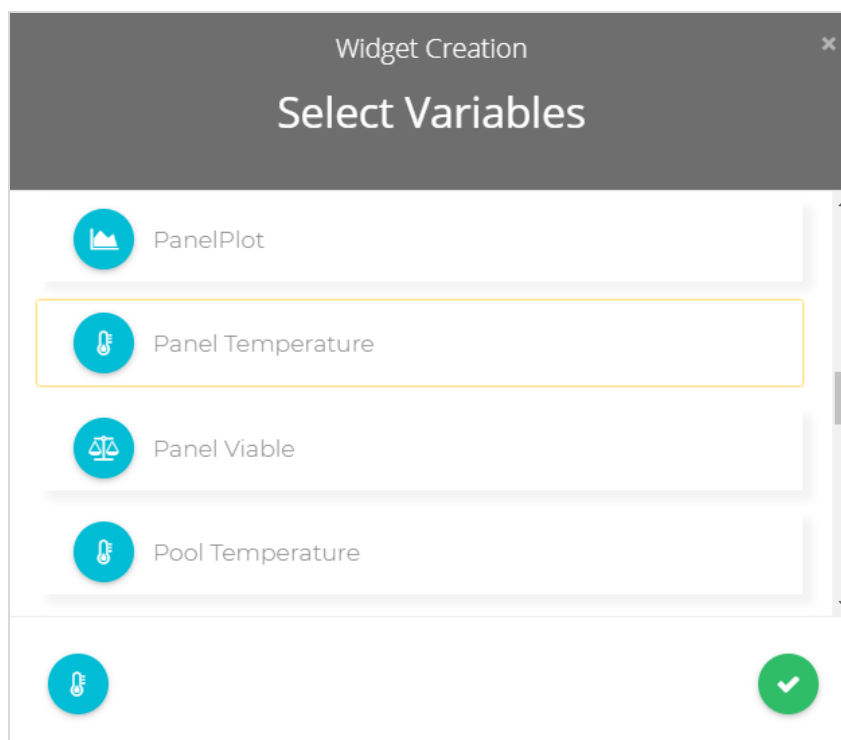
Static Dashboard

When placed on a static dashboard




Click Add X Axis Variable and Add Y Axis Variable to add variables to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select a single variable from any devices.

Click on a device to expand the list to show the variables contained in that device.




As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select one variable for each of the chart's axes.

Click the  to close the pop-up to return to the property panel.



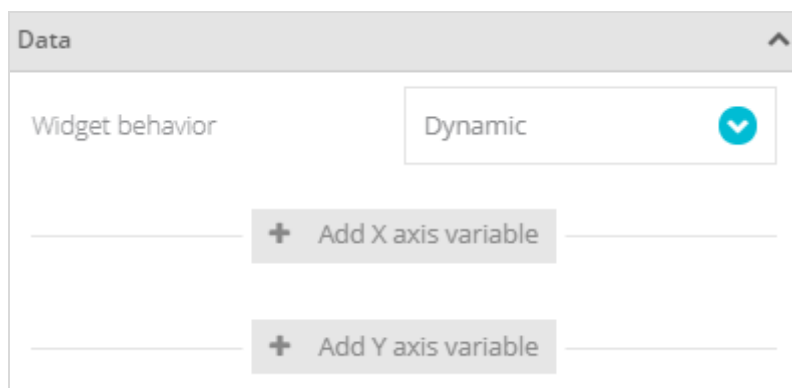
You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. To replace a variable just delete it and select another one.
Colours are ignored in this widget.



The time span of the X axis of the chart will be set by the time span selected in the dashboard's settings bar .

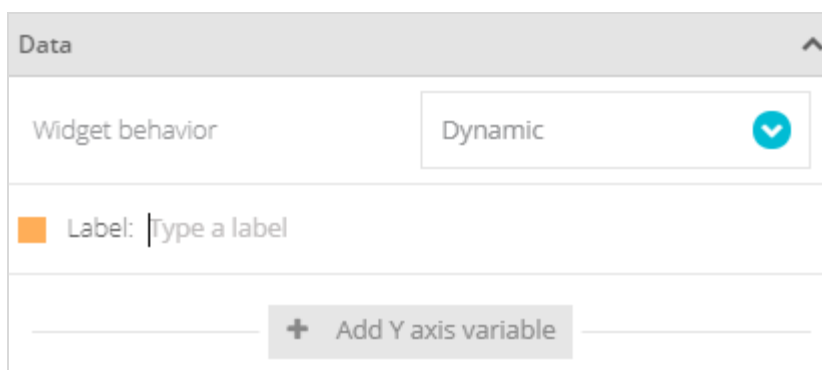
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a configuration panel titled 'Data' with a collapse arrow in the top right. Inside, the 'Widget behavior' is set to 'Dynamic' with a dropdown arrow. Below this are two buttons: '+ Add X axis variable' and '+ Add Y axis variable', each preceded by a horizontal line for text input.


Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



This screenshot shows the 'Data' configuration panel with 'Widget behavior' set to 'Dynamic'. Below the behavior selector, there is a section for adding variables. It starts with an orange square icon, followed by the text 'Label: |Type a label'. Below this is a button '+ Add Y axis variable' preceded by a horizontal line for text input.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. Variable colour selection is ignored for this widget.

See the [Static Dashboard](#) section for the description of the **Aggregation Method** and **Span settings**.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

The screenshot shows the 'Appearance' configuration window for a widget. The window has a title bar 'Appearance' with an upward arrow icon. The settings are as follows:

- Name:** Scatter (with a small blue icon)
- Y-axis range:** Min: Auto, Max: Autc
- Y-axis label:** None
- Decimal points:** Auto
- X-Axis label:** None
- Show legend:** Toggle switch is off
- Display X-Axis data zoom:** Toggle switch is on

At the bottom right of the panel is a large green circular button with a white checkmark, indicating that the settings are saved or confirmed.

There is only one appearance setting here.

Name	Enter the title of the widget to appear at its top left when displayed on the dashboard.
Y-axis range	Enter the required values for the Min and the Max or leave blank to auto scale..
Y-axis Label	Enter the label to appear against the left Y axis.
Decimal Points	Enter the number of decimal places to show for the first variable values in the information bar when the mouse is hovered over the chart and on the left axis itself. Leave blank to auto select.
X-axis Label	Enter the label to appear against the X axis.
Show Legend	Enable this option to display the variable description, units and source device above the chart. This also allows traces to be toggled on and off by clicking on the legend.
Display X-axis Data Zoom	Enable this option to display a navigation bar beneath the chart. The navigation bar initially displays the full, original X axis span of the chart overlayed with the first variable trace visible.



You can click and drag the handles at each end of the bar to zoom in on data of interest.



As you drag the handles the time and date at each end of the selected view will be displayed. Drag the middle of the selection to pan the view left and right.

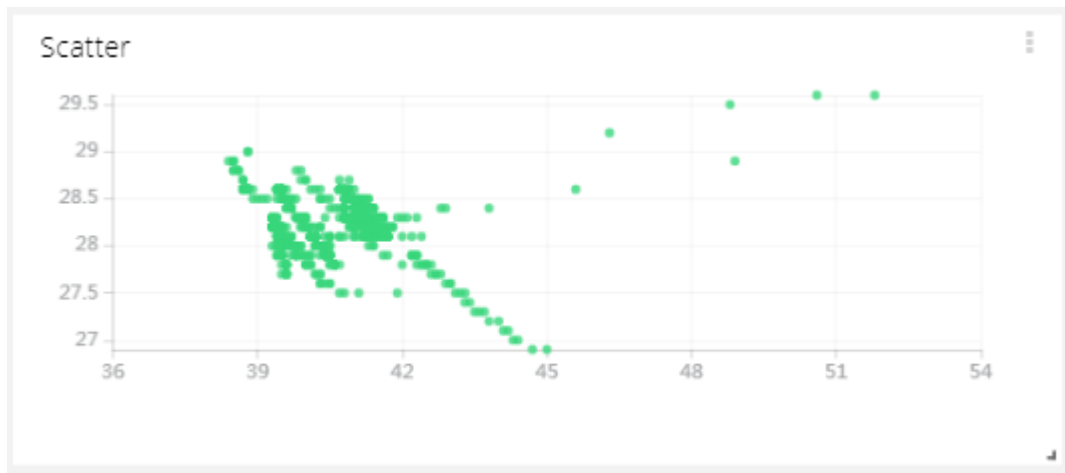


Selecting a new timespan from the dashboard setting bar will reset all navigation zoom bars to the full extent of each charts X axis.



Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

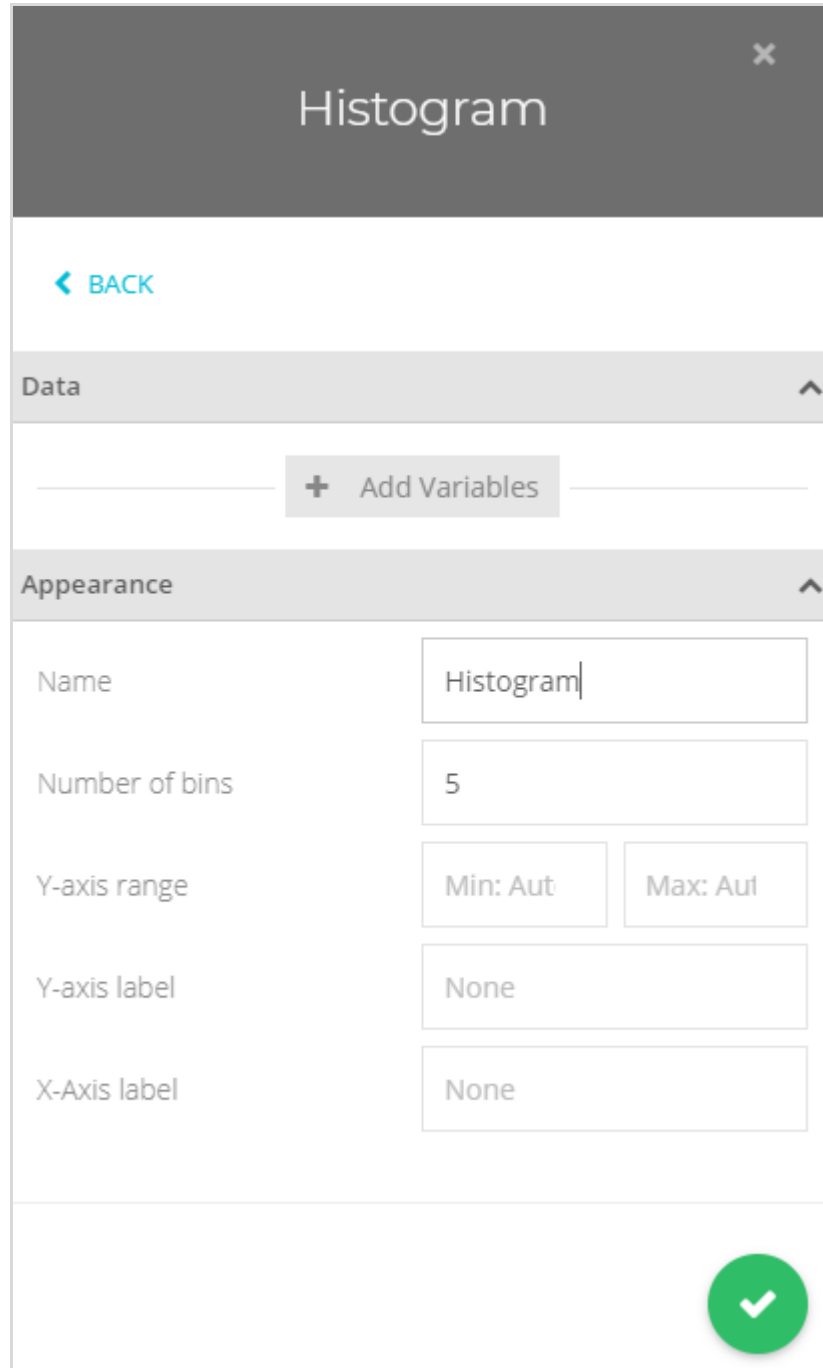
Histogram

Histograms show the frequency (or count) of values in a set of ranges. After selecting this widget you get to select the device.

Add a Histogram Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.



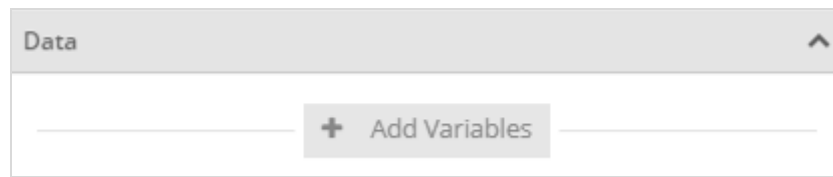
The screenshot shows the 'Histogram' property panel. At the top is a dark grey header with the title 'Histogram' and a close button (X). Below the header is a white bar with a blue 'BACK' button. The panel is divided into two main sections: 'Data' and 'Appearance', each with a grey header and an expand/collapse arrow. The 'Data' section contains a text input field and a '+ Add Variables' button. The 'Appearance' section contains several configuration options: 'Name' (text input with 'Histogram'), 'Number of bins' (text input with '5'), 'Y-axis range' (two buttons: 'Min: Aut' and 'Max: Aut'), 'Y-axis label' (text input with 'None'), and 'X-Axis label' (text input with 'None'). A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

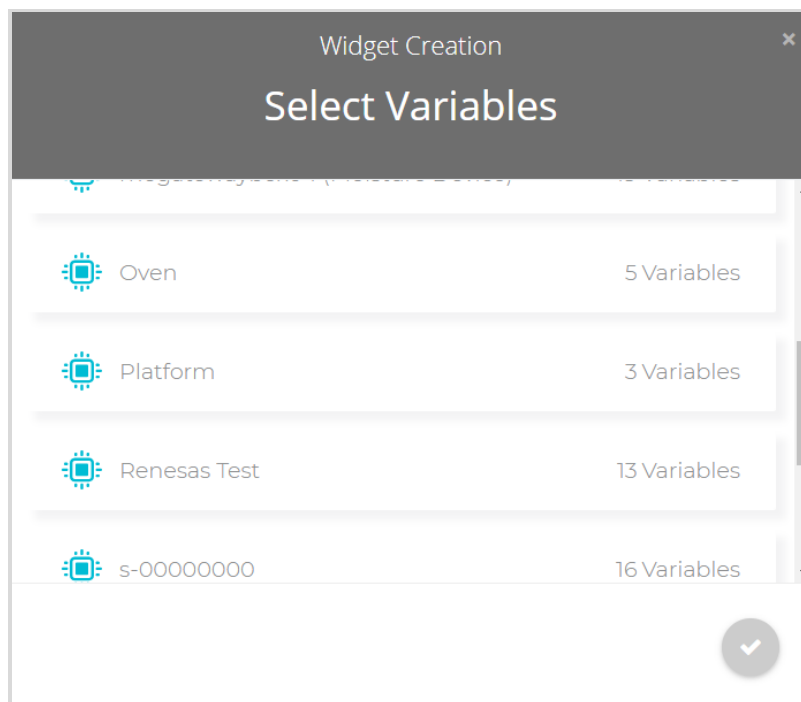
Static Dashboard

When placed on a static dashboard

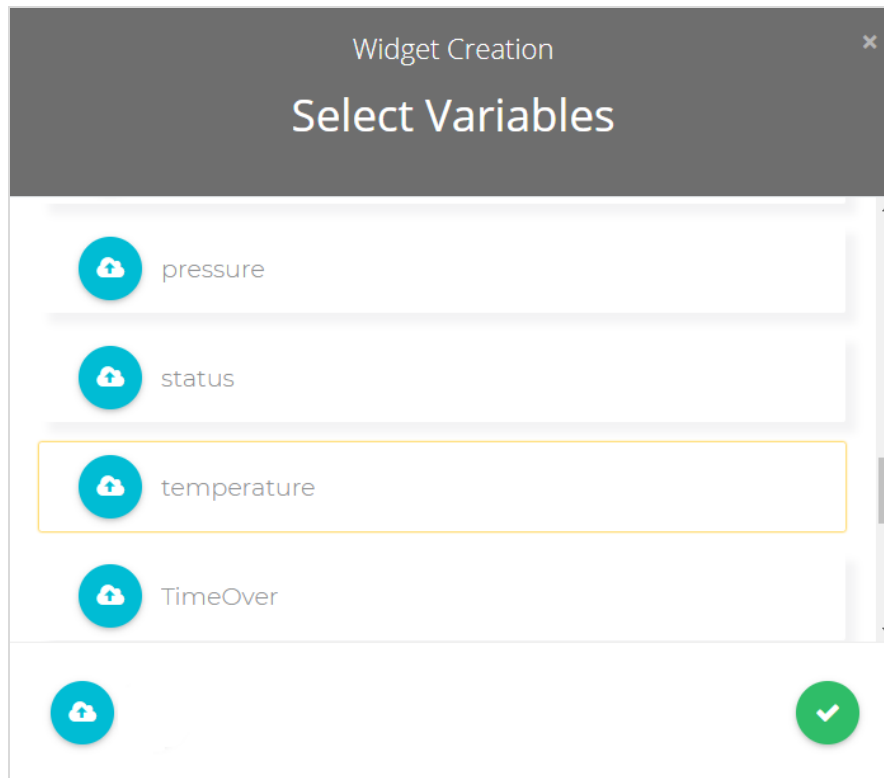



Click Add Variables to add variables (traces) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select a single variable from any of your devices.

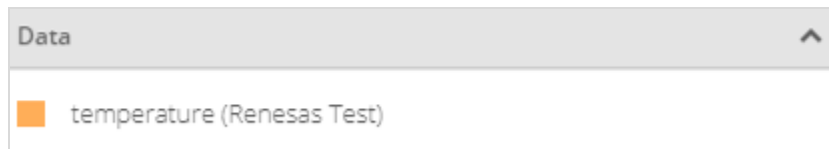
Click on a device to expand the list to show the variables contained in that device.




As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select a single variable for this widget.



Click the  to close the pop-up to return to the property panel.



You can now see the variable you selected added.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. To change the colour of the trace for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#)



The time span of the data contained in the chart will be set by the time span selected in the dashboard's settings bar.

When placed on a dynamic dashboard this option will be visible.


The screenshot shows a configuration panel titled 'Data'. Inside, there's a section labeled 'Widget behavior' with a dropdown menu currently showing 'Dynamic'. Below this, there is a grey button with a plus icon and the text '+ Add Variables'.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

This screenshot shows the same configuration panel as before, but with an additional row at the bottom. This row starts with a small orange square, followed by the text 'Label: |Type a label', indicating where to enter a variable label name.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.


To change the colour of the bins for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

Appearance Properties

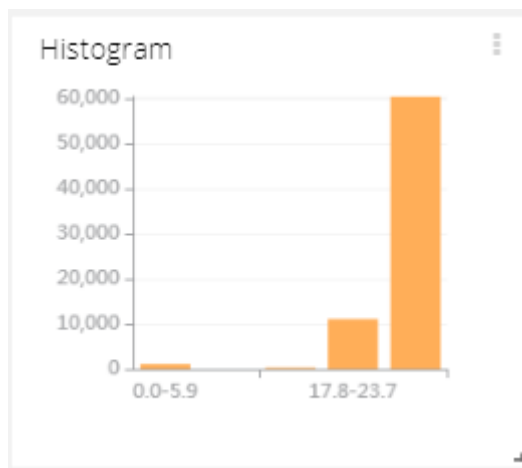
This section is the same regardless of whether the widget is static or dynamic.

Appearance ^

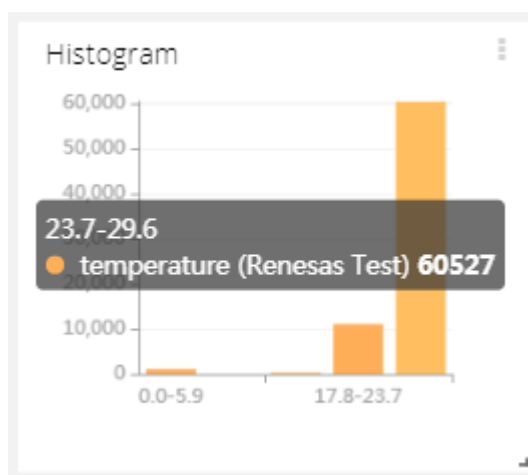
Name	Histogram	
Number of bins	5	
Y-axis range	Min: Auto	Max: Auto
Y-axis label	None	
X-Axis label	None	

Name	Enter the title of the widget to appear at its top left when displayed on the dashboard.
Number of Bins	Enter the number of columns to display. The extent of all the data values will be divided into this many 'bins'.
Y-axis range	Enter the required values for the Min and the Max or leave blank to auto scale..
Left Y-axis Label	Enter the label to appear against the left Y axis.
Y-axis Label	Enter the label to appear against the Y axis.
X-axis Label	Enter the label to appear against the X axis.
	Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the chart displays a panel showing the device name, variable name, value range and number of values in each bin.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

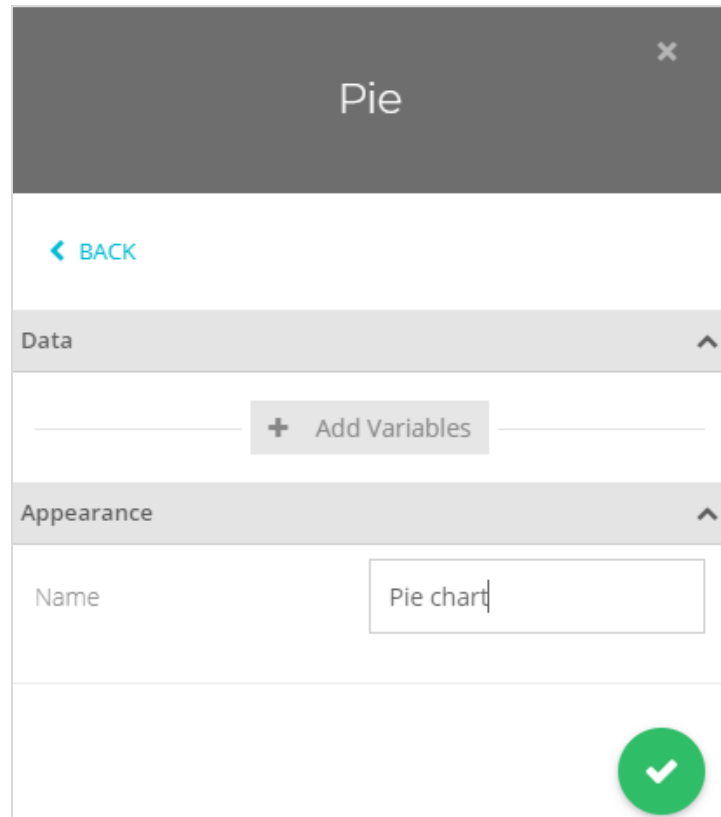
Pie

The Pie Widget displays a graphical pie chart with the size (angle) of each variable/slice representing its value in relation to the value of all the other slices.

Add a Pie Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

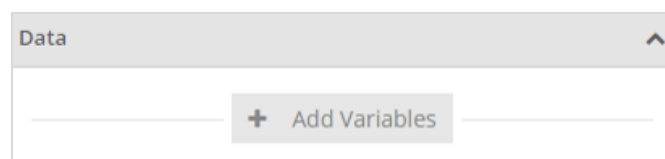


Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

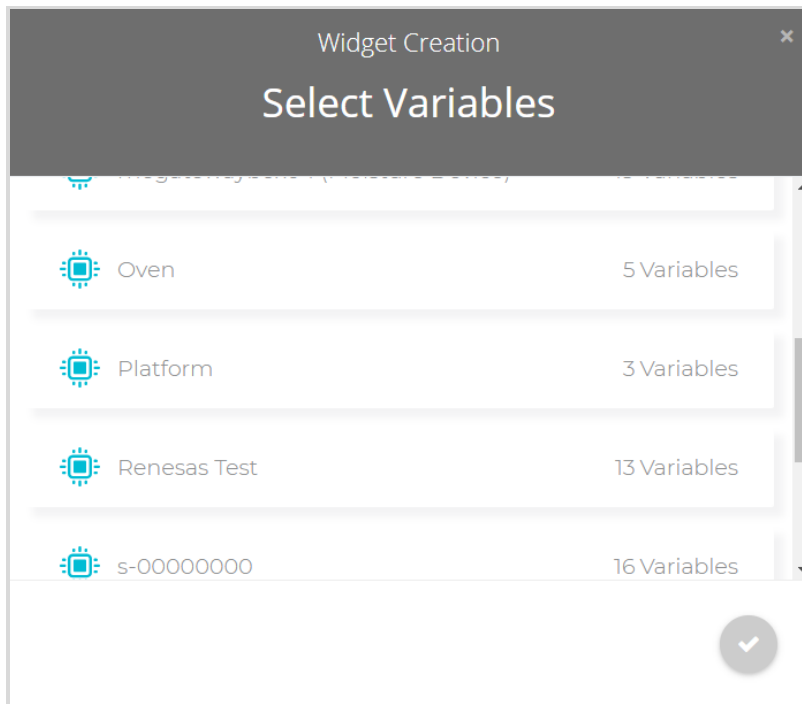
Static Dashboard

When placed on a static dashboard

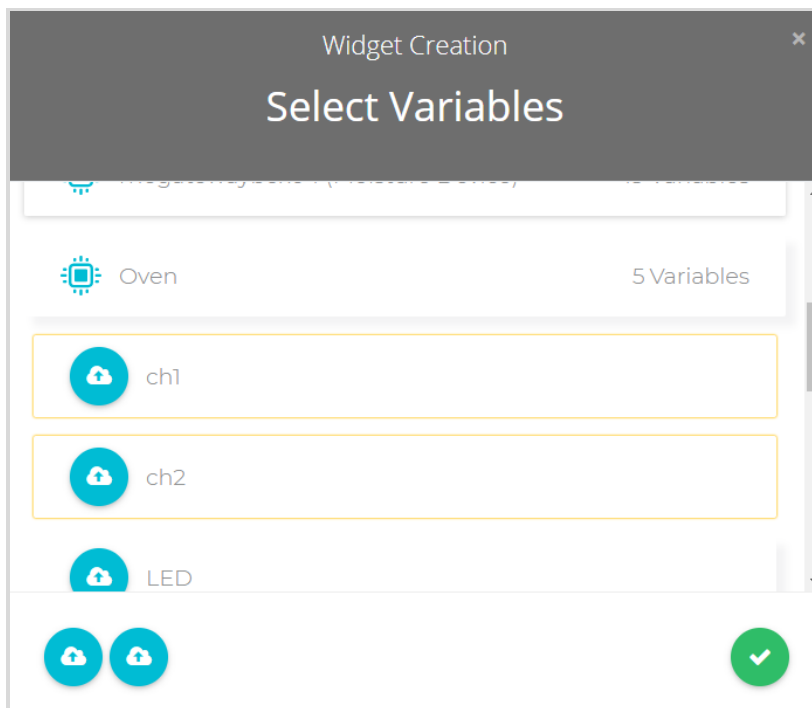



Click Add Variables to add variables (slices) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices.


Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables to select.



Click the  to close the pop-up to return to the property panel.

You can now see the variables you selected added to the list. If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#)

Dynamic Dashboard

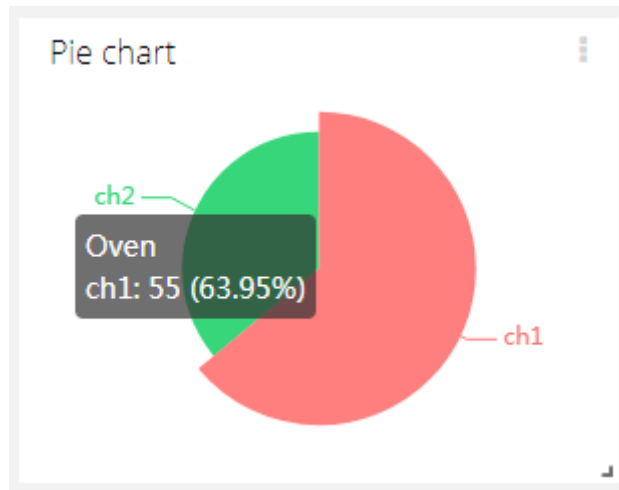
When placed on a dynamic dashboard this option will be visible.

Widget Behaviour allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section.

However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

Simply click where it says Type a Label and enter the label name.

+ Add Variables



Hovering the mouse pointer over a pie section displays a panel showing the device name, variable name, value and percentage.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Rose Chart

Use the Rose Chart to display polar-parameterised data in the form of histograms. While Rose charts may serve different purposes, their are commonly used to plot wind direction and speed simultaneously. This type of chart is also known as a Wind Rose graph. In such a case, the Rose Chart parameters would be:

- Polar (magniture, angle) variable: Wind direction
- Magnitude variable: Wind speed

For each cardinal direction, the chart displays a speed histogram over a given time period which is the range selected for the dashboard.

Add a Rose Chart Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

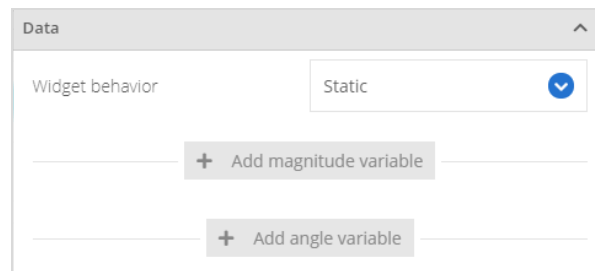
The screenshot shows a 'Rose chart' property panel. At the top is a dark grey header with the title 'Rose chart' and a close button (X). Below the header is a white area with a blue '< BACK' button. The panel is divided into two main sections: 'Data' and 'Appearance', each with a grey header and an expand/collapse arrow. The 'Data' section contains a 'Widget behavior' dropdown set to 'Dynamic', and two buttons: '+ Add magnitude variable' and '+ Add angle variable'. The 'Appearance' section contains several settings: 'Name' (text input 'Rose chart'), 'Font family' (dropdown 'Open Sans'), 'Number of bins' (text input 'Auto'), 'Polar axes' (dropdown '8'), 'Magnitude range' (two text inputs '0' and '100'), and 'Decimal points' (text input 'Auto'). A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

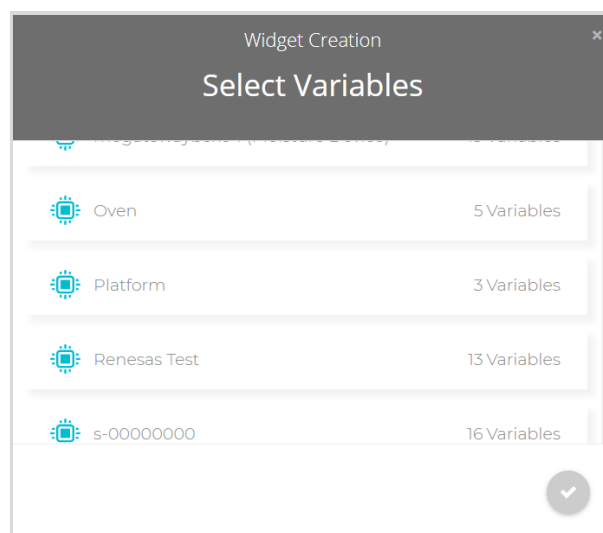
Static Dashboard

When placed on a static dashboard

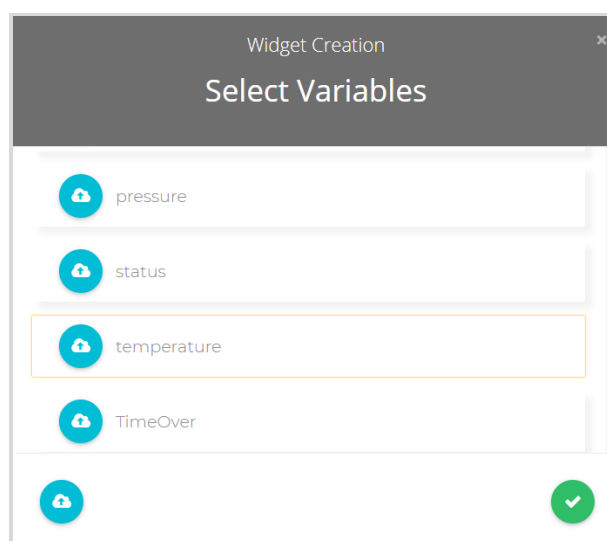



Click Add Magnitude Variable and Add Angle Variable to add variables to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select a single variable from any single device.

Click on a device to expand the list to show the variables contained in that device.




As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up.



Click the  to close the pop-up to return to the property panel.

You can now see the variables you selected added to the Data section.

If you hover over the variable you will see a delete icon  appear so it can be removed from the panel. To change the colour of the plot for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#)

You can also see additional options for the Magnitude variable.

Unit

You can enter your own Unit text to appear next to each bin on the legend or use the units defined by the Magnitude variable.

Span

Select 'Set by dashboard' to use the time span selected for the dashboard or select a custom time and date range from the pop up dialog box.

The widget will use data from the specified variables over this time span to generate the plots on each axis.

Get Angle from Variable's Context

In some (unusual) cases a magnitude variable **may** contain its angle or direction value inside its own context rather than that information being contained in a separate variable. If this is the case then check this option to be able to define the context key for the context containing the Direction data.

If this is selected then an Angle variable is not selected.

When placed on a dynamic dashboard this option will be visible.


The screenshot shows a configuration panel titled 'Data'. It has a 'Widget behavior' dropdown menu currently set to 'Dynamic'. Below this is a button labeled '+ Add Variables'.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Magnitude Variable or Add Angle Variable a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

The screenshot shows the 'Data' widget configuration panel with more options. 'Widget behavior' is still 'Dynamic'. Below it is a 'Label' field with a placeholder 'Type a label'. Further down are 'Unit' (set to 'rets'), 'Span' (set to 'Set by dashboard'), and a toggle for 'Get angle from variable's context' which is currently off. At the bottom is a button labeled '+ Add angle variable'.

Simply click where it says Type a Label and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. To change the colour of the plot for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

You can also see additional options against the Magnitude variable.

See the [Static Dashboard](#) section for the description of the other settings.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance

Name

Rose chart

Font family

Open Sans

Number of bins

4

Polar axes

16

Magnitude range

0

10

Decimal points

Auto

- Name

Enter the title of the widget to appear at its top left when displayed on the dashboard.
- Font family

Select one of the available fonts.
- Number of Bins

Select how many bins, or discrete sets of ranges, the Magnitude Range is divided into.
- Polar Axes

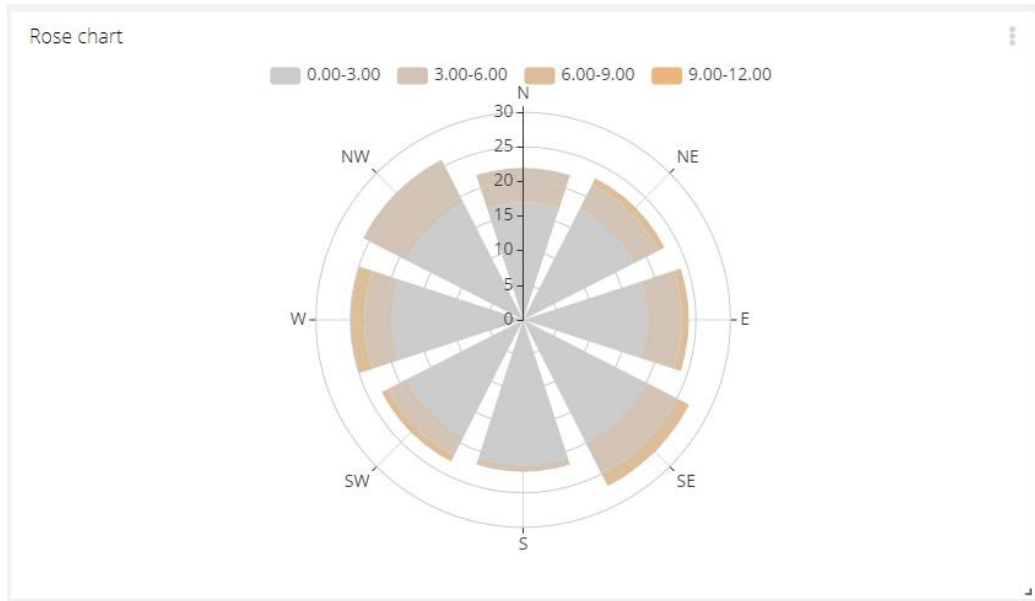
Select the number of polar axes to display. Selecting 4 will display N, S, E & W.
Selecting 8 will display N, NE, E, SE, S, SW, W, & NW
Selecting 16 will display N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW & NNW
- Magnitude Range

Select the range that the Magnitude value will cover. This range will be divided into the specified Number of Bins and the colour of the bar will be dependent on how many of the Magnitude variable value points are in that band. The more values the brighter the colour.
- Decimal Points

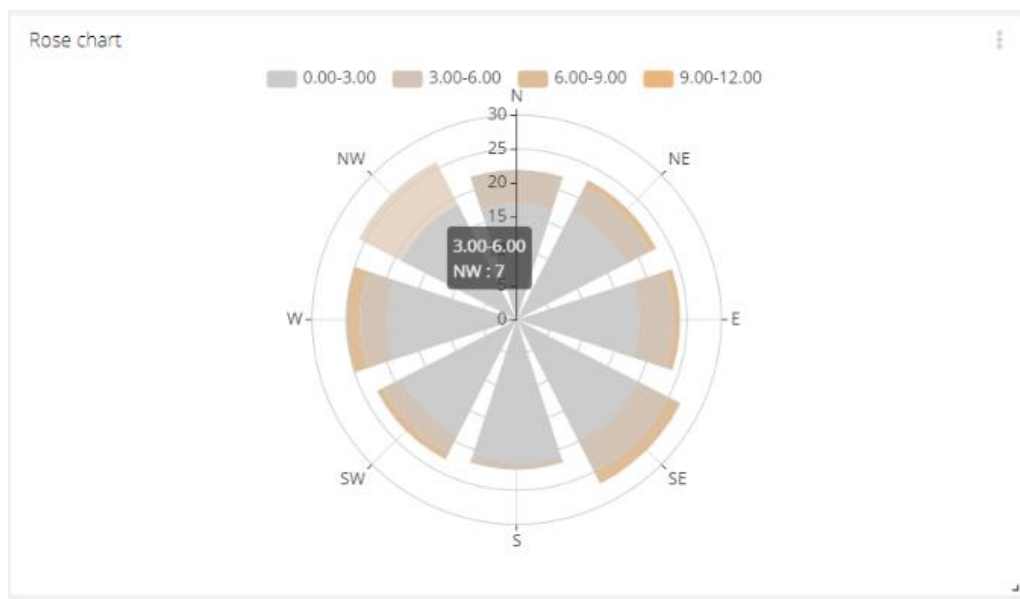
Enter the number of decimal places to show for variable values in the information bar when the mouse is hovered over the chart.

Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the chart displays a panel showing the Directional axes, the range of magnitude values in the highlighted bin and the number of magnitude values in the bin.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Metric

The Metric Widget is a data visualization option that enable built-in computation functions such as maximum, minimum, sum, count, average, or last value to be calculated and displayed for specified time-period.

SensorSpace's Metric Widget, in addition to its analytical benefits also supports a degree of customization using an HTML editor to adjust display formatting.

Add a Metric Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

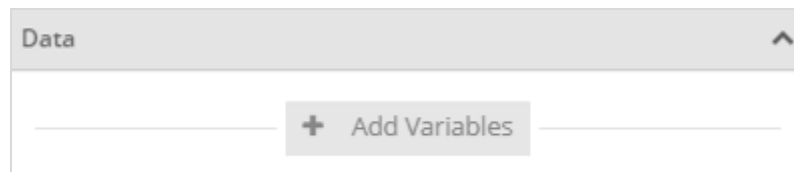
The screenshot displays the 'Metric' widget's configuration interface. At the top, a dark grey header bar contains the title 'Metric' and a close button (X). Below the header is a white bar with a blue '< BACK' button. The main content area is divided into two sections: 'Data' and 'Appearance', each with a grey header bar and an expand/collapse arrow. The 'Data' section contains a button labeled '+ Add Variables'. The 'Appearance' section contains several settings: 'Name' (a text box with 'Metric' and a blue icon), 'Use the HTML editor' (a toggle switch), 'Show last updated info' (a toggle switch), 'Font family' (a dropdown menu with 'Open Sans'), 'Decimal points' (a text box with 'Auto'), 'Date format' (a dropdown menu with 'May 30 2019 11:20'), and 'Color' (a dropdown menu with 'Variable's default'). A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

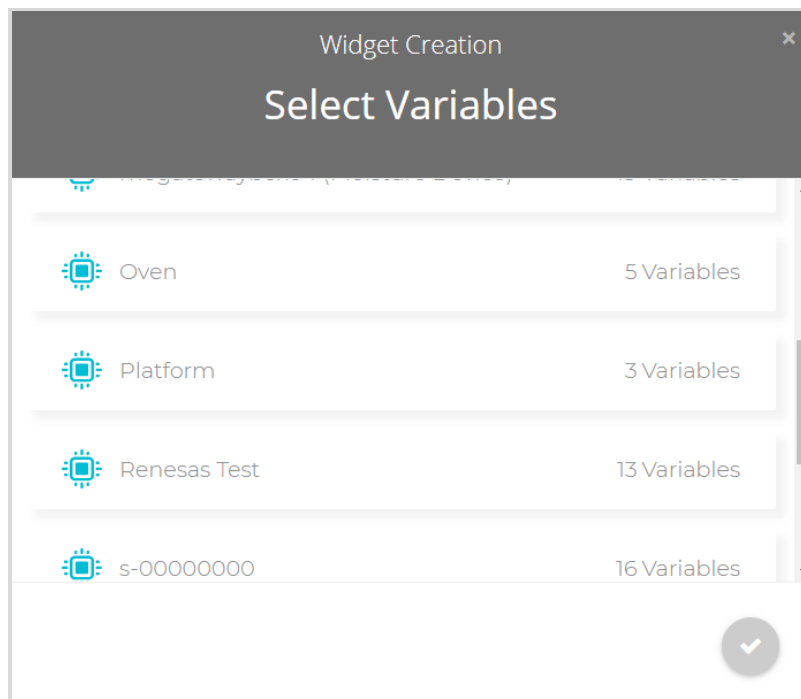
Static Dashboard

When placed on a static dashboard

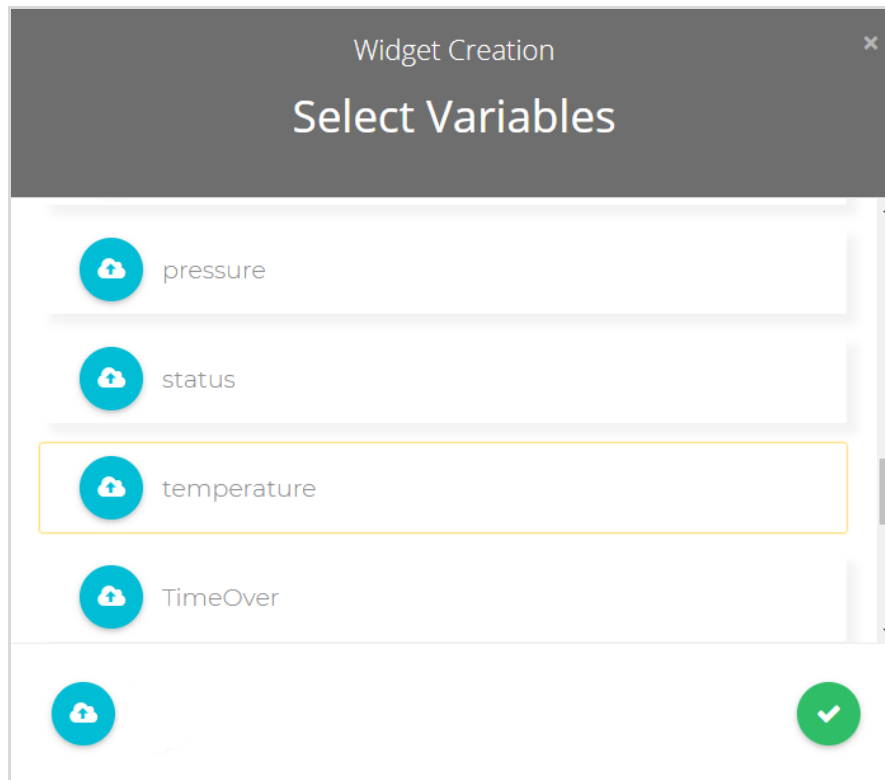



Click Add Variables to add variables (slices) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices.

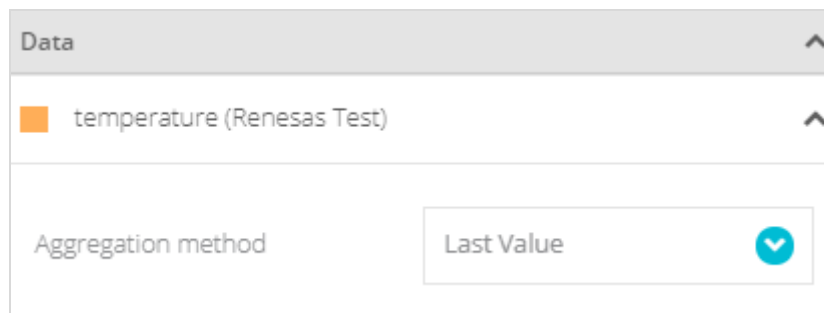
Click on a device to expand the list to show the variables contained in that device.




As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables to select.



Click the  to close the pop-up to return to the property panel.



You can now see the variable you selected added to the list. If you hover over the variable you will see a delete icon  appear so it can be removed from the list.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

You can also see additional options against **each** variable.

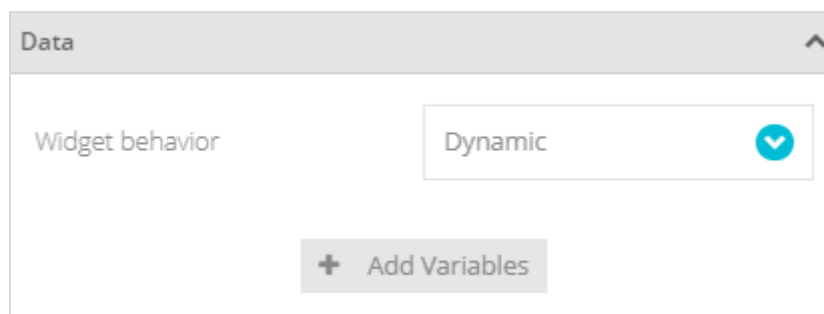
Aggregation Method – Select how the data points from the variable will be displayed. You can choose from Average, Count, Maximum, Minimum, Raw and Sum. As you select different aggregate options there may be a secondary time selection named Span. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display the value as the average of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Count</i>	Span	Display the value as the number of data values received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Last Value</i>		Display the last data value received for the specified variable.
<i>Maximum</i>	Span	Display the value as the maximum value of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Minimum</i>	Span	Display the value as the minimum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Sum</i>	Span	Display the value as the sum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.

When the span is set to Set By Dashboard the span can be changed by selecting it in the dashboard's settings bar.

Dynamic Dashboard

When placed on a dynamic dashboard this option will be visible.



Widget Behaviour allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section.

However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

The 'Data' panel contains the following settings:

- Widget behavior:** Dynamic
- Label:** Type a label
- Aggregation method:** Last Value

Simply click where it says Type a Label and enter the label name.

Click Add Variables to create another item in the list. As for static variables, click the item's coloured square to display the colour selection pop-up.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

You can choose whether to let the widget display the data simply or you can choose to edit the HTML code directly for a more customised look.

The 'Appearance' panel contains the following settings:

- Name:** Metric
- Use the HTML editor:** ☐
- Show last updated info:** ☒
- Font family:** Open Sans
- Decimal points:** Auto
- Date format:** May 30 2019 11:20
- Color:** Variable's default

Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Use The HTML Editor Leave off for a simple display or turn on for custom control over HTML content. When active this will present a button at the bottom of the Appearance section named Open Editor. Click to open the HTML Editor.

Metric Widget
×

Add Custom HTML

```

1 <p style="margin: 0;">{{aggregationMethod}} {{span}}</p>
2 <p style="font-size: 4rem; font-weight: bolder; line-height: normal; margin: 0;">
3   {{value}}
4 </p>
5 <p style="margin: 0;">{{timestamp}}</p>

```

Cancel

Accept

You can enter your own HTML code here to make the widget look like you want. Certain tokens can be inserted into the code which will be replaced with the real-time variable data when the widget is displayed.

Token	Meaning
{{aggregationMethod}}	Retrieves the method used to get the value.
{{value}}	Current value according to the aggregation method and time span selected.
{{variable}}	This key allows retrieving both name and unit properties from the variable. To access use the dot "." operator as follows: {{variable.name}} {{variable.unit}}
{{device.name}}	Retrieves variable's associated Device Name.
{{span}}	Time range selected to obtain data according to the Aggregation Method.
{{timestamp}}	Timestamp of the displayed data in a format matching the one selected on the Metric Widget Settings.
{{context.key}}	Retrieves the value from the variable context key specified.

Show Last Updated Info	Only available when the HTML Editor has not been chosen. This will add a time and date under the metric value showing when the value was received.
Font family	Select one of the available fonts.
Decimal Points	Enter the number of decimal places to show in the metric value.
Date Format	Only visible when Show last Updated Info is selected. Select a suitable date format from the list.
Colour	Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.
Colour Logic	Only visible when Colour Logic is selected for the Colour option above. Click Add Colour Logic to add to the default set of colours.

The screenshot shows a modal window titled "Select color logic" for a "Metric widget". It contains a table with two rows for defining color ranges. The first row has a range from 0 to 1 with a grey color (#C4C4C4). The second row has a range from 1 to 1 with a green color (#4BA651). Each row has a delete icon to its right. Below the table is an "Add Range" button. At the bottom of the modal are "Cancel" and "Accept" buttons.

Range	Color	Delete
0	#C4C4C4	
1	#4BA651	

Buttons: Add Range, Cancel, Accept

Add new ranges by clicking the Add Range button.
Delete ranges by clicking the delete icon to the right of a range.
Select a colour by clicking the colour swatch or the colour code field.
The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.



Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions

The widget has no specific actions or functionality when displayed on the dashboard.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Map

The map widget can display the position or historic movements of multiple devices. The positional data is held in context data for certain variables delivered by a device. You can manually set the location of all devices even if they do not deliver their own geo location data.

Add a Map Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

Map

[< BACK](#)

Data

Display location history ☐

[+ Add Device](#)

Appearance

Name	Map
Layer type	Roadmap
Style	Light
Zoom	12
Marker	Pin
Marker color	Device color
On hover action	Do nothing
On click action	Display all variables

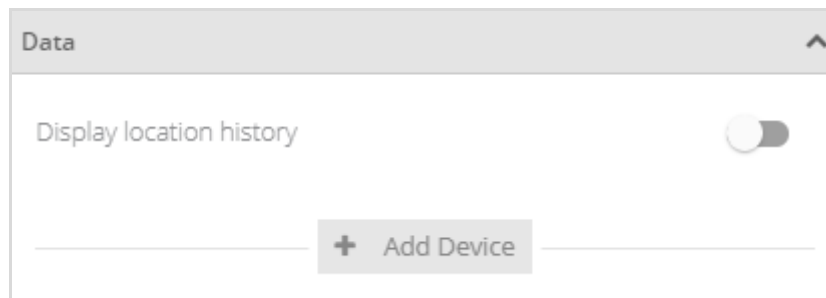
[✓](#)

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

Static Dashboard

When placed on a static dashboard



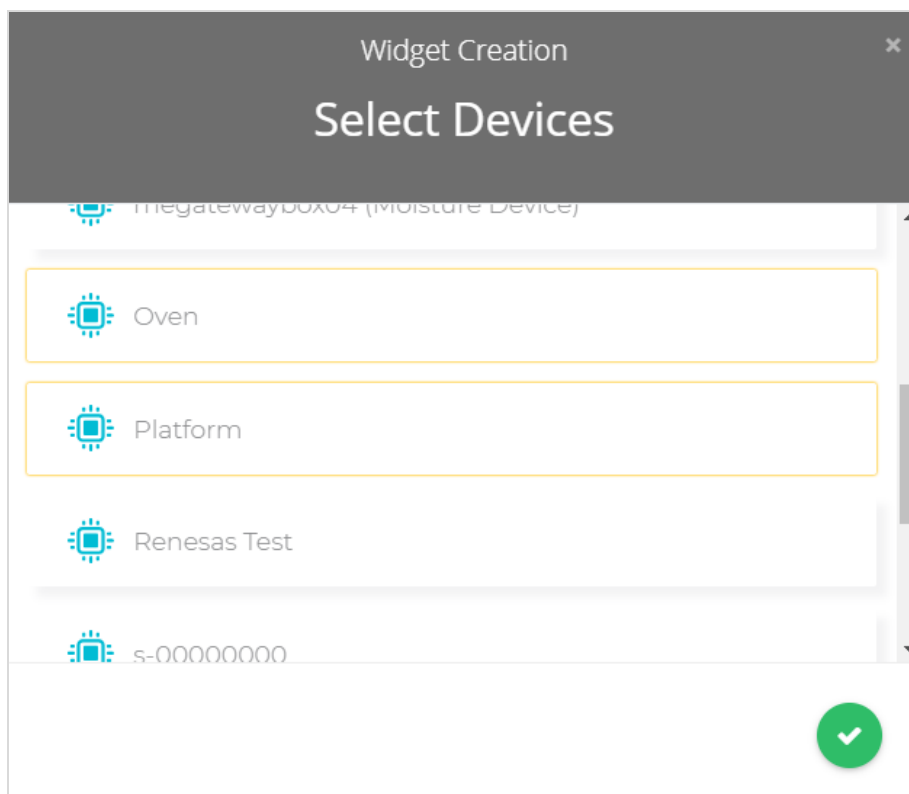
Enable Display Location History to show a trace of where the selected devices have been over the timespan selected on the dashboard settings bar. When unselected each device will be represented by a single location pin showing the last reported location.


A second option of Show Heatmap will be available if you select Display Location History and instead of showing the trace of where a device has travelled it will show a heatmap of the locations the device has been so it can be seen where they spent most time.

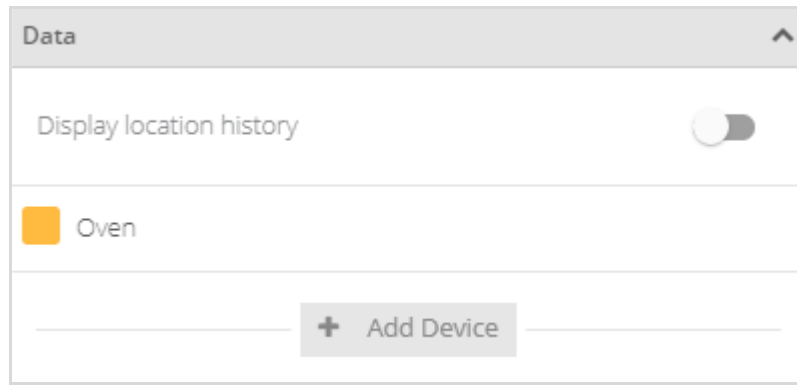
Note that not all devices may deliver dynamic position data. Some devices have a fixed location defined within this platform.

Click Add Device to add devices to the widget. Because this is a static widget you will be selecting specific devices. A pop-up will be displayed allowing you to select devices from a list.


You can select multiple devices or click Add Device again at a later time.



Click the  to close the pop-up to return to the property panel.



You can now see the variable you selected added.

If you hover over the device you will see a delete icon  appear so it can be removed from the list.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

When placed on a dynamic dashboard this option will be visible.

The 'Data' panel contains two settings:

- Widget behavior:** A dropdown menu currently showing 'Dynamic'.
- Display location history:** A toggle switch that is currently turned off.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then there is nothing more to select. The location data from the currently selected device from the dashboard's settings bar will be used to display the map.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

The 'Appearance' panel contains the following settings:

- Name:** Map
- Layer type:** Roadmap
- Style:** Light
- Zoom:** 12
- Marker:** Device icon
- Marker color:** Device color
- On hover action:** Display selected variables
- On click action:** Display selected variables
- On click display variables:** 2 selected

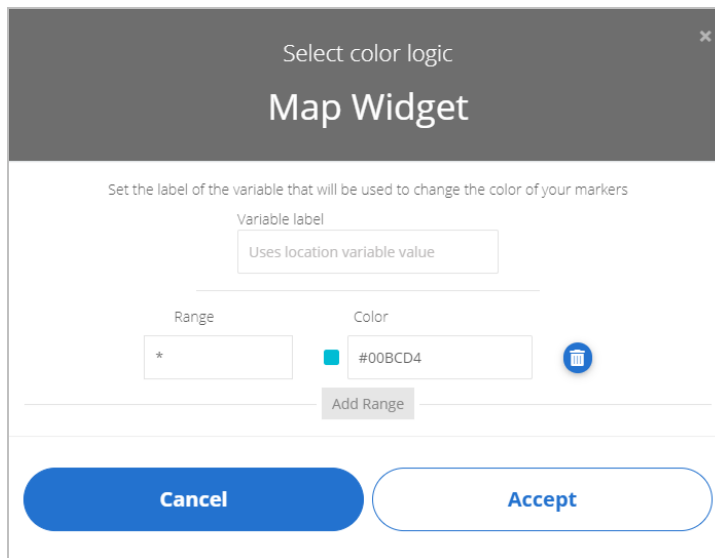
Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Layer Type Select how to represent the map. Choose from Roadmap, Satellite or Hybrid.

Style Select a Style to theme the map between Light, Dark or Custom.


Custom option is only available when Roadmap layer is selected.
Selecting custom makes the Custom Style item visible.

- Custom Style** Click Open Editor to create custom map styles. The easiest way to do this is to click on the snazzy Maps link and copy any desired style from their web site. Then paste the code into the editor box and click Accept.
- Zoom** Choose a default Zoom value for the map.
- Marker** Select a Marker pin: 'Pin' is a simple pin whereas 'Location Variable Icon' replace the normal pin with the variable icon and 'Device Icon' uses the icon assigned to the device.
- Marker Colour** Choose Device Colour to display the marker in the colour selected for the device.
If Marker color option is 'Based on Value', then the Colour Logic section will be visible below.
- Colour Logic** Only visible when 'Based On Value' is selected for the Marker Colour.



Type in the name of the variable to represent the value used to determine the colour displayed.

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed.

- On Hover Action** Choose to display a pop-up when the mouse hovers over a device pin.
Do Nothing – Do nothing when hovered.
Display Address – Display the address of the location of the pin.
Display All Variables – Display all variables and their values in the device.
Display Selected Variables – Display just a list of user selected variables contained in the device. The variable list will be those defined in the On Click Display Variables section below.
- On Click Action** Choose to display a pop-up or execute action when the device pin is clicked.
Do Nothing – Do nothing when clicked.
Display Address – Display the address of the location of the pin.
Display All Variables – Display all variables and their values contained in the device.
Display Selected Variables – Display just a list of user selected variables in the device. The variable list will be those defined in the **On Click Display Variables** section below.
Set Dashboard Device – For a dynamic dashboard select this device to show the information for.

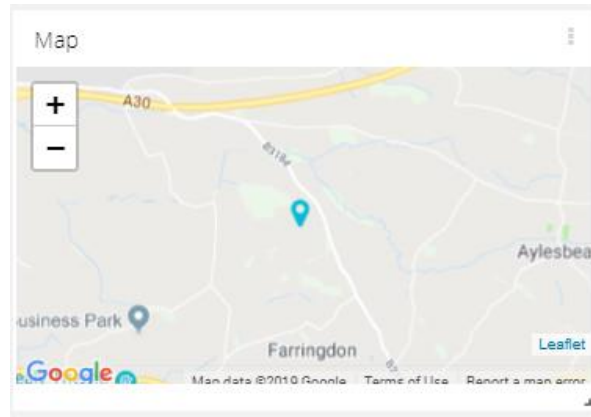
On Click Display Variables

Click to add variables to the list of selected variables. You need to type in the variable label when adding one. Individual variables in the list can be toggled on and off by clicking their ticks. These variables will be shown on click and hover actions if **Display Selected Variables** is selected.



Click to close the properties panel and place the widget onto the dashboard.

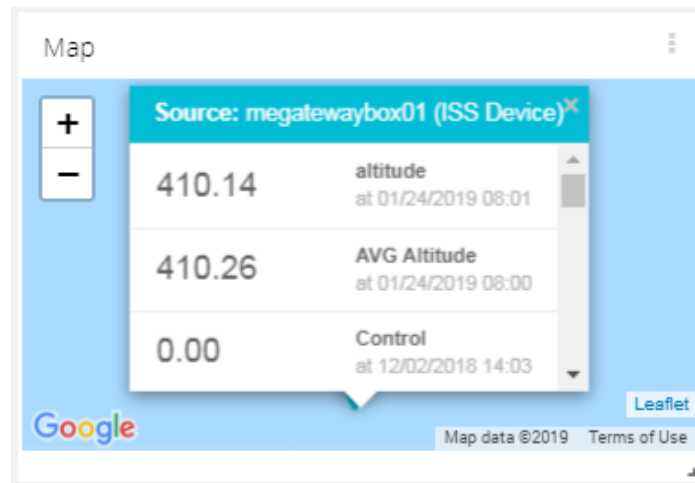
Dashboard Appearance



Expectations for Visualization

It is important to note that the SensorSpace real-time map display is a live interface. When you select to "Display location history" of data in the Map, your historical data will appear as "dots." Any incoming real-time data will appear as a smooth "line". To update the real-time line to contain the historical data information and be presented as "dots", you need only to reload the historical range of data.

Dashboard Actions



The map can be zoomed and panned with the mouse wheel or gestures and the \pm buttons can also be used to zoom in and out.

Clicking or hovering over a device pointer may display a list of variables if configured to do so or may redirect a dynamic dashboard to display variable data from the clicked device.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Indicator

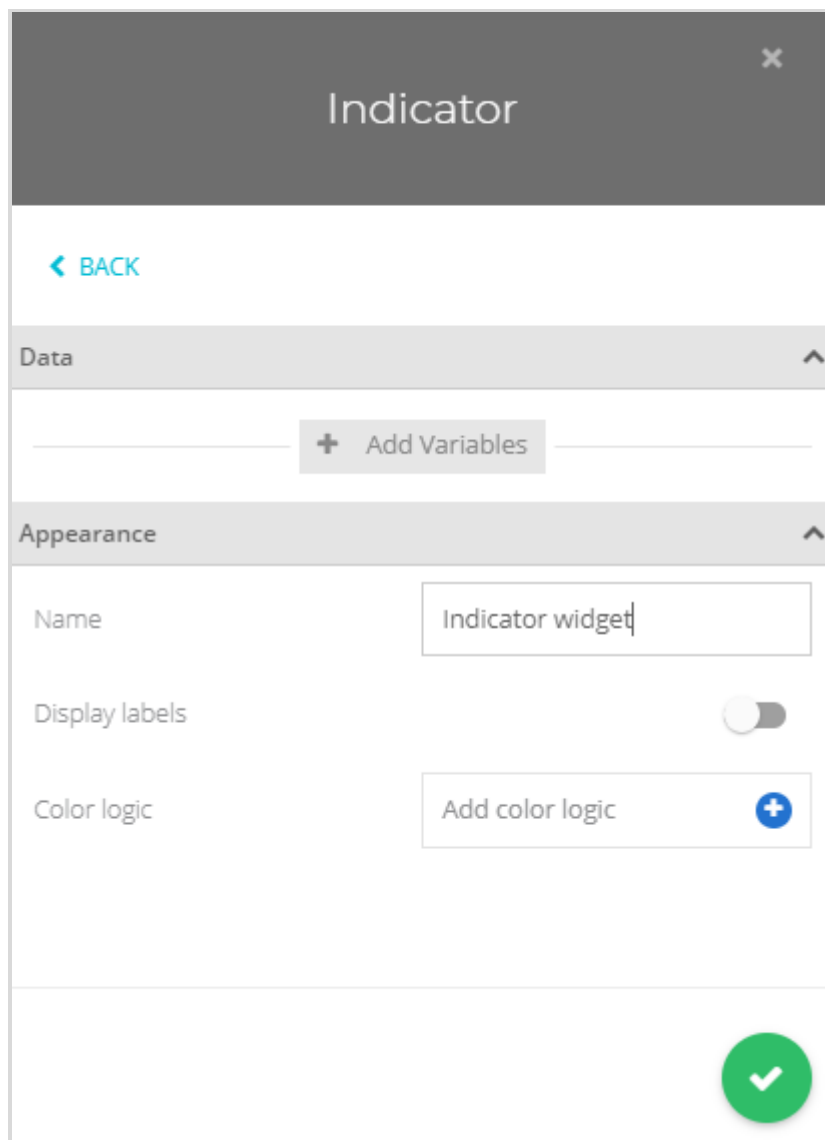
This indicator widget shows the state of the variable by displaying a coloured disc. Different value ranges can be assigned along with a text description. This can simply show binary data in an on/off manner or more complex ranged indication such as dryness of soil etc.

One widget can support multiple indicators, each based on a different variable.

Add a Indicator Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.



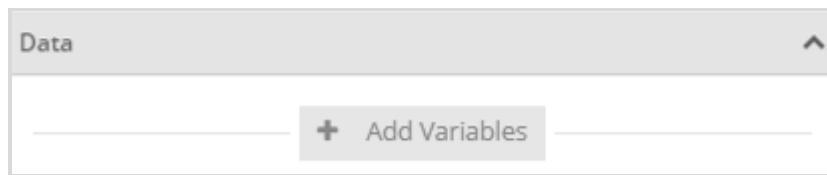
The screenshot shows the 'Indicator' property panel. At the top is a dark grey header with the title 'Indicator' and a close button (X). Below the header is a white bar with a blue left arrow and the text 'BACK'. The panel is divided into two main sections: 'Data' and 'Appearance', each with a grey header and an expand/collapse arrow. The 'Data' section contains a text input field and a grey button with a plus sign and the text 'Add Variables'. The 'Appearance' section contains three rows: 'Name' with a text input field containing 'Indicator widget'; 'Display labels' with a toggle switch currently turned off; and 'Color logic' with a text input field containing 'Add color logic' and a blue plus button. At the bottom right of the panel is a large green circular button with a white checkmark.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

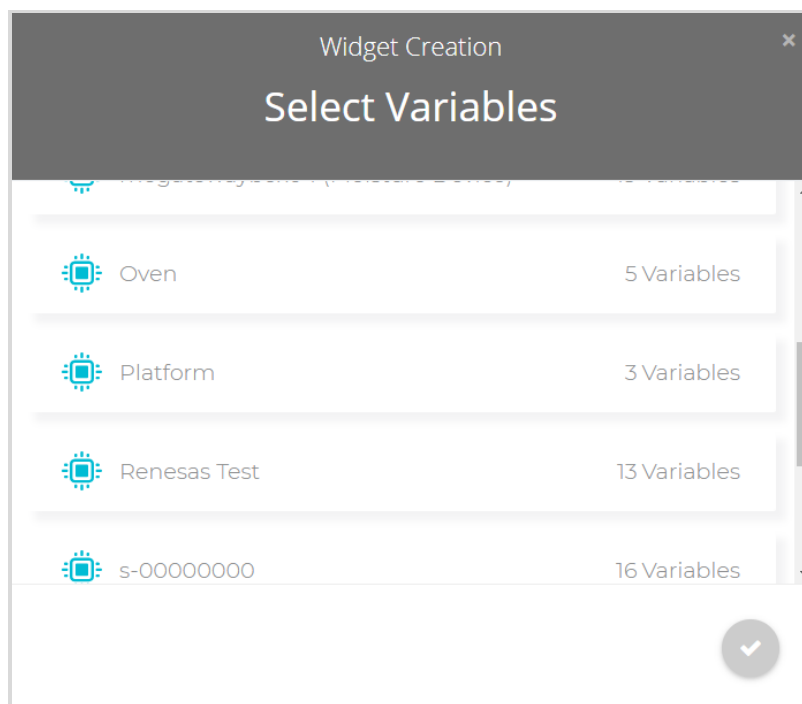
Static Dashboard

When placed on a static dashboard

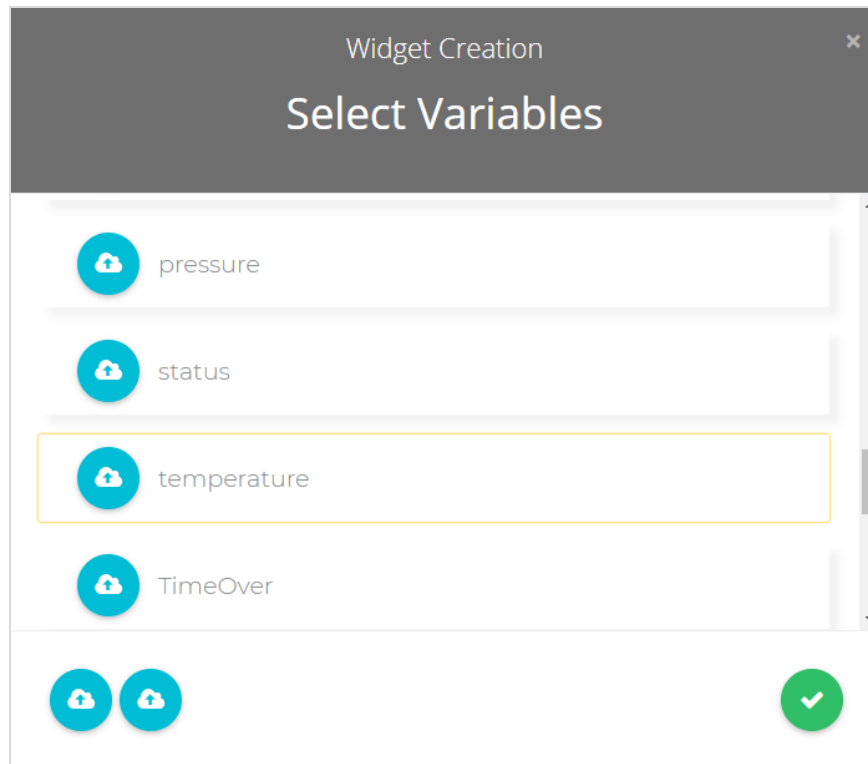



Click Add Variables to add variables (traces) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices. Adding multiple variables will result in multiple indicators all sharing the same widget.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables for selection.



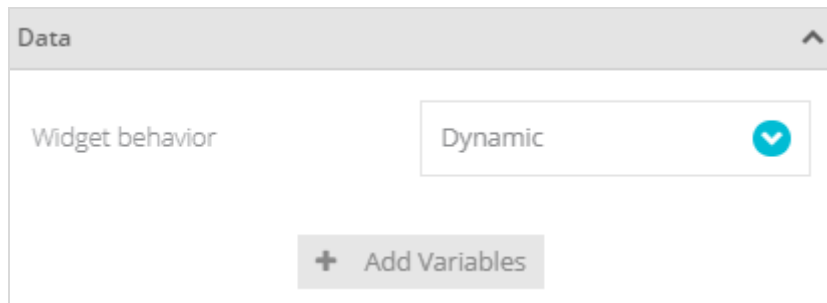
Click the  to close the pop-up to return to the property panel.



You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

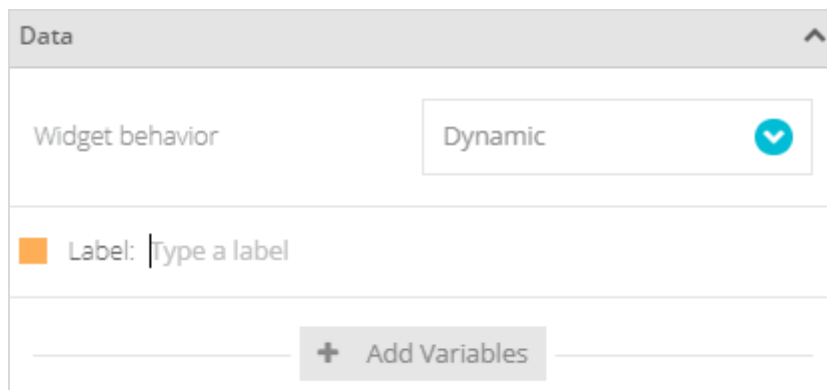
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a configuration panel titled 'Data' with a collapse arrow in the top right. Inside, the 'Widget behavior' is set to 'Dynamic' in a dropdown menu with a blue checkmark icon. Below this is a grey button with a plus icon and the text 'Add Variables'.


Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



This screenshot shows the same configuration panel as above, but with an additional input field. Below the 'Dynamic' dropdown, there is a row with an orange square icon, the text 'Label:', and a text input field containing the placeholder 'Type a label'. At the bottom, the 'Add Variables' button is still present.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

The screenshot shows the 'Appearance' configuration panel for an 'Indicator widget'. The panel has a title bar with an upward arrow. Below the title bar, there are several settings: 'Name' is set to 'Indicator widget' with a pencil icon; 'Display labels' is a toggle switch turned on; 'Data format' is set to 'Auto' with a dropdown arrow; 'Decimal points' is set to 'Auto' with a text input field; 'Date format' is set to 'Set by Dashboard' with a dropdown arrow; 'Show seconds' is a toggle switch turned off; and 'Color logic' is set to 'Add color logic' with a plus icon. At the bottom right of the panel is a large green circular button with a white checkmark.

Name	Enter the title of the widget to appear at its top left when displayed on the dashboard.
Display Labels	Select whether to display the variable value and date and time last value was received below the indicator.
Data Format	Select the date format to use if Display Labels is enabled.
Decimal Points	Enter the number of decimal places to show for variable values if Display Labels is enabled.
Date Format	Select the required data format to be displayed on the widget if Display Labels is enabled.
Show Seconds	Choose whether to show or hide seconds where time is displayed on the widget if Display Labels is enabled.
Colour Logic	Click Add Colour Logic to add to the default set of value ranges and colours.

Select color logic

Indicator widget

Range	Text to show	Color
0	Off	#C4C4C4
1	On	#4BA651

Add Range

Cancel Accept

Add new ranges by clicking the **Add Range** button.

Delete ranges by clicking the delete icon to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The **Range** value states from which value the particular colour will be displayed. The default settings will result in a grey indicator when the variable value is less than 1 but a green indicator when the variable value is 1 or greater.

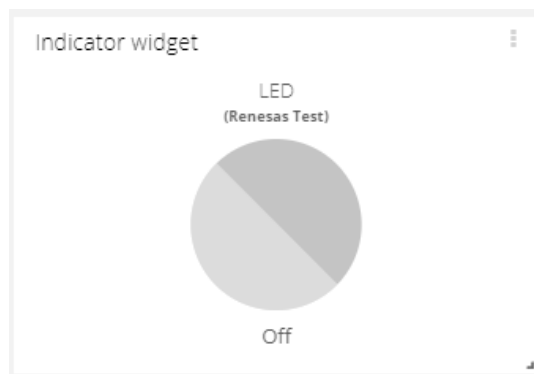
Enter the **Text To Show** when the particular range is displayed. In the default example this is set to Off and On but this could just as easily represent soil moisture levels, for example, and read Too Dry, Dry, OK, Wet, Too Wet.



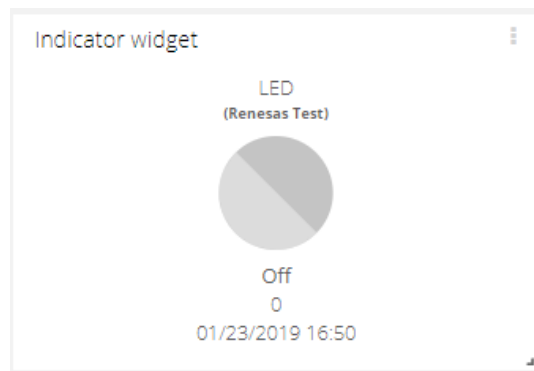
Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance

Without Display Labels enabled.



With Display Labels Enabled



Dashboard Actions

The widget has no specific actions or functionality when displayed on the dashboard.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Gauge

This indicator widget shows the state of the variable by displaying a 180 degree gauge. Different colour ranges can be assigned.

Add a Gauge Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

Gauge

← BACK

Data

+ Add Variables

Appearance

Name: Gauge widget

Font family: Open Sans

Decimal points: Auto

Date format: May 30 2019 13:00

Range value: 0 to 100

Pointer: ☐

Color: Set by widget

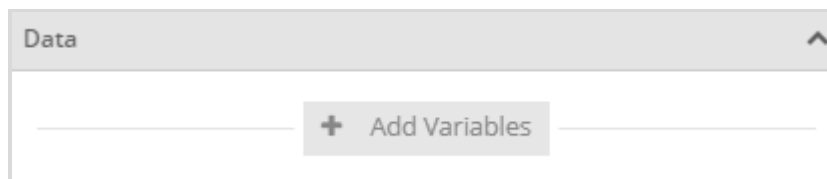
✓

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

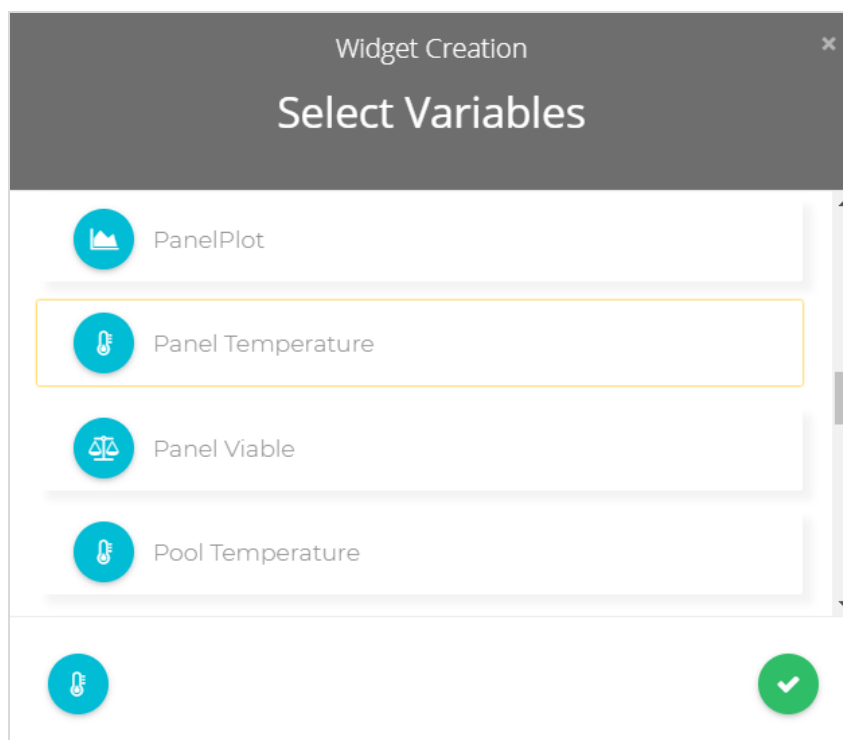
Static Dashboard

When placed on a static dashboard




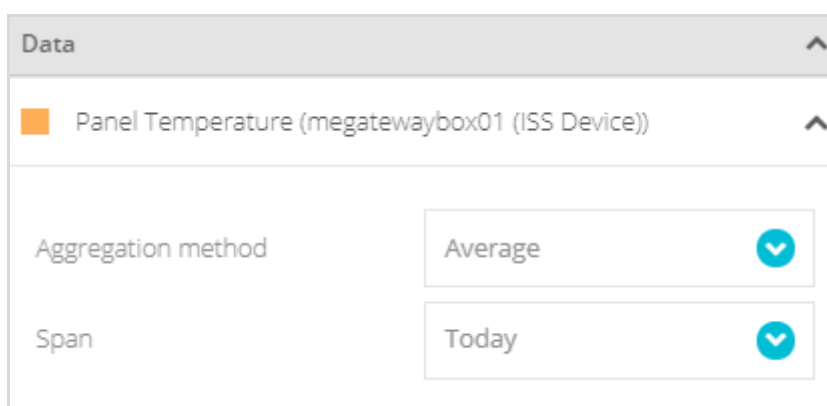
Click Add Variables to add a variable to the widget. Because this is a static widget you will be selecting a specific variable from a specific device. A pop-up will be displayed allowing you to select a single variable from any devices.


Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select one variable for this widget.

Click the  to close the pop-up to return to the property panel.



You can now see the variable you selected added to the list. If you hover over the variable you will see a delete icon  appear so it can be removed from the list.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

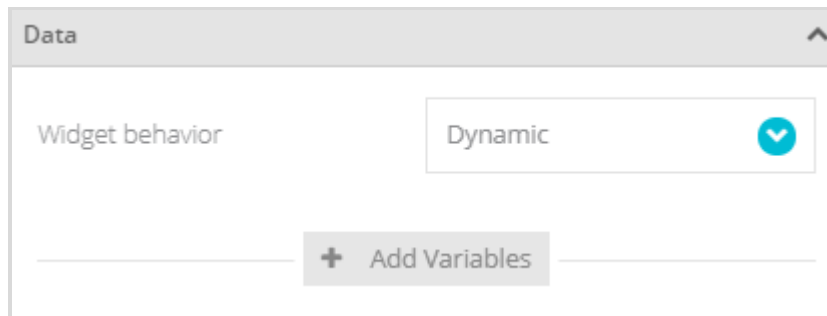
You can also see additional options against **each** variable.

Aggregation Method – Select how the displayed value will be calculated. You can choose from Average, Count, Maximum, Minimum, Raw and Sum. As you select different aggregate options there may be a secondary time selection named **Span**. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display the value as the average of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Count</i>	Span	Display the value as the number of data values received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Last Value</i>		Display the last data value received for the specified variable.
<i>Maximum</i>	Span	Display the value as the maximum value of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Minimum</i>	Span	Display the value as the minimum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Sum</i>	Span	Display the value as the sum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.

When the span is set to **Set By Dashboard** the span can be changed by selecting it in the dashboard's settings bar.

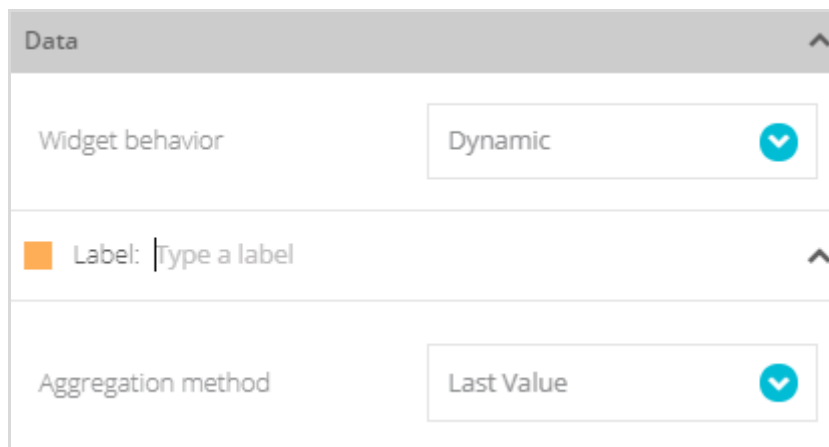
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a 'Data' settings panel. At the top, the title 'Data' is on the left and an upward arrow is on the right. Below this, the 'Widget behavior' is set to 'Dynamic' in a dropdown menu. At the bottom, there is a button labeled '+ Add Variables'.

Widget Behaviour allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section.

However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



The screenshot shows the 'Data' settings panel with the 'Widget behavior' set to 'Dynamic'. Below this, there is a section for adding variables. It has a header 'Label: |Type a label' with an orange square icon to the left and an upward arrow to the right. Below this header, the 'Aggregation method' is set to 'Last Value' in a dropdown menu.

Simply click where it says **Type a Label** and enter the label name.

The Aggregation Method settings are the same as for the Static Dashboard.

As for static variables, click the item's coloured square to display the colour selection pop-up.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

You can choose whether to let the widget display the data simply or you can choose to edit the HTML code directly for a more customised look.

Appearance

Name

Gauge widget

Font family

Open Sans

Decimal points

Auto

Date format

May 30 2019 13:00

Range value

0

100

Pointer

Color

Set by widget

Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

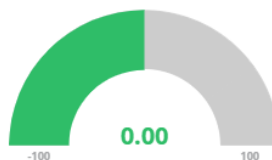
Font Family Select the desired font family to use for the values and units.

Decimal Points Leave blank for Auto or enter how many decimal places to display.

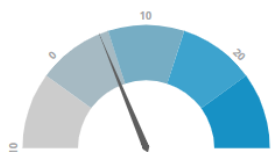
Date Format Select a suitable date format from the list to display in the floating information panel when the mouse pointer is hovered over the widget.

Range Value Enter the values at which the gauge shows the minimum and maximum.



Pointer When disabled the gauge shows a smooth unstepped display with no pointer.



When enabled the gauge is displayed with colour graded segments and a pointer.



The following options are now available.

Ticks	-10	30
Initial color		#CCCCCC
Final color		#0179AC

Ticks Enter the minimum and maximum values to show on the gauge.

Initial Colour Select the colour to show on the low part of the gauge.

Final Colour Select the colour to show on the high part of the gauge. The segments will be coloured to blend between these two colours.

Colour

Select Set By Widget to let the widget choose a colour.





Select Variable's Default to use the colour set for the variable.

Select Colour Logic to define a set of value ranges to determine the colour to display.

Click Add Colour Logic to add to the default set of colours.

Select color logic

Gauge widget


Range	Color	
0	 #C4C4C4	
1	 #4BA651	

Add Range

Cancel

Accept

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey fill when the variable value is less than 1 but green fill when the variable value is 1 or greater.

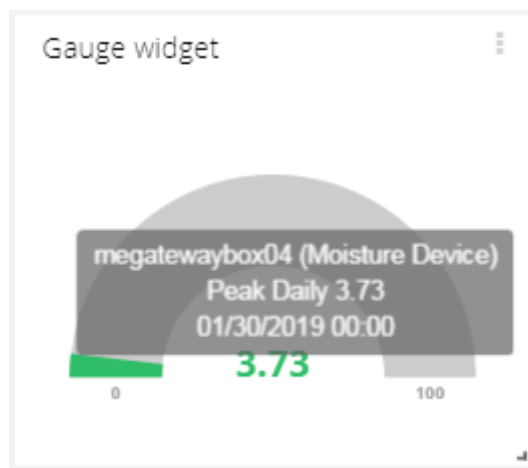


Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the widget displays a panel showing the device name, variable name and value for each variable.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)





Status Indicator

The status indicator widget shows important information delivered from the device. This can include such details as low battery or detected errors.

All devices create a variable called **status** which carries a numeric value along with textual context data which this widget displays. This status data is only sent when the status changes and not at the regular intervals the normal variables are delivered.

This widget will automatically set the status to code 100 and 'Offline' when data stops arriving from the monitored device.

The coloured disk shows green when the status is OK and various other colours as the more severe errors are reported. The reported error number is shown inside the coloured disc.

	0	OK
	1 to 30	Notes 1 Started
	31-60	Warnings 31 Low Battery in Remote Module 32 Low Signal from Remote Module 32 Low Signal from Remote Module 40 Low Battery in Device
	61-90	Errors 61 Error Reported by Remote Module 62 Lost Communications with Remote Module
	100	Offline

Status 100 is a special level of error that is set by the platform when there is no data delivered by the device for more than the heartbeat time configured (See later) and the status will be reported as Offline.

The status number, description and time of delivery are shown on the widget. If multiple warnings and errors are reported then the highest number will be indicated. The exact numeric value and text message delivered will depend on the device. See the device user manual for this information.

You can also use the **status** variable to generate events and send messages where the numeric level may determine who gets to see the event message based on the severity.

Add a Status Indicator Widget to display the property panel on the right of the screen.

Property Panel

The property panel has three sections; Data, Appearance and Colour Logic.

×

Status Indicator

< BACK

Data

^

+

 Add Device

Appearance

^

Name

Status

Max heartbeat period (Minutes)

Date format

Jan 24 2019 16:47

✓

Show seconds

Appearance

^

0	1	<div></div>	#3ED4B6	<div></div>
1	31	<div></div>	#FFBD49	<div></div>
31	61	<div></div>	#FF5722	<div></div>
61	To Infinity	<div></div>	#FF4165	<div></div>

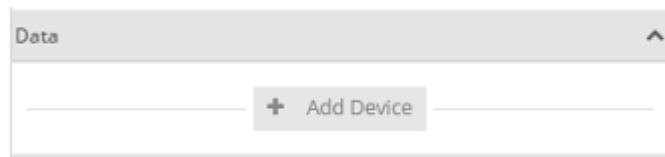
✓

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

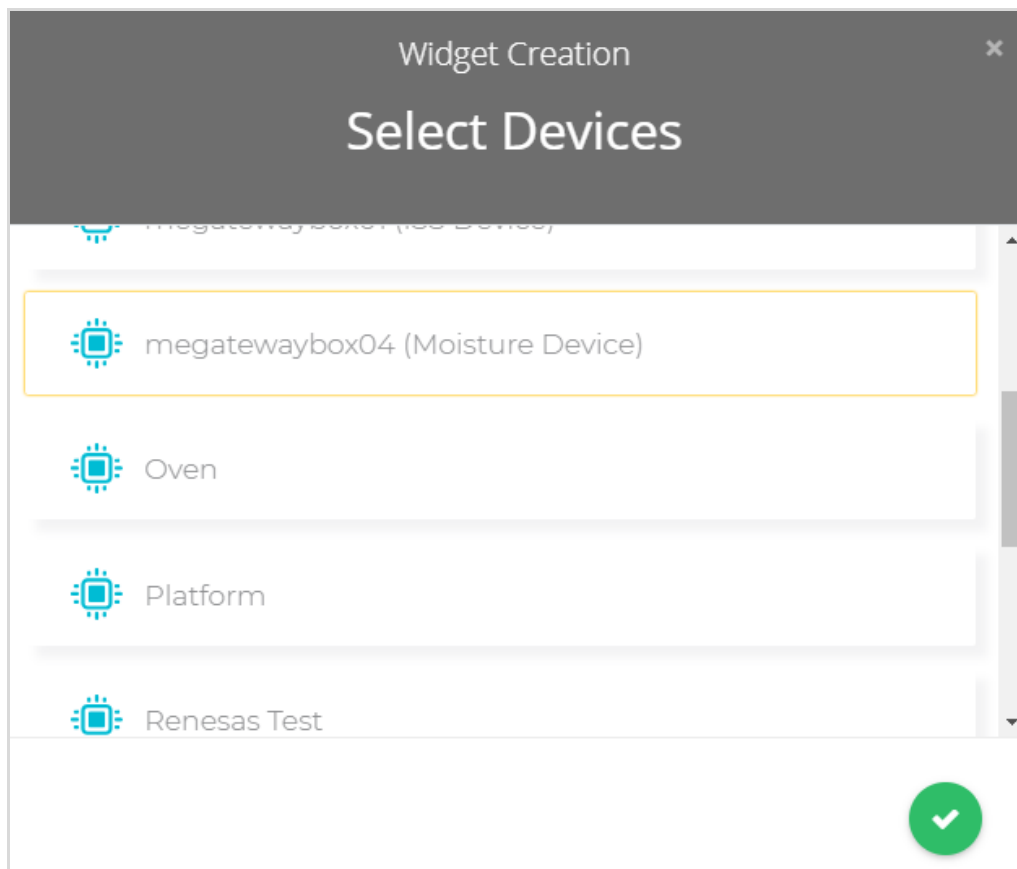
Static Dashboard

When placed on a static dashboard




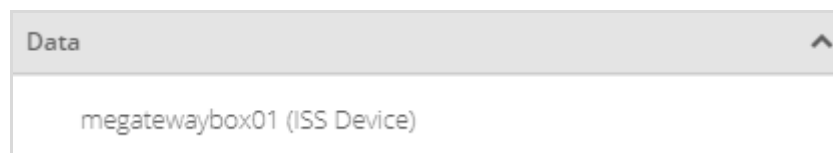
Click Add Device to add a device to the widget. Because this is a static widget you will be selecting specific device. A pop-up will be displayed allowing you to select a single device.

Click on a device to expand the list to show the variables contained in that device.




Click on a device to select it.

Click the  to close the pop-up to return to the property panel.

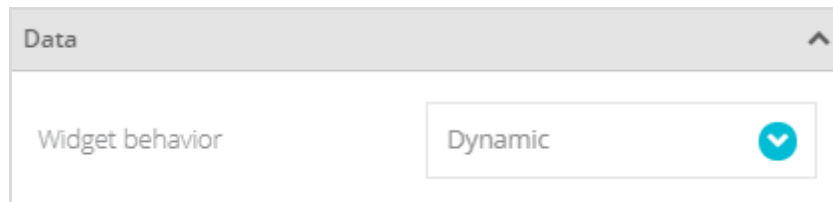


You can now see the selected device.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list.

Dynamic Dashboard

When placed on a dynamic dashboard this option will be visible.



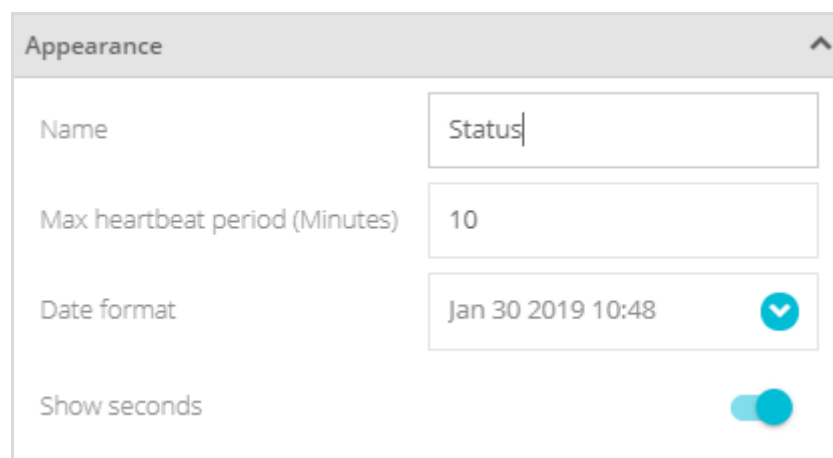
The screenshot shows a settings panel titled 'Data' with a close button (upward arrow) in the top right corner. Inside the panel, there is a label 'Widget behavior' followed by a dropdown menu. The dropdown menu is open, showing the selected option 'Dynamic' and a blue checkmark icon.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the device selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then the widget will show the status for the currently selected device in the dashboard's settings bar.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.



The screenshot shows a settings panel titled 'Appearance' with a close button (upward arrow) in the top right corner. Inside the panel, there are four settings: 'Name' with a text input field containing 'Status'; 'Max heartbeat period (Minutes)' with a text input field containing '10'; 'Date format' with a dropdown menu showing 'Jan 30 2019 10:48' and a blue checkmark icon; and 'Show seconds' with a toggle switch that is currently turned on (blue).

Name

Enter the title of the widget to appear at its top left when displayed on the dashboard.

Max Heartbeat Period

If this time (in minutes) elapses without any variable data arriving for the device then the status will be set to code 100 and status 'Offline'.

Date Format

Select the required data format to be displayed on the widget.

Show Seconds

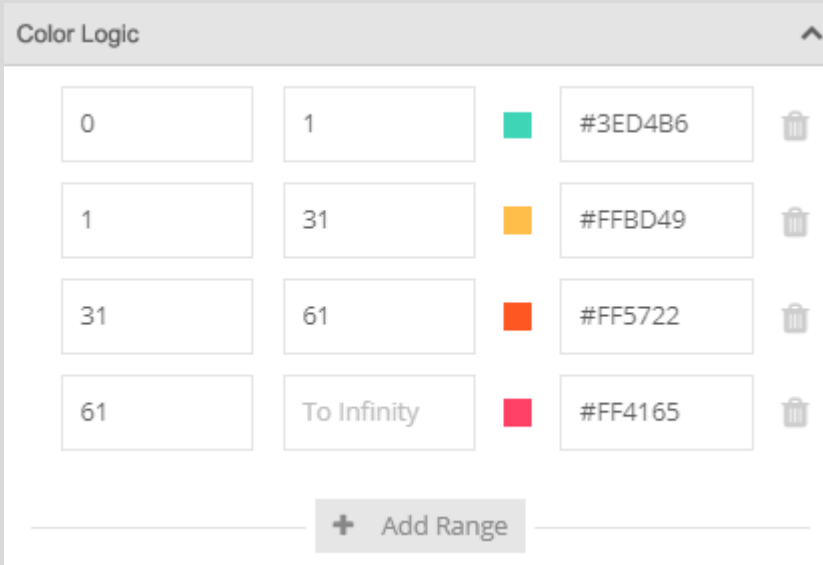
Choose whether to show or hide seconds where time is displayed on the widget.











Click to close the properties panel and place the widget onto the dashboard.

Colour Logic

Click Add Colour Logic to add to the default set of value ranges and colours.




The 'Color Logic' window displays a table of value ranges and their corresponding colors. The table has four rows and four columns: Range Start, Range End, Color Swatch, and Color Code. Each row also includes a delete icon (trash can) to the right of the color code.

Range Start	Range End	Color Swatch	Color Code	Delete
0	1		#3ED4B6	
1	31		#FFBD49	
31	61		#FF5722	
61	To Infinity		#FF4165	

At the bottom of the window is a button labeled '+ Add Range'.

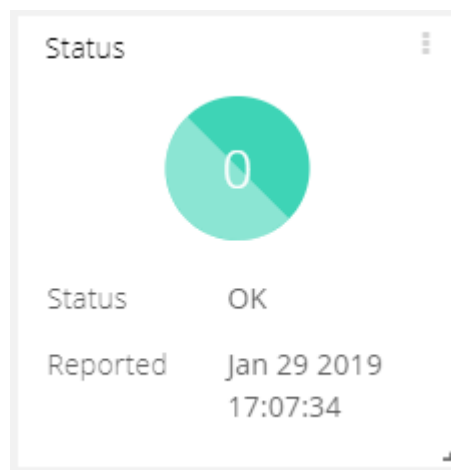
The existing ranges and colours are pre-configured to match the expected range of reported error codes but you may adjust the ranges and colours used as well as add more ranges if desired.

Add new ranges by clicking the **Add Range** button.

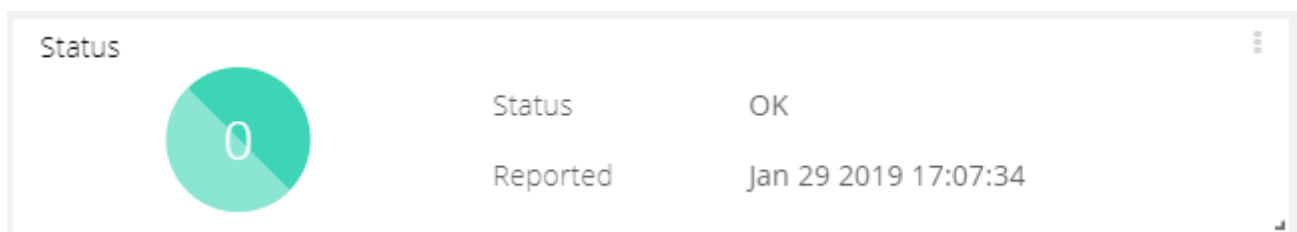
Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

Dashboard Appearance



Note that this widget has been designed to enable it to be resized into a narrow strip to enable it to sit at the top or bottom of your dashboards.



Dashboard Actions

The widget has no specific actions or functionality when displayed on the dashboard.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See

[Widget Menu Items](#)

Tank

This indicator widget shows the value of the variable by displaying a circular vessel indicating fill level.

Add a Tank Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

Tank

← BACK

Data

+ Add Variables

Appearance

Name: Tank widget

Font family: Open Sans

Decimal points: Auto

Date format: May 30 2019 13:06

Range value: 0 100

DataFormat: Raw

Color: Set by widget

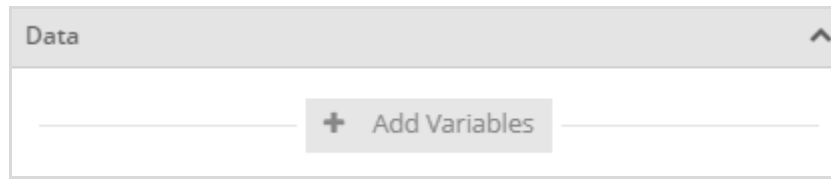
✓

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

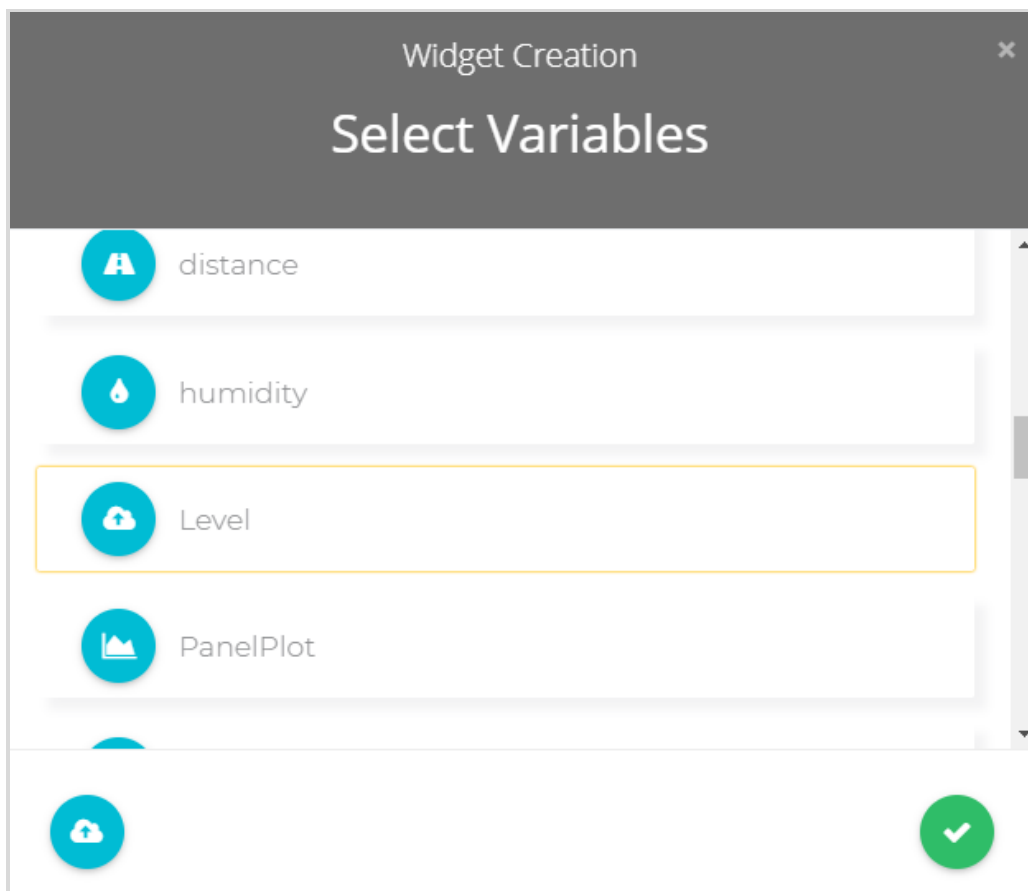
Static Dashboard

When placed on a static dashboard




Click Add Variables to add a variable to the widget. Because this is a static widget you will be selecting a specific variable from a specific device. A pop-up will be displayed allowing you to select a single variable from any device.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select one variable for this widget.

Click the  to close the pop-up to return to the property panel.

Data


Level (megatewaybox01 (ISS Device))

Aggregation method

Average

Span

Today

You can now see the variable you selected added to the list. If you hover over the variable you will see a delete icon  appear so it can be removed from the list.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

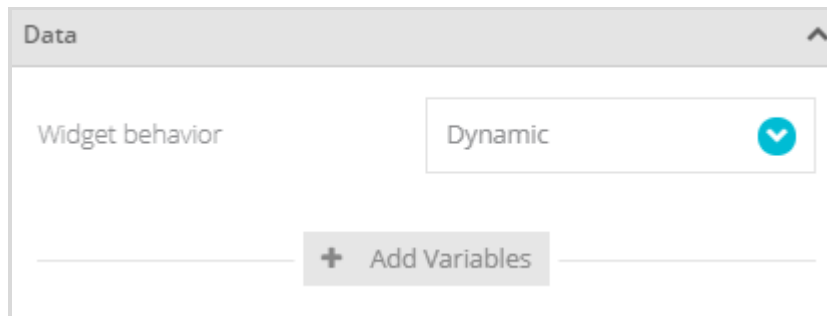
You can also see additional options against **each** variable.

Aggregation Method – Select how the value displayed will be calculated. You can choose from Average, Count, Maximum, Minimum, Last Value and Sum. As you select different aggregate options there may be a secondary time selection named **Span**. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display the value as the average of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Count</i>	Span	Display the value as the number of data values received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Last Value</i>		Display the last data value received for the specified variable.
<i>Maximum</i>	Span	Display the value as the maximum value of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Minimum</i>	Span	Display the value as the minimum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Sum</i>	Span	Display the value as the sum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.

When the span is set to **Set By Dashboard** the span can be changed by selecting it in the dashboard's settings bar.

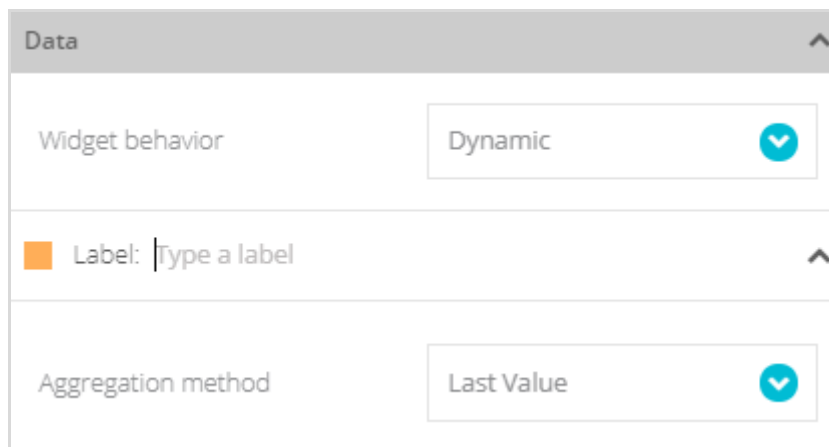
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a settings panel titled 'Data' with a close button (upward arrow) in the top right corner. Inside the panel, there is a 'Widget behavior' section with a dropdown menu currently set to 'Dynamic', which has a blue downward arrow icon. Below this, there is a horizontal line followed by a grey button with a plus sign and the text 'Add Variables'.

Widget Behaviour allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section.

However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



This screenshot shows the 'Data' settings panel with the 'Widget behavior' dropdown still set to 'Dynamic'. Below the 'Add Variables' button, a new section has appeared. It starts with an orange square icon, followed by the text 'Label: |Type a label'. To the right of this text is a small upward arrow icon. Below this section, there is an 'Aggregation method' dropdown menu currently set to 'Last Value', which also has a blue downward arrow icon.

Simply click where it says **Type a Label** and enter the label name.

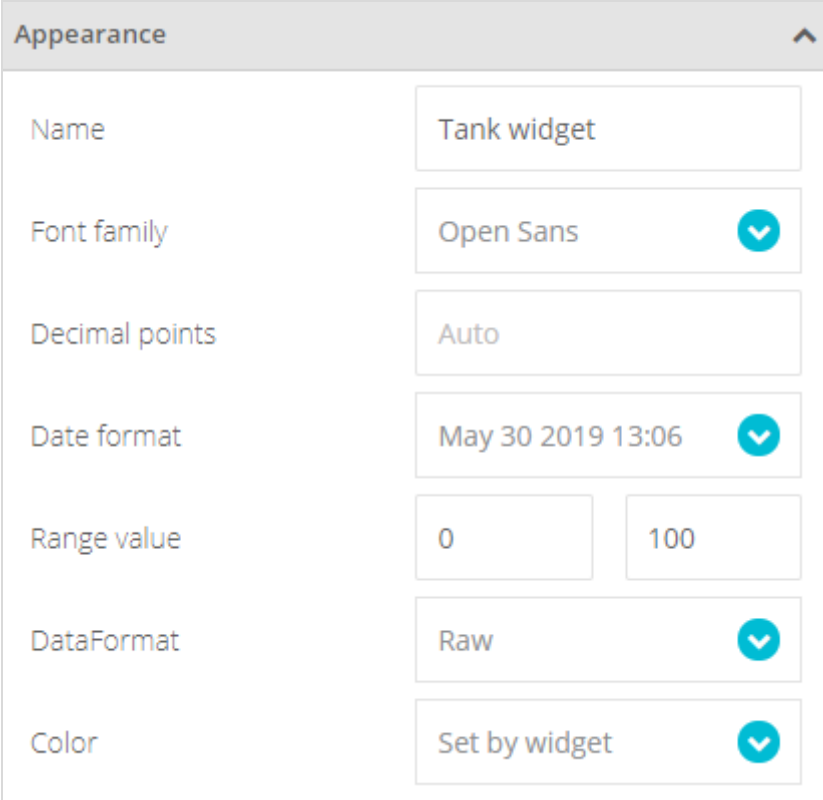
The Aggregation Method settings are the same as for the Static Dashboard.

As for static variables, click the item's coloured square to display the colour selection pop-up.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

You can choose whether to let the widget display the data simply or you can choose to edit the HTML code directly for a more customised look.



The screenshot shows a panel titled 'Appearance' with a list of configuration options for a widget. The options are: Name (set to 'Tank widget'), Font family (set to 'Open Sans'), Decimal points (set to 'Auto'), Date format (set to 'May 30 2019 13:06'), Range value (with input fields for '0' and '100'), DataFormat (set to 'Raw'), and Color (set to 'Set by widget'). Each option is in a row with a label on the left and a control element on the right.

Appearance	
Name	Tank widget
Font family	Open Sans
Decimal points	Auto
Date format	May 30 2019 13:06
Range value	0 100
DataFormat	Raw
Color	Set by widget

- | | |
|-----------------------|---|
| Name | Enter the title of the widget to appear at its top left when displayed on the dashboard. |
| Font Family | Select a font to use for the widget text. |
| Decimal Points | Enter the number of decimal places to show in the numeric value displayed on the tank and in the floating information panel when the mouse pointer is hovered over the widget. |
| Date Format | Select a suitable date format from the list to display in the floating information panel when the mouse pointer is hovered over the widget. |
| Range Value | Enter the values at which the tank level shows the minimum and maximum. |
| Data Format | Choose to display either the Raw value or the value as a Percentage on the widget. |
| Colour | Select Set By Widget to let the widget choose a colour.
Select Variable's Default to use the colour set for the variable.
Select Colour Logic to define a set of value ranges to determine the colour to display.
Click Add Colour Logic to add to the default set of colours. |

Select color logic

Tank widget

Range	Color	
0	#C4C4C4	
1	#4BA651	

Add Range

Cancel Accept

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon to the right of a range.

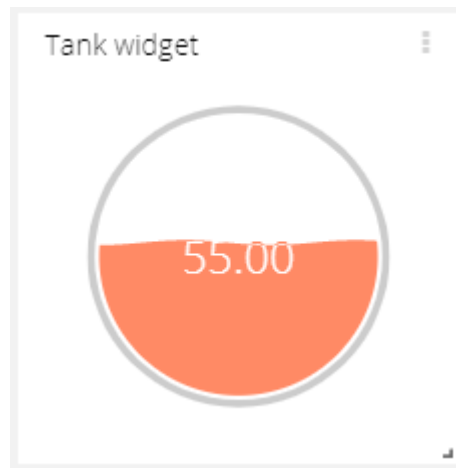
Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey fill when the variable value is less than 1 but green fill when the variable value is 1 or greater.

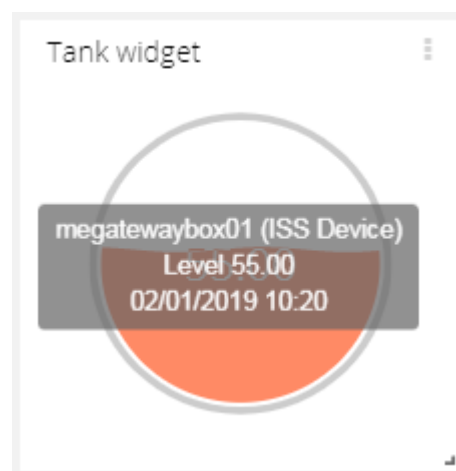


Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the widget displays a panel showing the device name, variable name and value for each variable.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Thermometer

This indicator widget shows the value of the variable by displaying a traditional thermometer symbol with level indicator.

Add a Thermometer Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

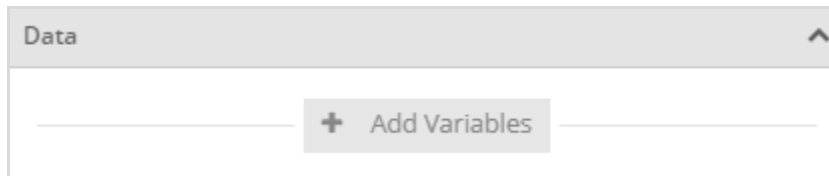
The screenshot shows the 'Thermometer' property panel. At the top is a dark grey header with the title 'Thermometer' and a close button (X). Below the header is a white bar with a blue back arrow and the text 'BACK'. The panel is divided into two main sections: 'Data' and 'Appearance', each with a grey header and an expand/collapse arrow. The 'Data' section contains a text input field and a button labeled '+ Add Variables'. The 'Appearance' section contains several configuration options: 'Name' (text input with 'Thermometer widget'), 'Font family' (dropdown menu with 'Open Sans'), 'Decimal points' (text input with 'Auto'), 'Date format' (dropdown menu with 'May 30 2019 13:08'), 'Range value' (two text input fields with '0' and '100'), and 'Color' (dropdown menu with 'Set by widget'). A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

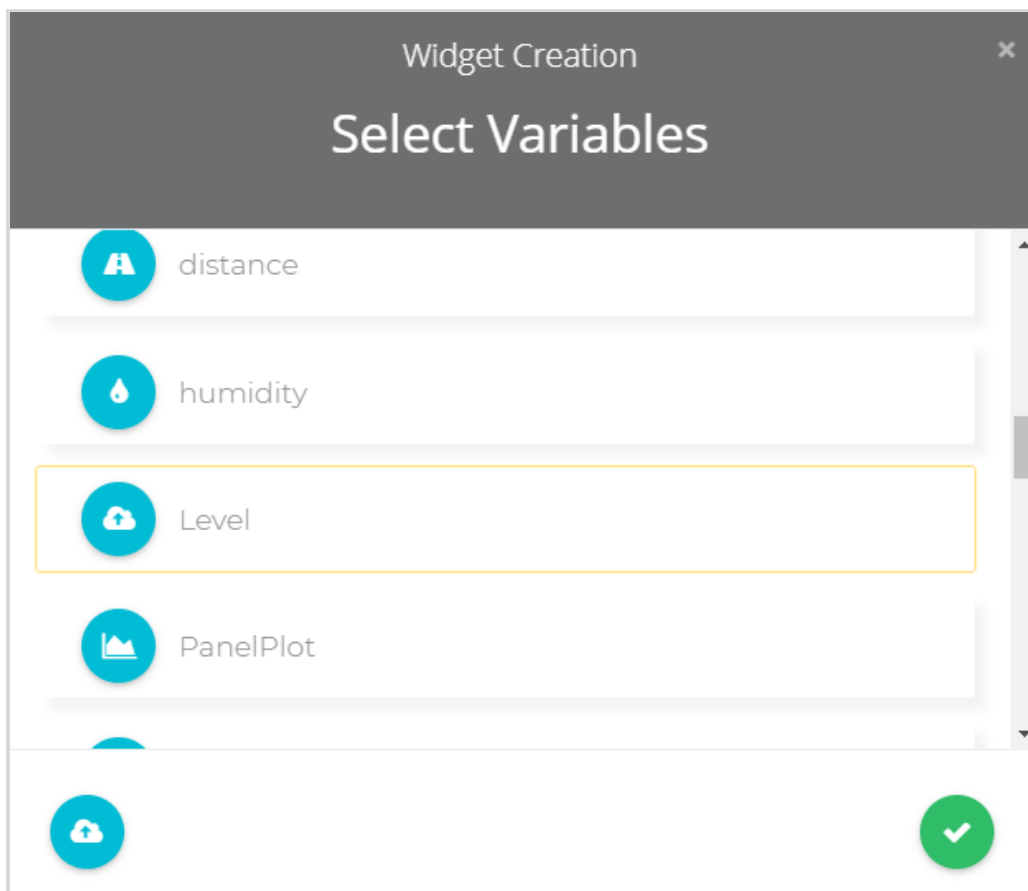
Static Dashboard

When placed on a static dashboard




Click Add Variables to add a variable to the widget. Because this is a static widget you will be selecting a specific variable from a specific device. A pop-up will be displayed allowing you to select a single variable from any device.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select one variable for this widget.

Click the  to close the pop-up to return to the property panel.

Data


Level (megatewaybox01 (ISS Device))

Aggregation method

Average

Span

Today

You can now see the variable you selected added to the list. If you hover over the variable you will see a delete icon  appear so it can be removed from the list.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

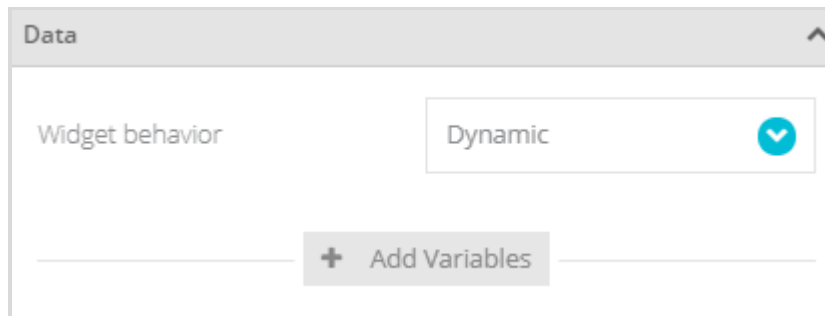
You can also see additional options against **each** variable.

Aggregation Method – Select how the value displayed will be calculated. You can choose from Average, Count, Maximum, Minimum, Last Value and Sum. As you select different aggregate options there may be a secondary time selection named **Span**. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display the value as the average of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Count</i>	Span	Display the value as the number of data values received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Last Value</i>		Display the last data value received for the specified variable.
<i>Maximum</i>	Span	Display the value as the maximum value of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Minimum</i>	Span	Display the value as the minimum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Sum</i>	Span	Display the value as the sum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.

When the span is set to **Set By Dashboard** the span can be changed by selecting it in the dashboard's settings bar.

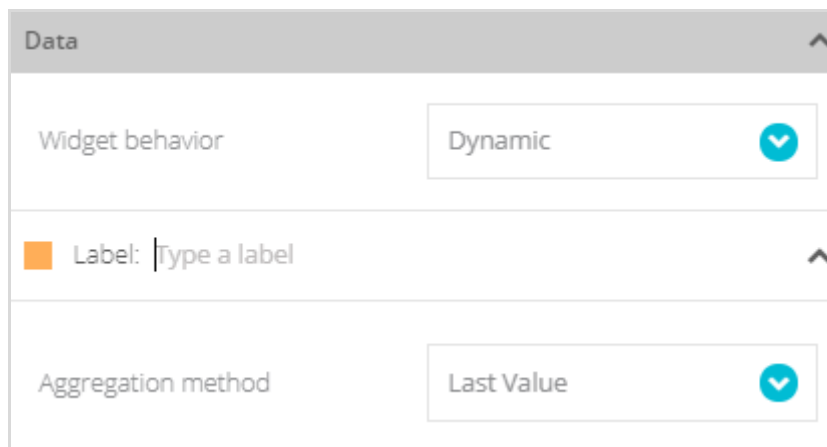
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a settings panel titled 'Data' with a close button (upward arrow) in the top right corner. Inside the panel, there is a 'Widget behavior' section with a dropdown menu currently set to 'Dynamic', which has a blue downward arrow icon. Below this, there is a horizontal line and a button labeled '+ Add Variables'.

Widget Behaviour allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section.

However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



This screenshot shows the 'Data' settings panel with the 'Widget behavior' dropdown still set to 'Dynamic'. Below the 'Add Variables' button, a new section has appeared. It features an orange square icon, the text 'Label: |Type a label', and a small upward arrow icon. Below this section, there is an 'Aggregation method' dropdown menu currently set to 'Last Value' with a blue downward arrow icon.

Simply click where it says **Type a Label** and enter the label name.

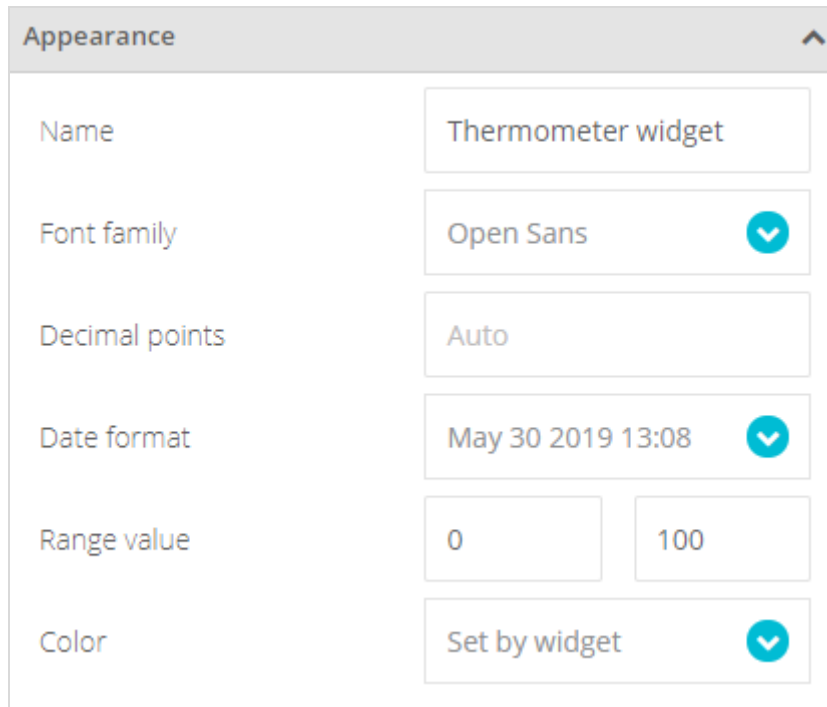
The Aggregation Method settings are the same as for the Static Dashboard.

As for static variables, click the item's coloured square to display the colour selection pop-up.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

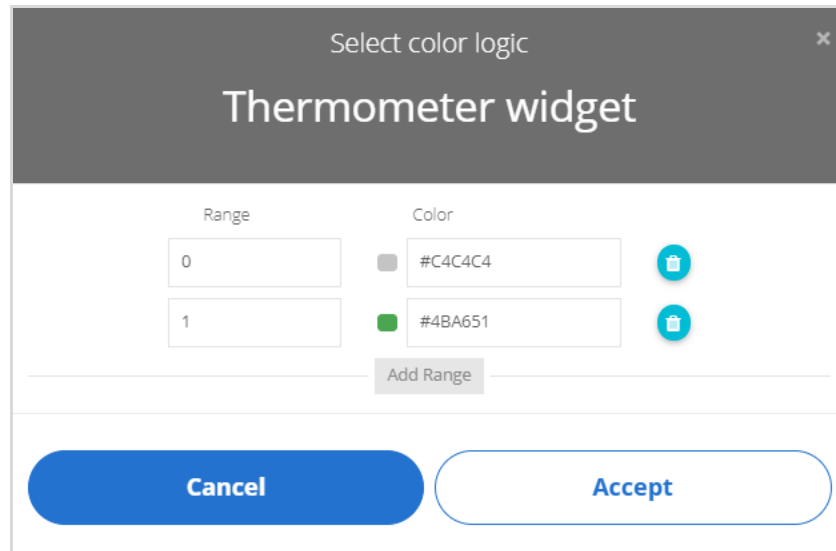
You can choose whether to let the widget display the data simply or you can choose to edit the HTML code directly for a more customised look.



The screenshot shows a configuration panel titled "Appearance" with a close button (X) in the top right corner. The panel contains several settings:

- Name:** A text input field containing "Thermometer widget".
- Font family:** A dropdown menu showing "Open Sans" with a blue downward arrow.
- Decimal points:** A text input field containing "Auto".
- Date format:** A dropdown menu showing "May 30 2019 13:08" with a blue downward arrow.
- Range value:** Two side-by-side text input fields. The left field contains "0" and the right field contains "100".
- Color:** A dropdown menu showing "Set by widget" with a blue downward arrow.

- | | |
|-----------------------|--|
| Name | Enter the title of the widget to appear at its top left when displayed on the dashboard. |
| Font Family | Select a font to use for the widget text. |
| Decimal Points | Enter the number of decimal places to show in the numeric value displayed on the tank and in the floating information panel when the mouse pointer is hovered over the widget. |
| Date Format | Select a suitable date format from the list to display on the widget and in the floating information panel when the mouse pointer is hovered over the widget. |
| Range Value | Enter the values at which the tank level shows the minimum and maximum. |
| Colour | <p>Select Set By Widget to let the widget choose a colour.</p> <p>Select Variable's Default to use the colour set for the variable.</p> <p>Select Colour Logic to define a set of value ranges to determine the colour to display.</p> <p>Click Add Colour Logic to add to the default set of colours.</p> |



Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

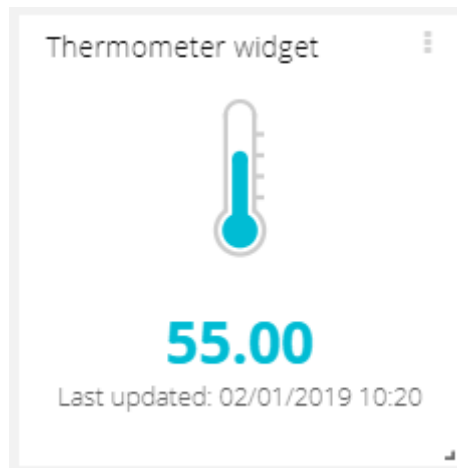
Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey fill when the variable value is less than 1 but green fill when the variable value is 1 or greater.

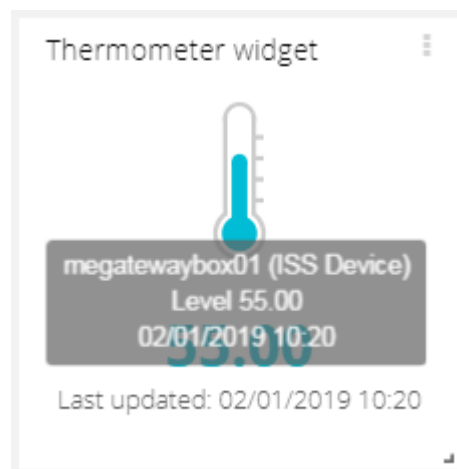


Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the widget displays a panel showing the device name, variable name and value for each variable.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Battery

This indicator widget shows the value of the variable by displaying a traditional battery symbol with level indicator.

Add a Battery Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

Battery

← BACK

Data

+ Add Variables

Appearance

Name	Battery widget
Font family	Open Sans
Decimal points	Auto
Date format	May 30 2019 13:14
Range value	0 100
Color	Set by widget

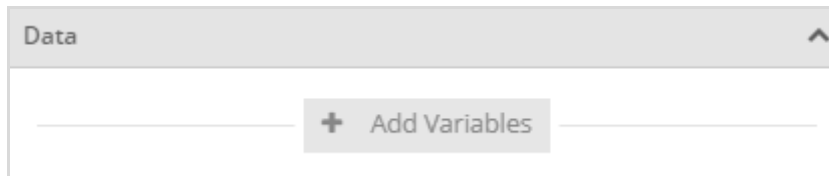
✓

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

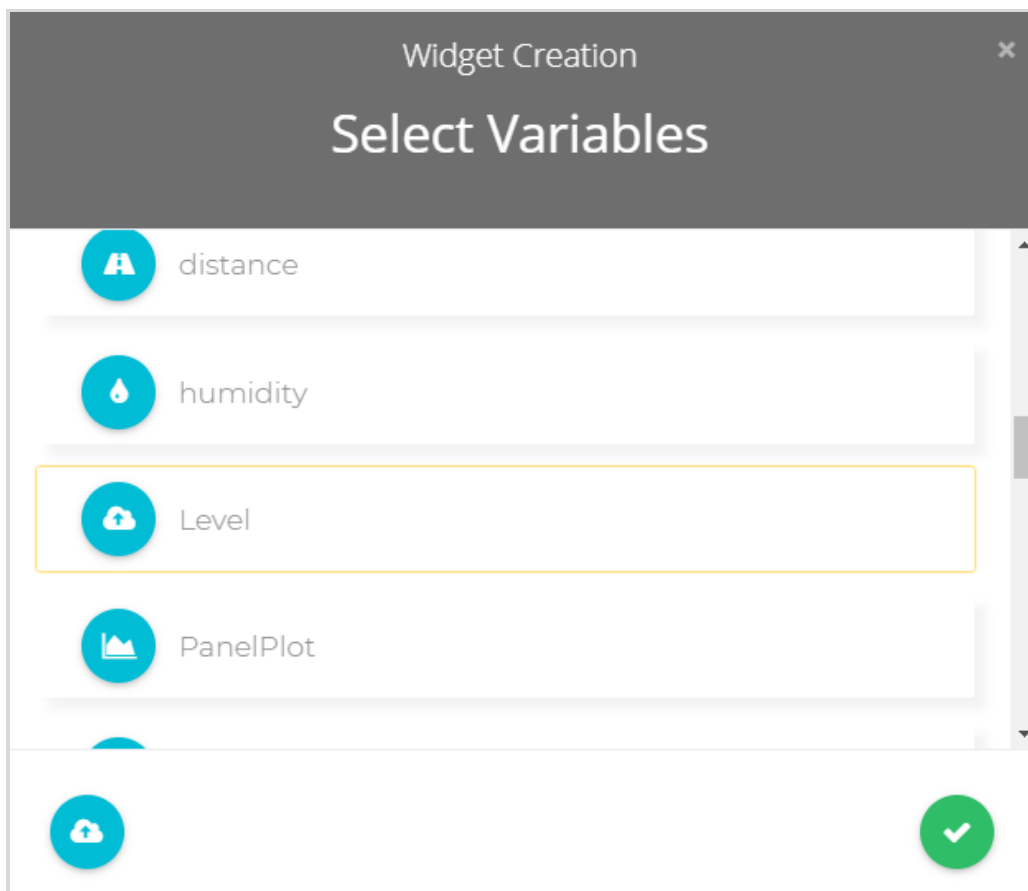
Static Dashboard

When placed on a static dashboard




Click Add Variables to add a variable to the widget. Because this is a static widget you will be selecting a specific variable from a specific device. A pop-up will be displayed allowing you to select a single variable from any device.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can only select one variable for this widget.

Click the  to close the pop-up to return to the property panel.

Data


Level (megatewaybox01 (ISS Device))

Aggregation method

Average

Span

Today

You can now see the variable you selected added to the list. If you hover over the variable you will see a delete icon  appear so it can be removed from the list.

To change the colour of the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

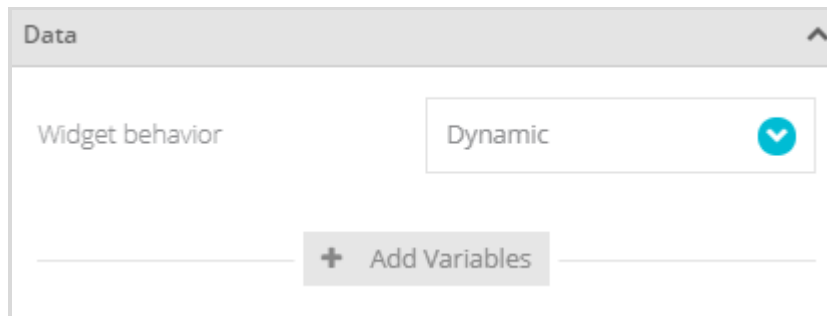
You can also see additional options against **each** variable.

Aggregation Method – Select how the value displayed will be calculated. You can choose from Average, Count, Maximum, Minimum, Last Value and Sum. As you select different aggregate options there may be a secondary time selection named **Span**. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display the value as the average of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Count</i>	Span	Display the value as the number of data values received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Last Value</i>		Display the last data value received for the specified variable.
<i>Maximum</i>	Span	Display the value as the maximum value of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Minimum</i>	Span	Display the value as the minimum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.
<i>Sum</i>	Span	Display the value as the sum of all data received over the specified Span. The span can be Last Month, Last Week, This Month, Today, Yesterday or Set By Dashboard.

When the span is set to **Set By Dashboard** the span can be changed by selecting it in the dashboard's settings bar.

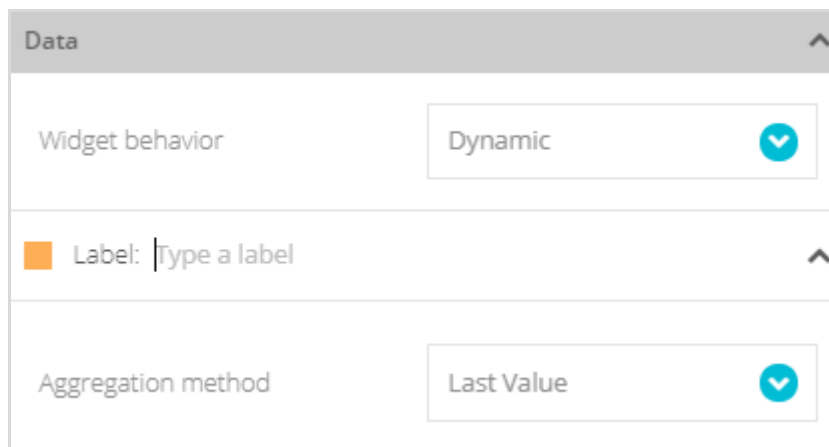
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a settings panel titled 'Data' with a close icon in the top right. Inside, the 'Widget behavior' is set to 'Dynamic' via a dropdown menu. Below this, there is a button labeled '+ Add Variables'.

Widget Behaviour allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section.

However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



This screenshot shows the 'Data' settings panel after clicking 'Add Variables'. A new section has been added with a colored square icon and the text 'Label: Type a label'. Below this, the 'Aggregation method' is set to 'Last Value' via a dropdown menu.

Simply click where it says **Type a Label** and enter the label name.

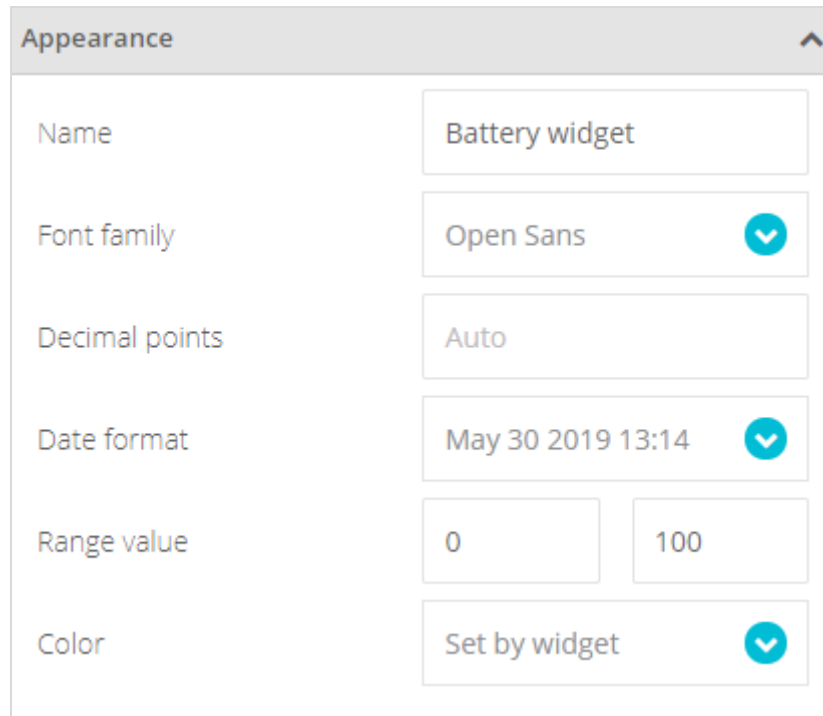
The Aggregation Method settings are the same as for the Static Dashboard.

As for static variables, click the item's coloured square to display the colour selection pop-up.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

You can choose whether to let the widget display the data simply or you can choose to edit the HTML code directly for a more customised look.



The screenshot shows a configuration panel titled "Appearance" with a close button (X) in the top right corner. The panel contains the following settings:

- Name:** A text input field containing "Battery widget".
- Font family:** A dropdown menu showing "Open Sans" with a blue downward arrow.
- Decimal points:** A text input field containing "Auto".
- Date format:** A dropdown menu showing "May 30 2019 13:14" with a blue downward arrow.
- Range value:** Two side-by-side text input fields. The left field contains "0" and the right field contains "100".
- Color:** A dropdown menu showing "Set by widget" with a blue downward arrow.

- | | |
|-----------------------|--|
| Name | Enter the title of the widget to appear at its top left when displayed on the dashboard. |
| Font Family | Select a font to use for the widget text. |
| Decimal Points | Enter the number of decimal places to show in the numeric value displayed on the widget and in the floating information panel when the mouse pointer is hovered over the widget. |
| Date Format | Select a suitable date format from the list to display on the widget and in the floating information panel when the mouse pointer is hovered over the widget. |
| Range Value | Enter the values at which the tank level shows the minimum and maximum. |
| Colour | <p>Select Set By Widget to let the widget choose a colour.</p> <p>Select Variable's Default to use the colour set for the variable.</p> <p>Select Colour Logic to define a set of value ranges to determine the colour to display.</p> <p>Click Add Colour Logic to add to the default set of colours.</p> |

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

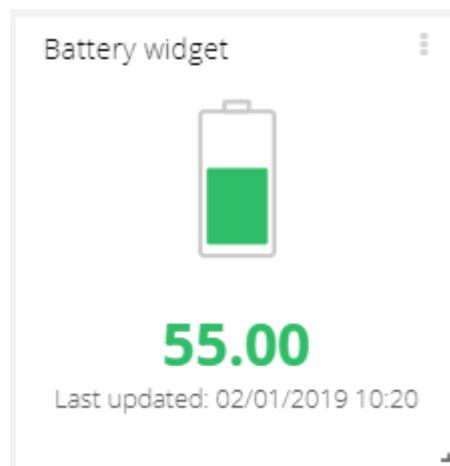
Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey fill when the variable value is less than 1 but green fill when the variable value is 1 or greater.

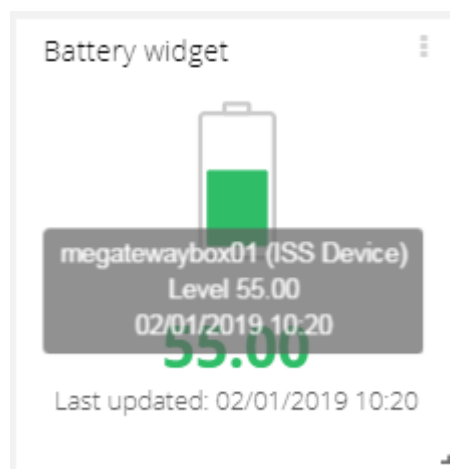


Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the widget displays a panel showing the device name, variable name and value for each variable.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

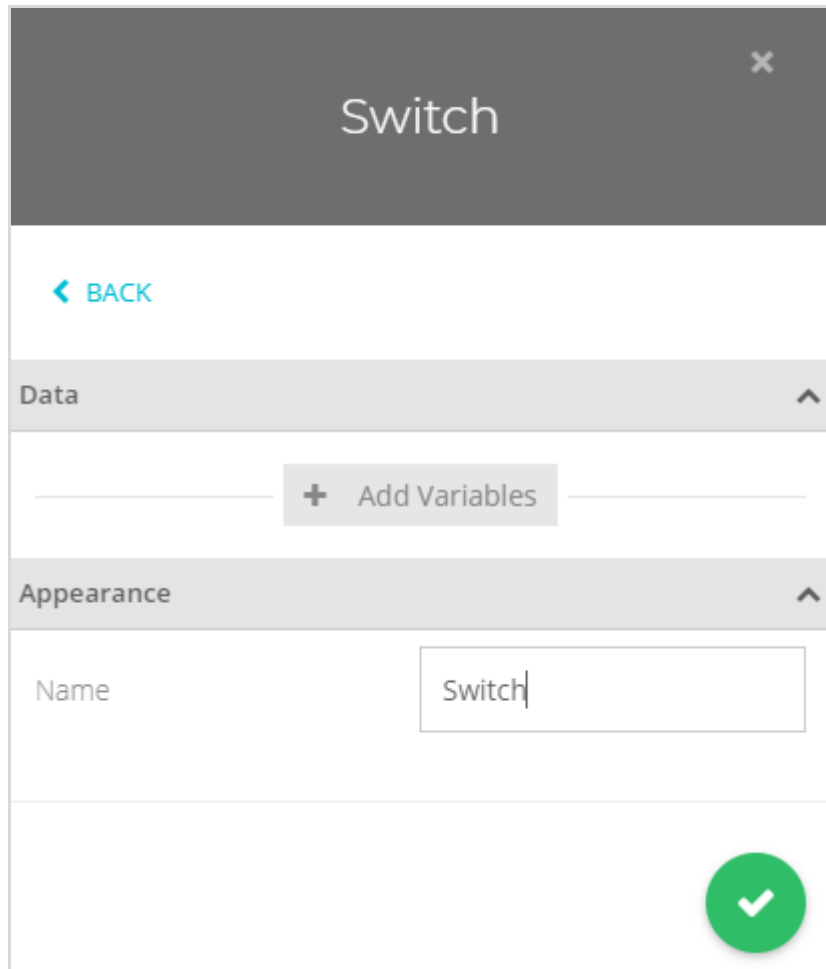
Switch

This provides an on-dashboard user switch to change the value of a variable between zero and one (0 and 1) by clicking on the button. The variable can then be used in events, synthetic variables or used to control suitable devices connected to the platform.

Add a Switch Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.



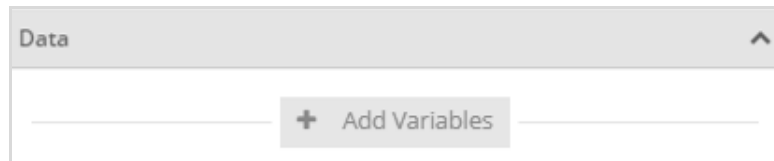
The screenshot shows the 'Switch' widget's property panel. At the top is a dark grey header with the title 'Switch' and a close button (X). Below the header is a white bar with a blue back arrow and the text 'BACK'. The main content area is divided into two sections: 'Data' and 'Appearance'. The 'Data' section has a light grey header and a white body with a text input field and a '+ Add Variables' button. The 'Appearance' section has a light grey header and a white body with a 'Name' label and a text input field containing the text 'Switch'. A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

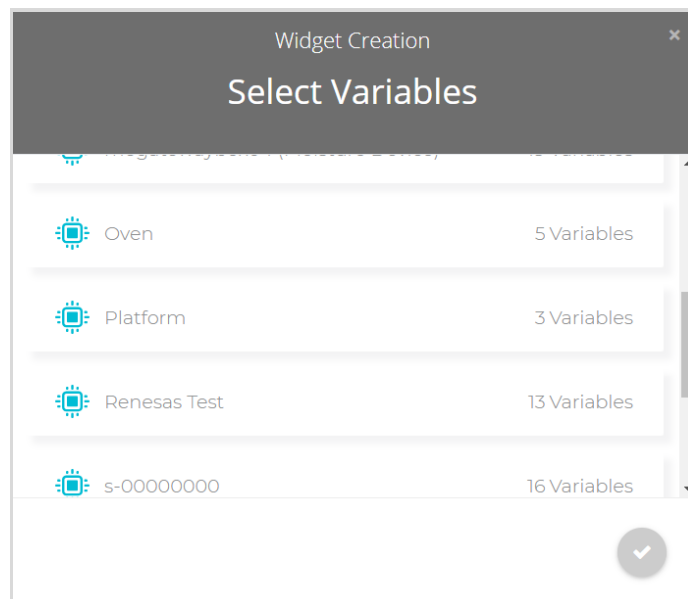
Static Dashboard

When placed on a static dashboard

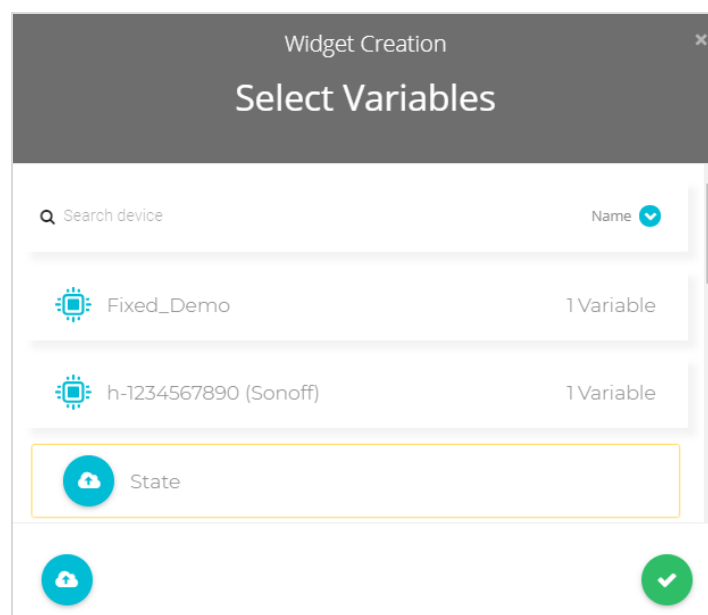



Click Add Variables to add variables (traces) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices. Adding multiple variables will result in multiple indicators all sharing the same widget.

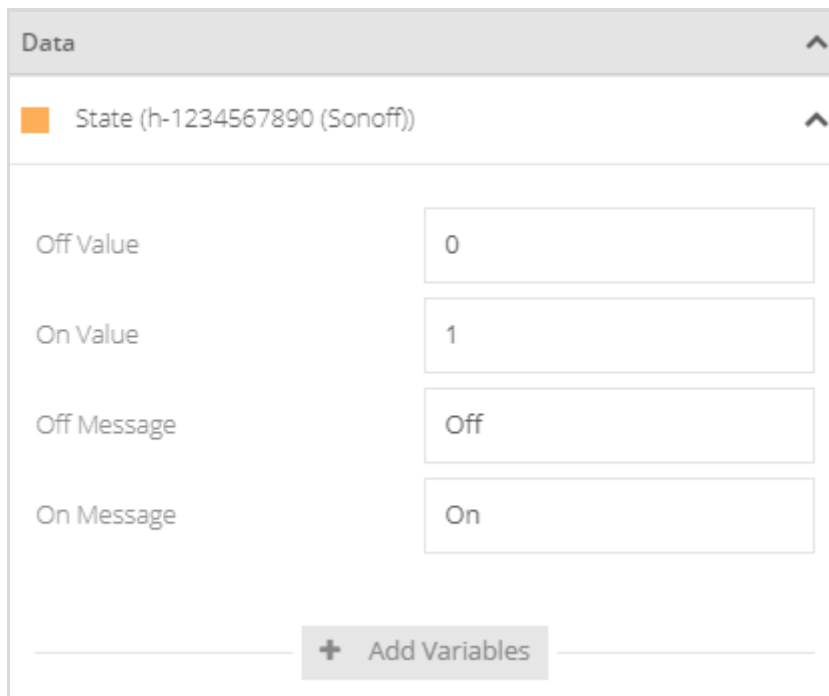
Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables for selection. The selected variables would normally be new Raw Variables created by the user on a device.



Click the  to close the pop-up to return to the property panel.



The screenshot shows a 'Data' panel for a switch widget. It contains a list of variables with the following settings:

Property	Value
Off Value	0
On Value	1
Off Message	Off
On Message	On

At the bottom of the panel is a button labeled '+ Add Variables'.

You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

You will also see further settings for each variable added.

Off Value You can change the default value of zero to apply to the variable when the switch has been changed to the off state.

On Value You can change the default value of one to apply to the variable when the switch has been changed to the on state.

Off Message Set the message to appear under the switch when it is in the off state. For example 'Deactivated', 'Closed' etc

On Message Set the message to appear under the switch when it is in the on state. For example 'Activated', 'Open' etc



Click to close the properties panel and place the widget onto the dashboard.

When placed on a dynamic dashboard this option will be visible.


The screenshot shows a configuration panel titled 'Data'. Inside, there is a label 'Widget behavior' followed by a dropdown menu currently showing 'Dynamic' with a blue checkmark icon. Below this is a grey button with a plus sign and the text 'Add Variables'.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

The screenshot shows the 'Data' configuration panel with 'Widget behavior' set to 'Dynamic'. Below this, there is a section for adding variables, indicated by an orange square icon and the text 'Label: Type a label'. Underneath this section are four input fields: 'Off Value' with '0', 'On Value' with '1', 'Off Message' with 'Off', and 'On Message' with 'On'. At the bottom is the 'Add Variables' button.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

See the Static Dashboard section for a description of the further options available once the variable has been added.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance

Name

Switch

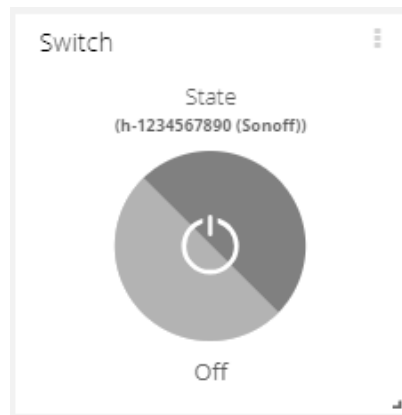
Name

Enter the title of the widget to appear at its top left when displayed on the dashboard.



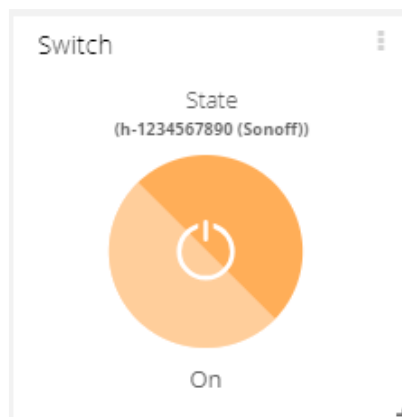
Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions

Click on the switch to toggle the linked variable value between 0 and 1 (or the custom values). The switch color will change between grey and the selected colour for the variable. When the dashboard first opens (Or the variable is updated by another dashboard or device) the switch widget will update to reflect the variables current value.



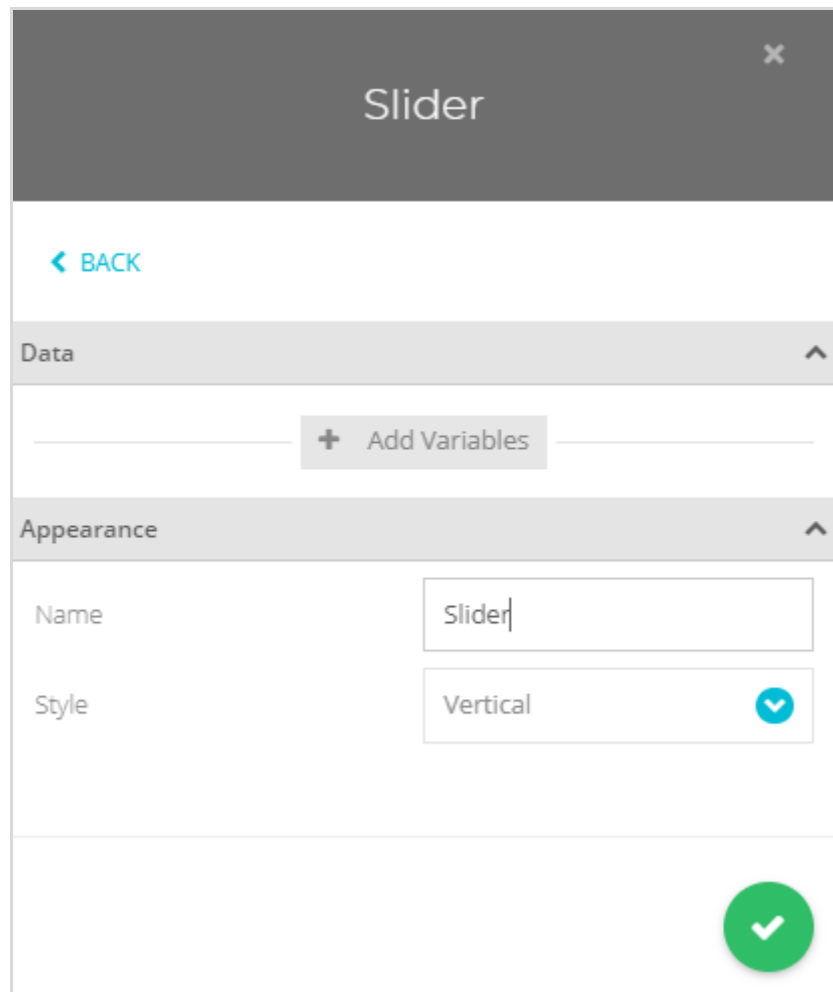
Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Slider

The slider widget allows you to set the value of a variable within a preset range by dragging a slider up and down. Add a Slider Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.



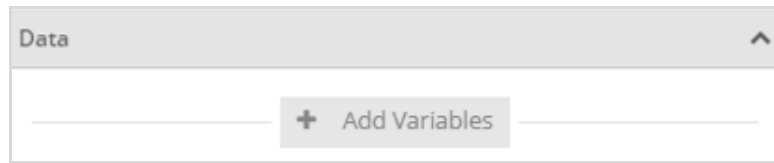
The screenshot shows the 'Slider' widget's property panel. At the top is a dark grey header with the title 'Slider' and a close button (X). Below the header is a white bar with a blue '< BACK' button. The main area is divided into two sections: 'Data' and 'Appearance'. The 'Data' section has a light grey header and a white body with a text input field and a '+ Add Variables' button. The 'Appearance' section has a light grey header and a white body with two rows: 'Name' with a text input field containing 'Slider', and 'Style' with a dropdown menu showing 'Vertical' and a blue chevron icon. At the bottom right is a large green circular button with a white checkmark.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

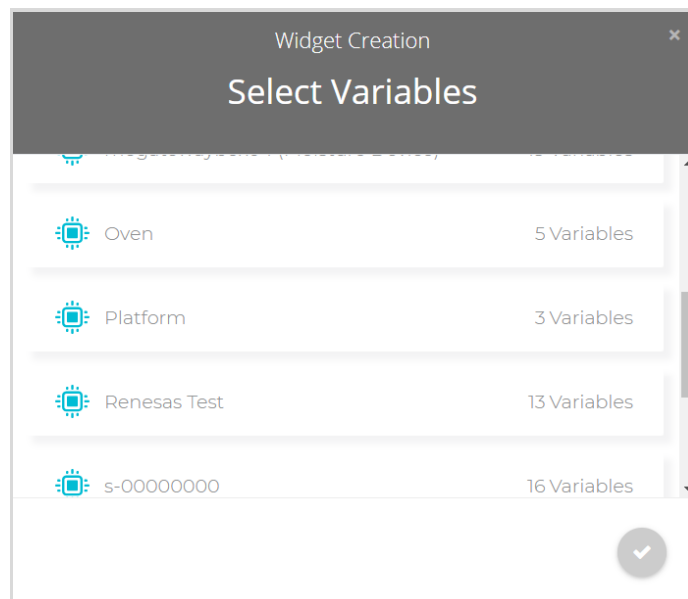
Static Dashboard

When placed on a static dashboard

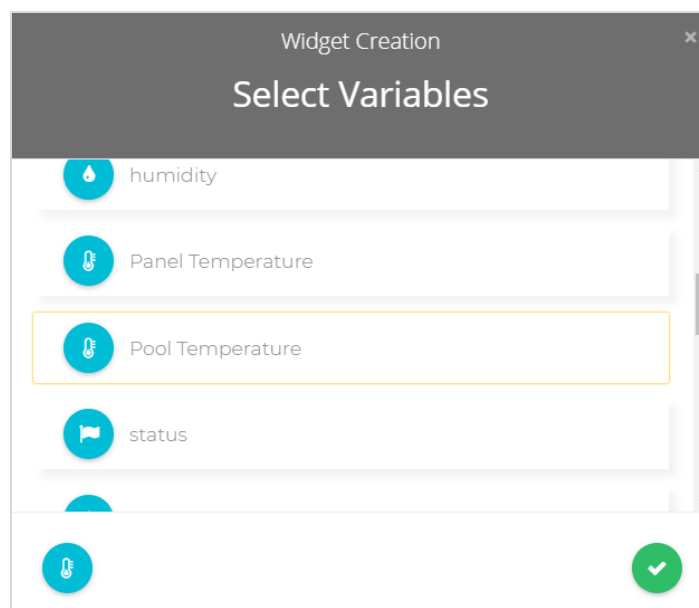



Click Add Variables to add variables (traces) to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices. Adding multiple variables will result in multiple sliders all sharing the same widget.

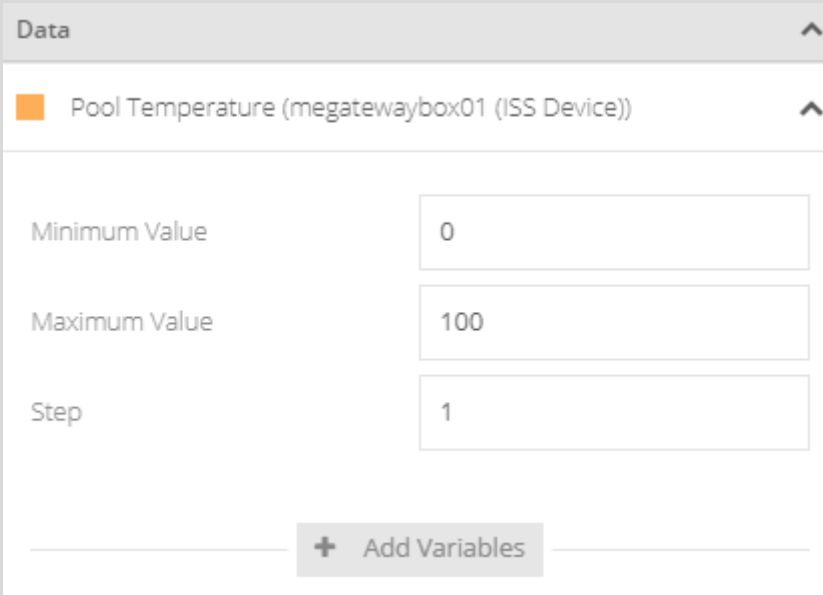
Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables for selection. Only Raw Variables will be available for selection.




Click the  to close the pop-up to return to the property panel.



The screenshot shows a 'Data' panel with a header bar. Below the header, there is a list item 'Pool Temperature (megatewaybox01 (ISS Device))' with an orange square icon and an upward arrow. Underneath this list item, there are three input fields: 'Minimum Value' with the value '0', 'Maximum Value' with the value '100', and 'Step' with the value '1'. At the bottom of the panel, there is a button labeled '+ Add Variables'.

You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

You will also see further settings for each variable added.

Minimum Value Set the value to assign to the variable when the slider is in the minimum position.

Maximum Value Set the value to assign to the variable when the slider is in the maximum position.

Step Set the value of the steps that the variable will be incremented by as the slider is moved.



Click to close the properties panel and place the widget onto the dashboard.

When placed on a dynamic dashboard this option will be visible.


The screenshot shows a configuration panel titled 'Data'. It has a 'Widget behavior' dropdown menu currently set to 'Dynamic'. Below this is a button labeled '+ Add Variables'.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variables a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

The screenshot shows the 'Data' configuration panel with 'Widget behavior' set to 'Dynamic'. Below this, there is a section for adding variables. It starts with a label 'Label:' followed by a text input field containing 'Type a label'. Below this are three input fields for 'Minimum Value' (0), 'Maximum Value' (100), and 'Step' (1). At the bottom is a button labeled '+ Add Variables'.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variables** again to add more variables.

See the Static Dashboard section for a description of the further options available once the variable has been added.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance

Name

Slider

Style

Vertical

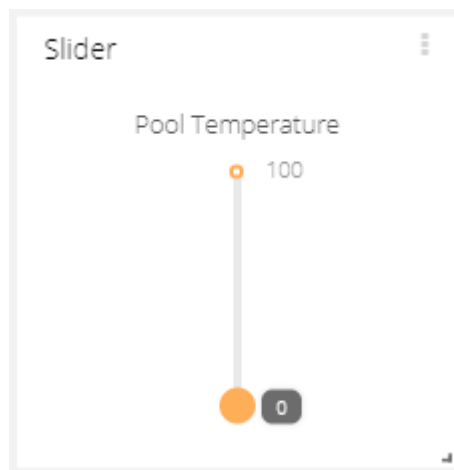
Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Style Choose whether the slider will appear horizontally or vertically.



Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



Dashboard Actions

Drag the handle of the slider to change the value of the assigned variable.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Clock

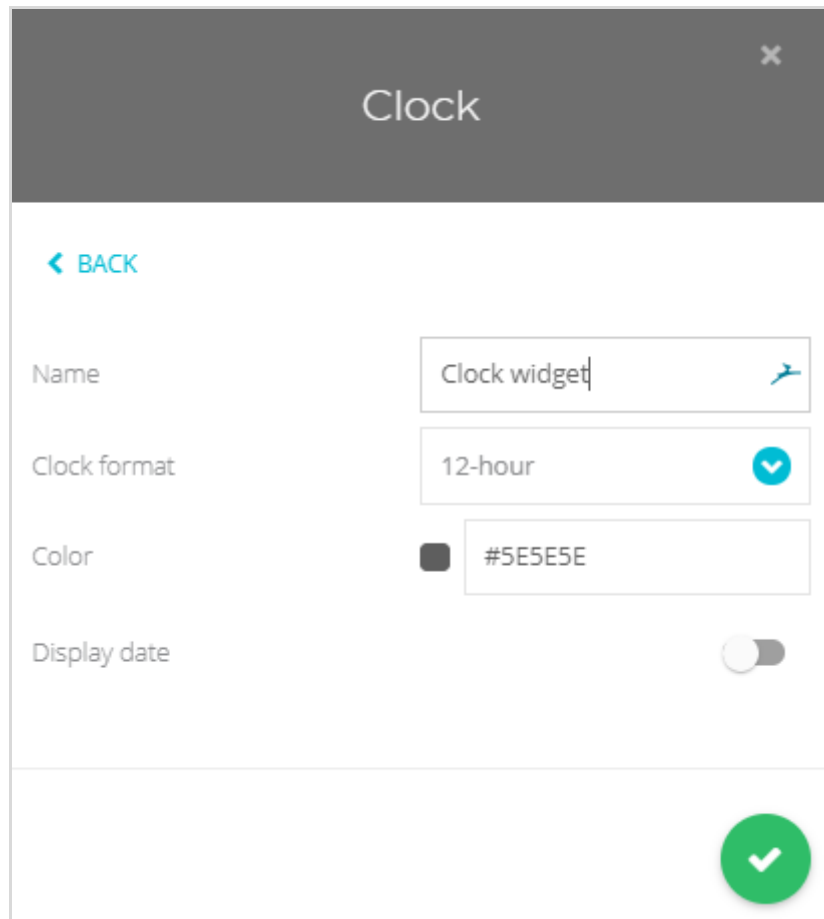
The Clock Widget adds a simple clock display to the dashboard with optional date displayed. Add a Clock Widget to display the property panel on the right of the screen.


Property Panel

The property panel has no sections.

Properties

This widget behaves the same whether the dashboard is static or dynamic.



- | | |
|---|---|
| Name | Enter the title of the widget to appear at its top left when displayed on the dashboard. |
| Clock Format | Select either 12 hour or 24 hour format. |
| Color | Click the coloured square swatch or colour code to open the colour selection pop-up. See Colour Selection |
| Display Date | Choose whether to display the date below the time. |
| Date Format | Only visible when you have selected to show the date. Choose the desired date format to display. |
|  | Click to close the properties panel and place the widget onto the dashboard. |

Dashboard Appearance



Dashboard Actions

This widget itself has no actions to perform after being placed on the dashboard.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Text

The Text Widget simply displays a fixed text message. The message will span multiple lines but cannot itself contain line breaks.

Property Panel

The property panel only has one section; Appearance.

Appearance Properties

This widget behaves the same whether the dashboard is static or dynamic.


The screenshot shows the configuration interface for a 'Text' widget. At the top is a dark grey header with the word 'Text' in white and a close icon. Below this is a light grey bar with a blue 'BACK' button. The main area is titled 'Appearance' in a grey bar. Below this, there are six settings: 'Name' (Text widget), 'Font family' (Open Sans), 'Color' (a black square and the code #5e5e5e), 'Text' (Message), 'Font size' (14), and 'Text alignment' (Center). Each setting has a corresponding input field or dropdown. At the bottom right is a large green circular button with a white checkmark.

Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Font family Select one of the available fonts.

Color Click the coloured square or colour code to open the colour selection pop-up. See [Colour](#)

[Selection](#)

- Text** Enter the text to appear inside the widget.
- Font Size** Select the size of the font used to display the text message.
- Text Alignment** Select whether the displayed text is left aligned, right aligned or centered within the widget.
-  Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



When viewed on the dashboard the Text widget simply displays the specified text.

Dashboard Actions

The widget has no specific actions or functionality when displayed on the dashboard. Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Values Table

This widget shows the the history of delivered values from selected variables across multiple devices in tabular format.

Add a Values Table Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

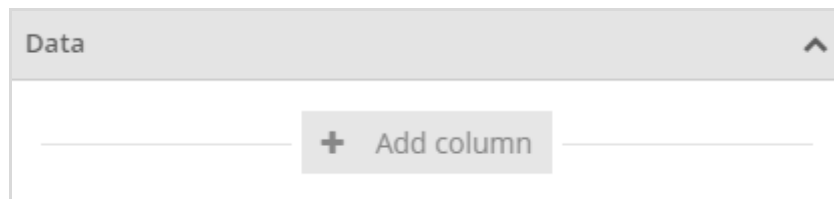
The screenshot displays the 'Values table' configuration interface. At the top is a dark grey header with the title 'Values table' and a close button (X). Below the header is a white bar with a blue back arrow and the text 'BACK'. The main area is divided into two sections: 'Data' and 'Appearance', each with a grey header and an expand/collapse arrow. The 'Data' section contains a text input field and a '+ Add column' button. The 'Appearance' section contains several settings: 'Name' (text input with 'Values Table'), 'Decimal points' (text input with 'Auto'), 'Date format' (dropdown menu with 'Set by Dashboard'), 'Borders' (checkbox with a grid icon, labeled 'Horizontal borders'), 'Border width' (text input with '1'), and 'Values per page' (dropdown menu with '10'). A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

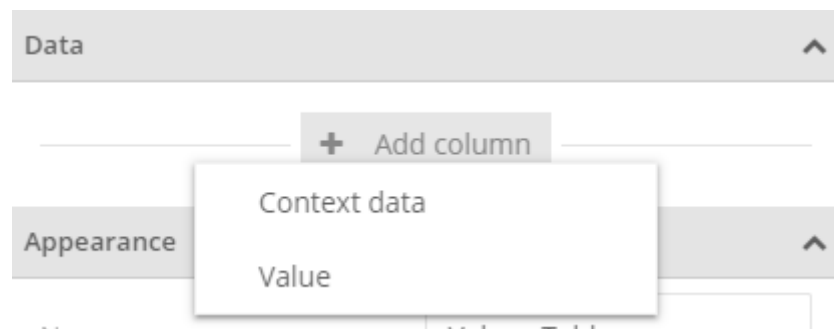
Static Dashboard

When placed on a static dashboard



Click **Add Column** to add variables to the widget. Because this is a static widget you will be selecting specific variables from specific devices.

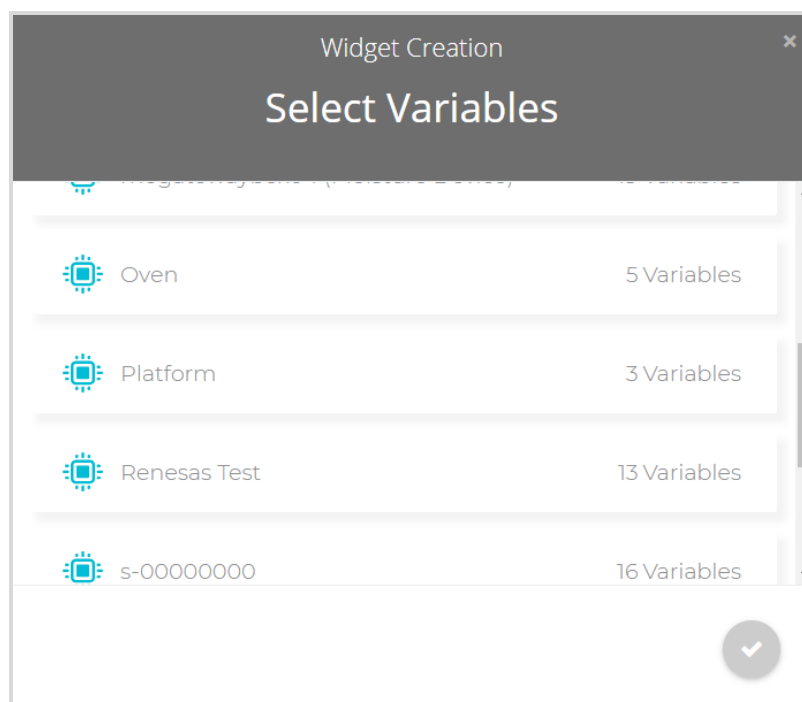
Clicking the button will offer a choice of adding a variable **Value** or **Context data**.



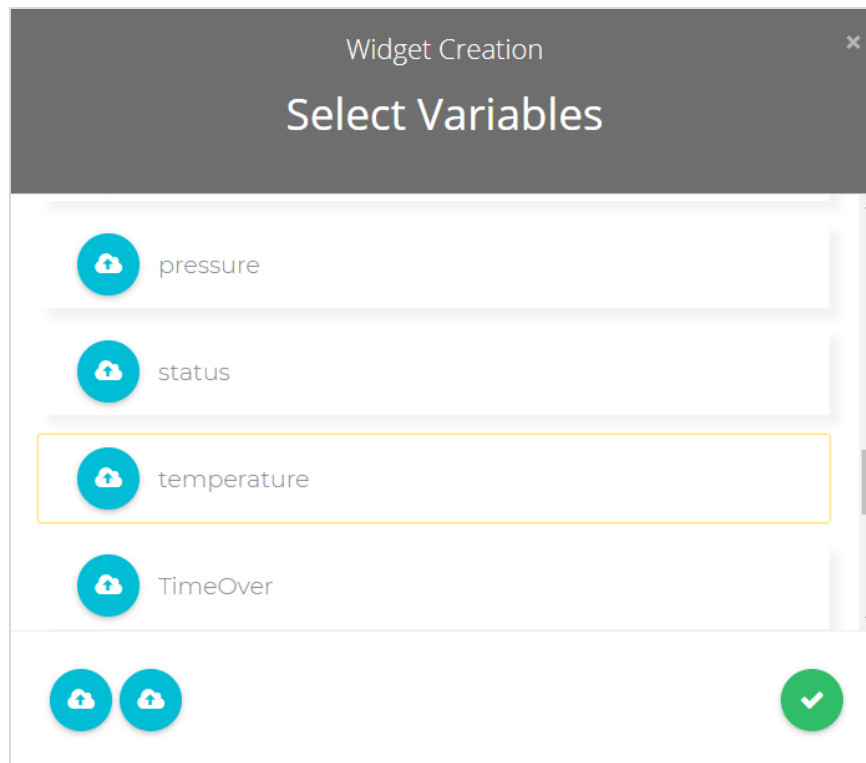
If you click **Value** you will be adding the numeric value for the variables you are about to select, whereas if you choose **Context Data** you will be choosing to display the textual context data. Remember that the only common context data present in all devices is the **Status** context in the **Status** variable.


Whichever you choose, a pop-up will be displayed allowing you to select multiple variables from multiple devices.

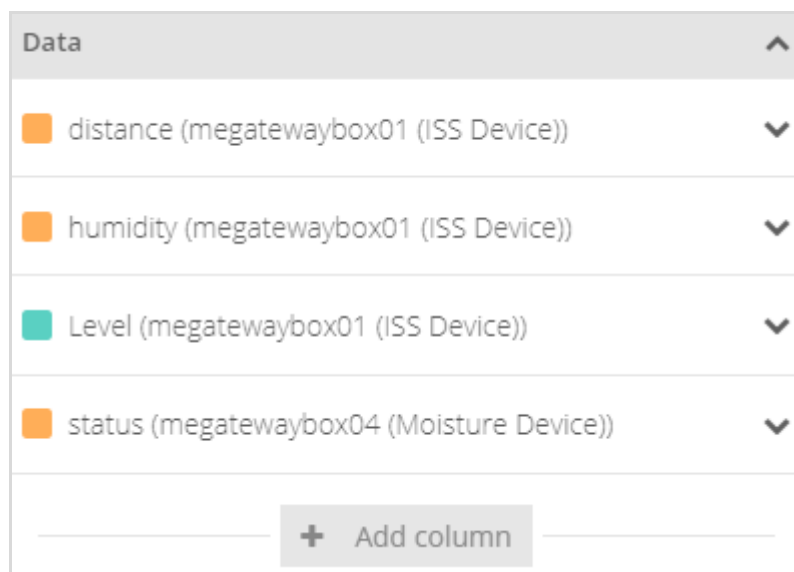
Click on a device to expand the list to show the variables contained in that device.




As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables for selection.



Click the  to close the pop-up to return to the property panel.



You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variable As Column** again to add more variables.

You can expand the Data section next to each variable to be presented with the settings appropriate for either a Value or a Context.

Choosing Value

Value selections will give the following options.

distance (megatewaybox01 (ISS Device))

Column name: Distance last value

Aggregation method: Last Value

Color: Variable's default

Display Device name: ☐


- Column Name** Set the text to appear in the header at the top of the column.
- Aggregation Method** Choose either last value or an aggregation type selecting from Average, Minimum, Sum or Count.
- Span** Only visible when the Aggregation Method is not Last Value. Simply select the time span over which the aggregation should work. Choose Set By Dashboard to use the common dashboard settings bar to select the time range. This will set the time span over which the raw gathered data will be used to generate the aggregated data.
- Sample Period** This selects how often the data is generated as a separate row in the table. For example, if the Aggregation Method is AVG and the Span is today and the Sample Period is 1 Hour then there will be up to 24 rows of data. i.e. the Average will be calculated and displayed where every row is an hour's worth of raw data but the raw data is only looked at over the last day.
- Colour** Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.
- Colour Logic** Only visible when Colour Logic is selected for the Colour option above. Click Add Colour Logic to add to the default set of colours.

Range	Color
0	<input type="checkbox"/> #C4C4C4
1	<input checked="" type="checkbox"/> #4BA651

Add Range

Cancel Accept

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

Display Device Name

Select to make the variable's device name appear in the header at the top of the column.

Choosing Context Data

Context Data selections will give the following options.

The screenshot shows a configuration window for a variable named 'status (megatewaybox04 (Moisture Device))'. It contains four settings:

- Column name:** A text field containing 'Status Context data'.
- Context key:** An empty text field.
- Color:** A dropdown menu currently showing 'Variable's default' with a blue downward arrow.
- Display Device name:** A toggle switch that is currently turned off.

Column Name

Set the text to appear in the header at the top of the column.

Context Key

This is where the context key is entered. Variables can contain multiple text contexts which are defined using a key. To see the Status information from our devices use variable status and Status context key.

Colour

Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.

Colour Logic

Only visible when Colour Logic is selected for the Colour option above. Click Add Colour Logic to add to the default set of colours.

The screenshot shows a 'Colour Logic' configuration window. It has two columns: 'Range' and 'Color'.

- Range:** Two input fields. The first contains '0' and the second contains '1'.
- Color:** Two rows. The first row has a grey color swatch and the hex code '#C4C4C4'. The second row has a green color swatch and the hex code '#4BA651'. Each row has a delete icon (a trash can) to its right.
- Add Range:** A button located below the range and color fields.
- Buttons:** At the bottom, there are two large buttons: 'Cancel' (blue) and 'Accept' (white with a blue border).

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

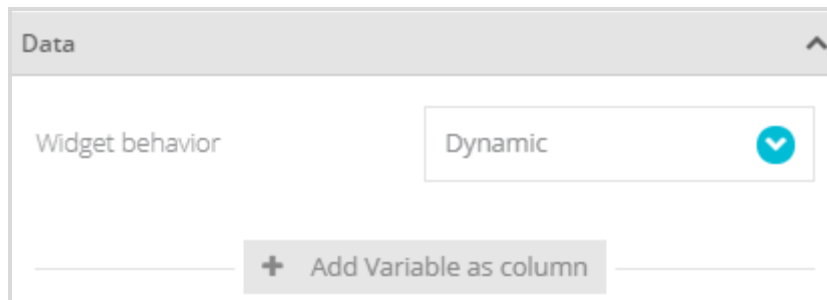
The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

Display Device Name

Select to make the variable's device name appear in the header at the top of the column.

Dynamic Dashboard

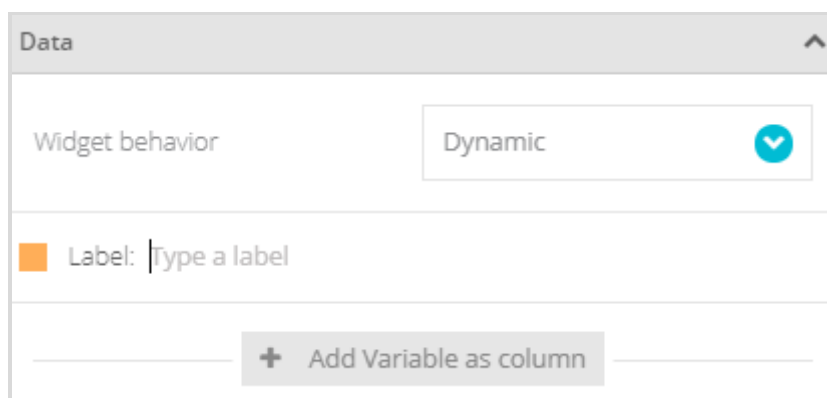
When placed on a dynamic dashboard this option will be visible.



The screenshot shows a configuration panel titled 'Data' with a collapse arrow in the top right. Inside, the 'Widget behavior' is set to 'Dynamic' with a dropdown arrow. At the bottom, there is a button labeled '+ Add Variable as column'.


Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variable As Column a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)



This screenshot shows the same configuration panel as before, but with an additional section below the 'Dynamic' dropdown. It contains a small orange square icon followed by the text 'Label: |Type a label'. The '+ Add Variable as column' button remains at the bottom.

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variable As Column** again to add more variables.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance

Name

Values Table

Decimal points

Auto

Date format

Set by Dashboard

Borders

Horizontal borders

Border width

1

Values per page

10

Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Decimal Points Enter the number of decimal places to show for variable values.

Date Format Select the required date format to be displayed on the widget.


Borders Choose which table borders to display.



All, Inner borders, horizontal, vertical, outer or none.

Border Width Enter the desired border width in pixels.

Values per page Enter how many history values you want to see in the table in each page.

 Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance

Values Table			
DATE	AVERAGE LAST VALUE (MEGATEWAYBOX04 (MOISTURE DEVICE))	GUST LAST VALUE (MEGATEWAYBOX04 (MOISTURE DEVICE))	
May 29 2019 21:42	0.00	0.00	
May 29 2019 21:37	0.00	0.00	
May 29 2019 21:32	0.00	0.00	
May 29 2019 21:27	0.00	0.00	
May 29 2019 21:22	0.04	0.75	
May 29 2019 21:17	0.06	1.12	
May 29 2019 21:12	0.15	1.49	
May 29 2019 21:07	0.05	1.86	
May 29 2019 21:02	0.18	2.24	
May 29 2019 20:56	0.15	2.61	
			◀ ▶

Dashboard Actions

The widget has no specific actions or functionality when displayed on the dashboard.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Variables Table

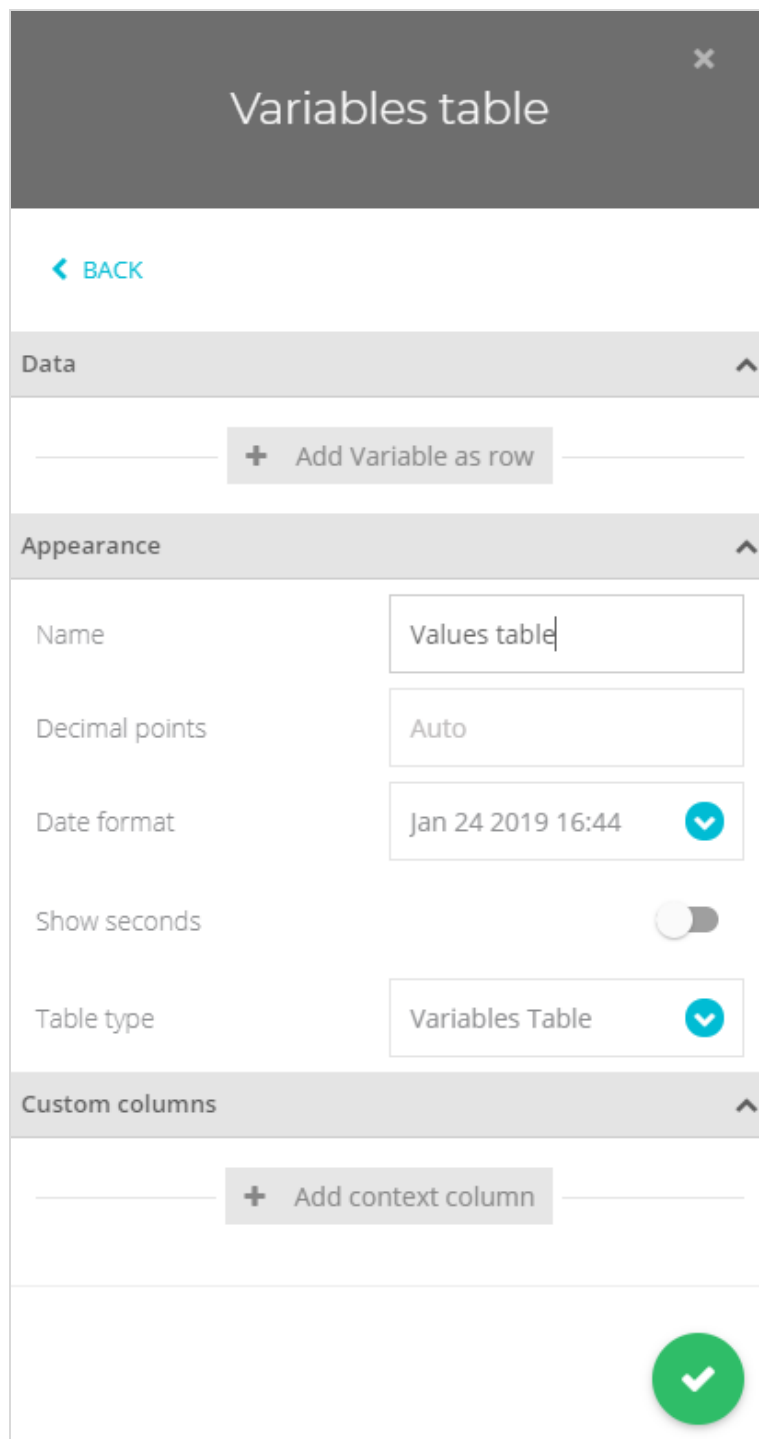
The Variables Table widget shows the last delivered value, aggregated information such as minimum, maximum etc from selected variables across multiple devices in tabular format. You even have control over the colours of displayed data depending on their values.

These are very powerful tables offering easily read lists of data.

Add a Variables Table Widget to display the property panel on the right of the screen.

Property Panel

The property panel has three sections; Data, Appearance and Custom Columns.



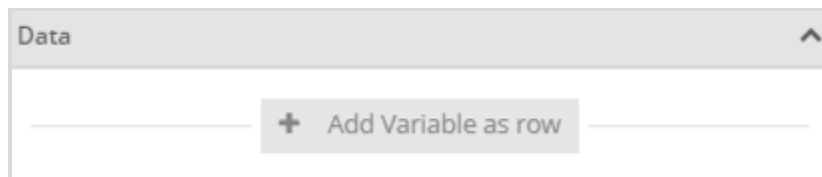
The screenshot shows the 'Variables table' property panel. It has a dark grey header with a close button (X) and the title 'Variables table'. Below the header is a white bar with a blue '< BACK' button. The panel is divided into three main sections: 'Data', 'Appearance', and 'Custom columns', each with a grey header and an expand/collapse arrow. The 'Data' section contains a text input field and a '+ Add Variable as row' button. The 'Appearance' section contains five settings: 'Name' (text input 'Values table'), 'Decimal points' (text input 'Auto'), 'Date format' (text input 'Jan 24 2019 16:44' with a dropdown arrow), 'Show seconds' (toggle switch), and 'Table type' (text input 'Variables Table' with a dropdown arrow). The 'Custom columns' section contains a text input field and a '+ Add context column' button. At the bottom right of the panel is a large green circular button with a white checkmark.

Data Properties

The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

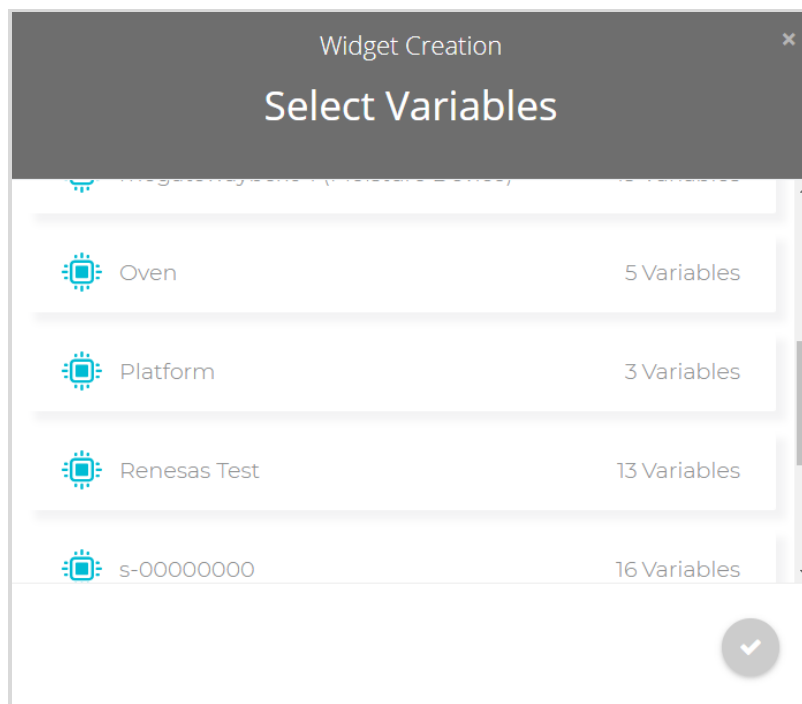
Static Dashboard

When placed on a static dashboard

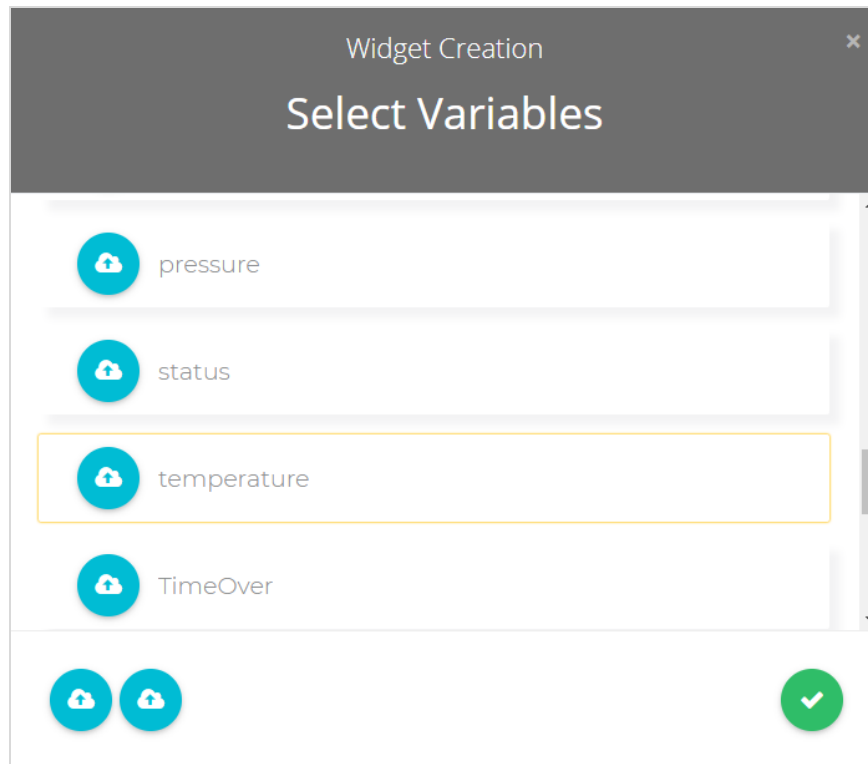



Click Add Variables As Column to add variables to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select multiple variables from multiple devices.

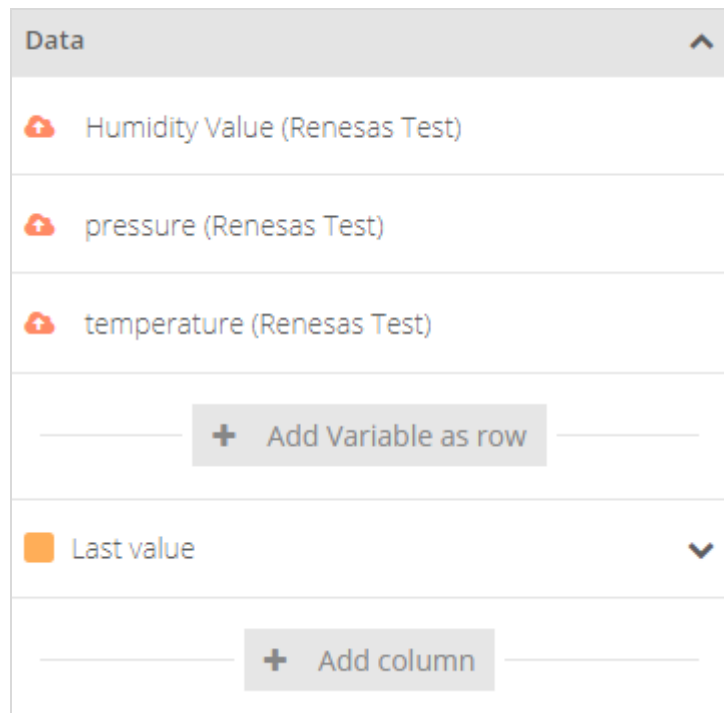
Click on a device to expand the list to show the variables contained in that device.




As you click on a variable to select it a box appears around it and an icon is added to the bottom of the pop-up. You can select multiple variables from a single device or click an additional device to view its variables for selection.



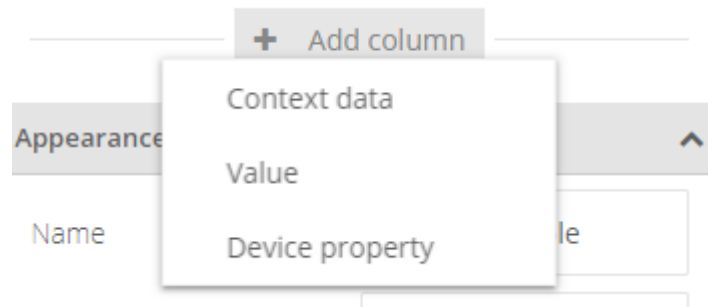
Click the  to close the pop-up to return to the property panel.



You can now see the variables you selected added to the list.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variable As Row** again to add more variables.

You can also see a new Add Column button along with an automatically added column of Last Value. Click the down arrow to the right of the columns to edit the data. Click Add Column to choose more columns to add to the table.



Context Data

Select this then click the down arrow to the right to open the properties for this new column.

This allows you to display textual context data that a variable may hold.

All devices have at least a context named **Status** that holds the error messages from transmitters or other connected data channels.


Column Name Enter the name to appear at the column header.

Context Key Enter the name of the Context. (Example **Status**)

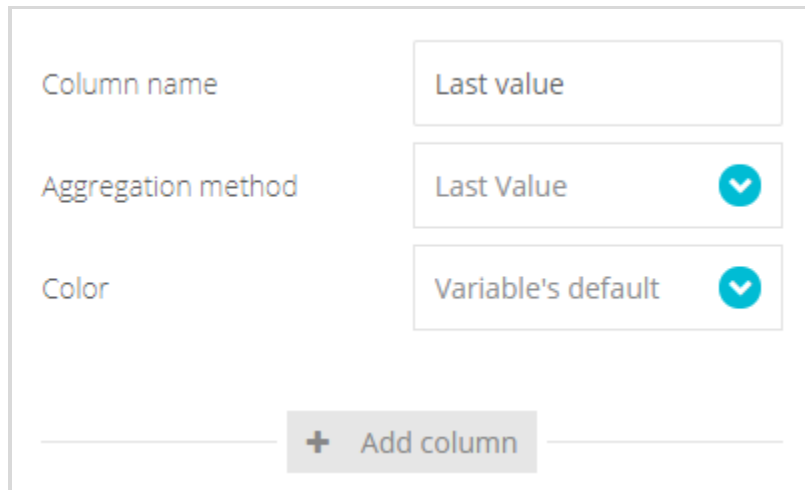
Colour Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.

Colour Logic Only visible when Colour Logic is selected for the Colour option above. Click Add Colour Logic to add to the default set of colours.

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.
 Select a colour by clicking the colour swatch or the colour code field.
 The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

Value



This choice display the numeric value of a variable.

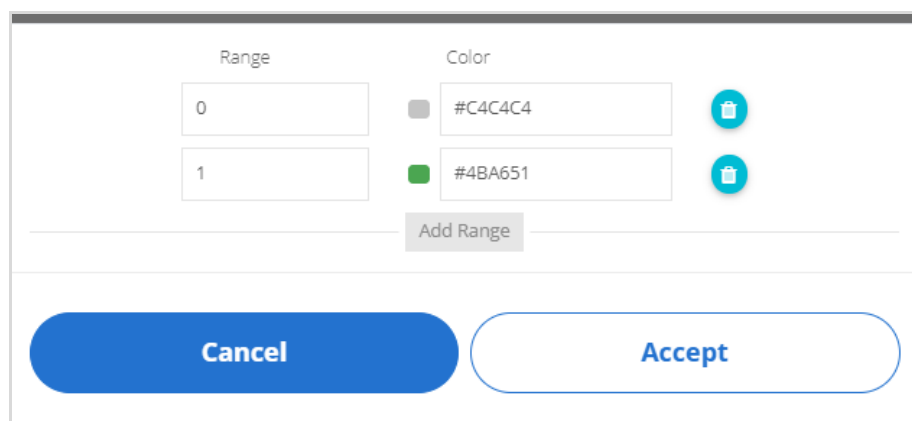
Column Name Enter the name to appear at the column header.


Aggregation Method Choose from a selection of metrics such as Min, Max or average.

Span Only visible when the Aggregation Method is not Last Value. Simply select the time span over which the aggregation takes place. i.e. the Maximum from the Last Hour.

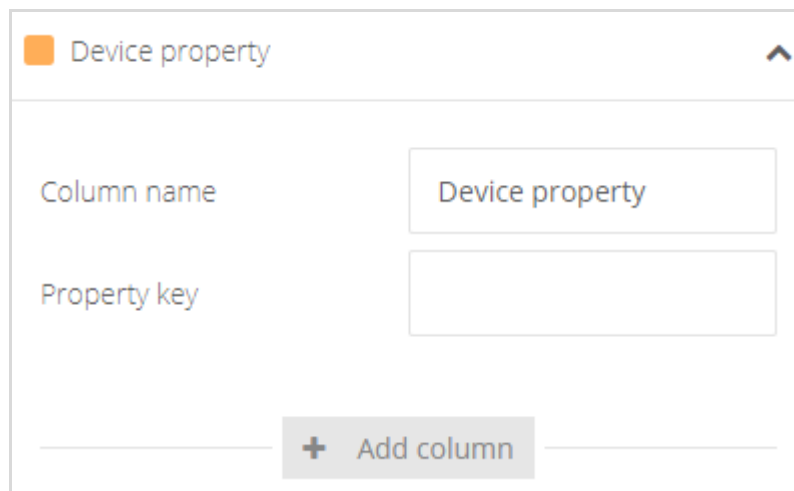
Colour Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.

Colour Logic Only visible when Colour Logic is selected for the Colour option above. Click Add Colour Logic to add to the default set of colours.



Add new ranges by clicking the Add Range button.
 Delete ranges by clicking the delete icon  to the right of a range.
 Select a colour by clicking the colour swatch or the colour code field.
 The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

Device Property



Device property

Column name Device property

Property key

+ Add column

This choice allows you to display a custom property that has been assigned to the parent device of the variable. See [Variable Tile View | Side Panel](#) to find out how to add custom properties to devices.

Column Name Enter the name to appear at the column header.

Property Key Enter the name of the custom Property to display.

When placed on a dynamic dashboard this option will be visible.

Data

Widget behavior

Dynamic

+ Add Variable as row

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variable As Row a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

Data

Widget behavior


Dynamic

Label:

Type a label

+ Add Variable as row

Simply click where it says **Type a Label** and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. You can also click **Add Variable As Row** again to add more variables.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Appearance ^


Name

Variables Table



Decimal points

Auto

Date format

May 30 2019 10:20 


Borders

 Horizontal borders 


Border width

1


Variables per page

10 

Display date column



Display Device column









- Name

Enter the title of the widget to appear at its top left when displayed on the dashboard.
- Decimal Points

Enter the number of decimal places to show for variable values.
- Date Format

Select the required date format to be displayed on the widget.
- Borders



Choose which table borders to display.


All, Inner borders, horizontal, vertical, outer or none.
- Border Width

Enter the desired border width in pixels.
- Devices Per Page

Enter how many devices to view on each page. Pages are navigated by clicking the arrows at the lower right of the widget.

 
- Display Date Column

Choose whether to add another column showing the data when the last data was received.
- Display Device Column

Choose whether to add another column containing the device name.
- 

Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance

Variables Table				
VARIABLE NAME	LAST VALUE	CONTEXT DATA	LAST VALUE	DEVICE PROPERTY
Humidity Value	0.00	---	0.00	12345678
pressure	0.00	---	0.00	12345678
temperature	30.00	---	30.00	12345678
				◀ ▶

Dashboard Actions

Clicking on a variable name will take you to the backend data view for that variable (As long as your user has access rights to this information).

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Devices Table

This widget shows a list of devices along with columns of shared variables and date information.

This widget is very useful when devices share a common set of variables that can then be viewed easily in table format.

When devices are actually gateways collecting values from multiple sensors this is not so useful but can be used to show the last contact date and time for each device.

Add a Devices Table Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

Devices table

← BACK

Data

+ Add Devices as row

Appearance

Name: Devices Table

Decimal points: Auto

Date format: May 28 2019 11:32

Borders: Horizontal borders

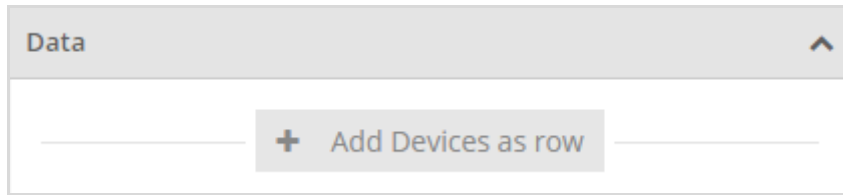
Border width: 1

Devices per page: 10

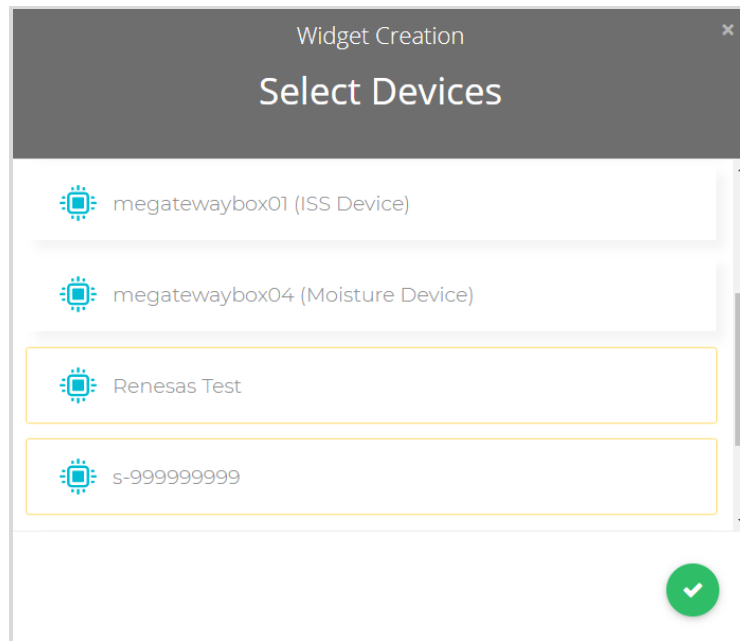
✓


Data Properties

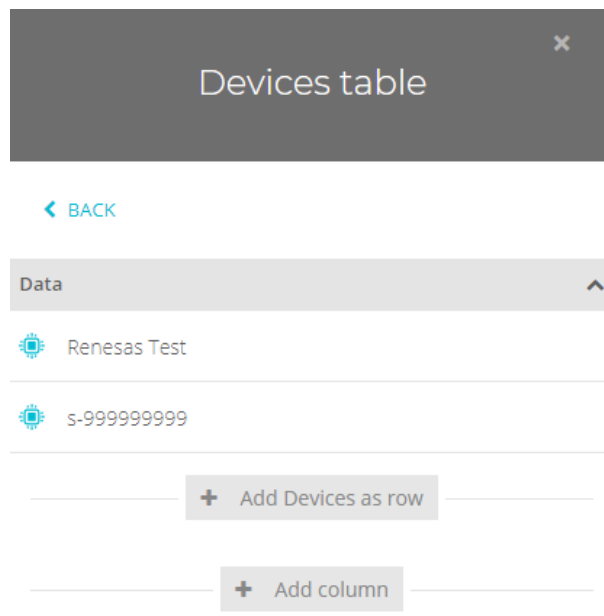
This section will look the same regardless of whether the widget is placed on a static or dynamic dashboard.




Click Add Devices As Row to add devices to the widget. A pop-up will be displayed allowing you to select multiple devices.



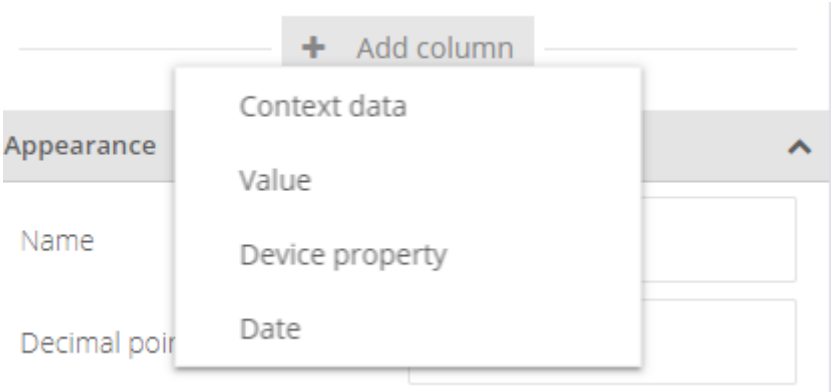
Click the  to close the pop-up to return to the property panel.



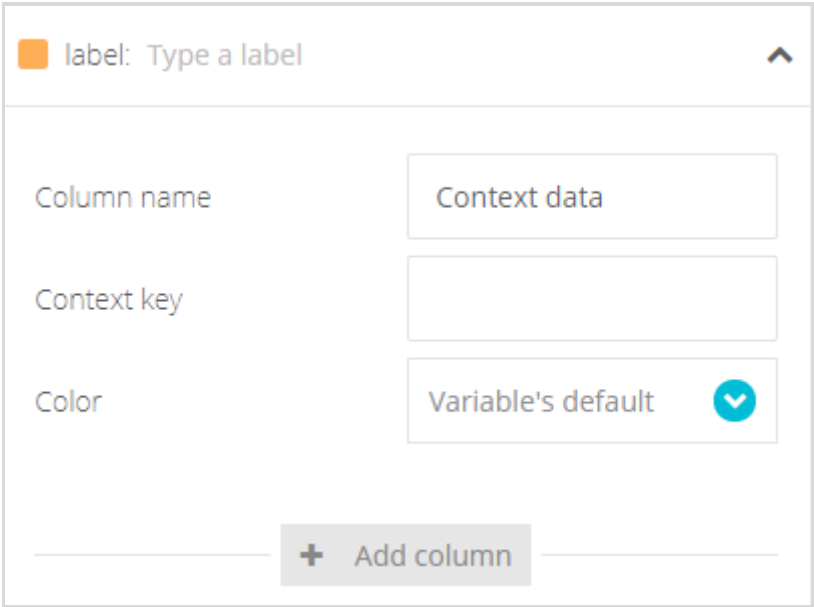
You can now see the devices you selected added to the list.

If you hover over the devices you will see a delete icon  appear so it can be removed from the list. You can also click **Add Devices As Row** again to add more devices.

After the devices have been added you can start to define the columns to display. Click **Add Column** to choose the type of column you want to add.



Context Data

A screenshot of a configuration form for 'Context Data'. It has a header 'label: Type a label' with an orange square icon and an up arrow. The form contains three fields: 'Column name' with the value 'Context data', 'Context key' (empty), and 'Color' with a dropdown menu showing 'Variable's default' and a blue checkmark icon. At the bottom is a '+ Add column' button.

This allows you to display textual context data that a device may hold.
All devices have at least a context named **Status** that holds the error messages from transmitters or other connected data channels.

- | | |
|---------------------|--|
| Label | Enter the name to of the variable that contains the context data. (Example status) |
| Column Name | Enter the name to appear at the column header. |
| Context Key | Enter the name of the Context. (Example Status) |
| Colour | Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below. |
| Colour Logic | Only visible when Colour Logic is selected for the Colour option above.
Click Add Colour Logic to add to the default set of colours. |

Range

0

1

Color

#C4C4C4

#4BA651

Add Range

Cancel

Accept

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

Value

label: Type a label

Column name

Last value

Aggregation method

Last Value

Color

Variable's default

+ Add column

This choice display the numeric value of a variable.

Label Enter the name of the variable whose value you wish to display.

Column Name Enter the name to appear at the column header.

Aggregation Method Choose from a selection of metrics such as Min, Max or average.

Colour Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.

Colour Logic Only visible when Colour Logic is selected for the Colour option above. Click Add Colour Logic to add to the default set of colours.

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

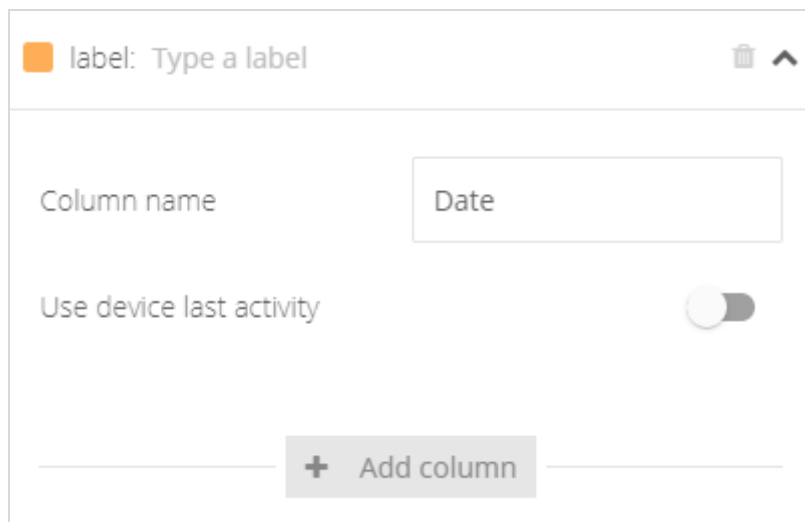
Device Property

This choice allows you to display a custom property that has been assigned to a device. See [Variable Tile View | Side Panel](#) to find out how to add custom properties to devices.

Column Name Enter the name to appear at the column header.

Property Key Enter the name of the custom Property to display.

Date



This allows a date to be displayed which can either be the date that a variable has last been updated or the date that the device has last communicated with SensorSpace.

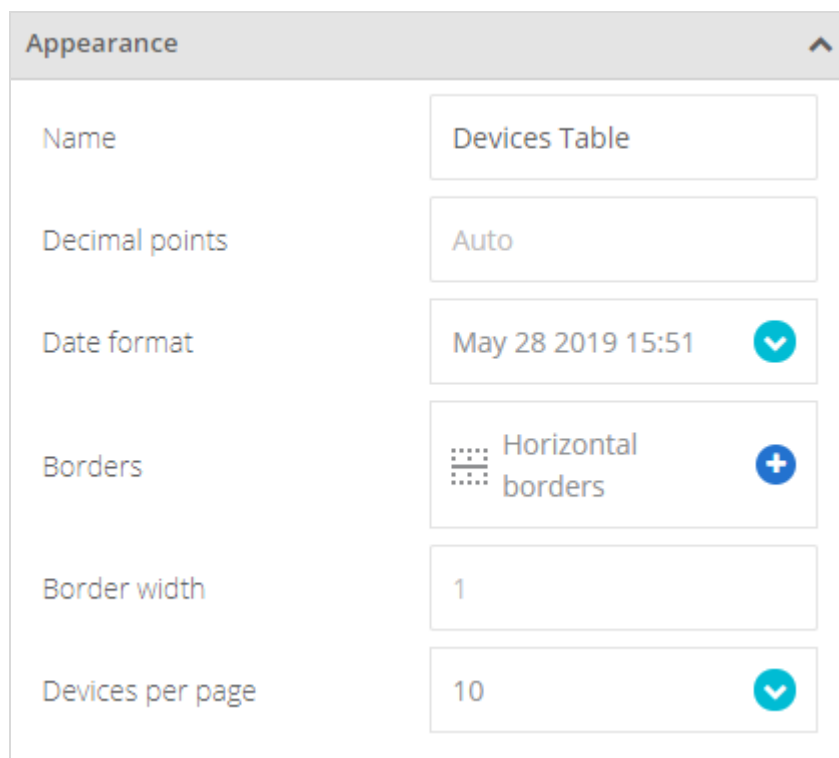
Label Enter the name of the variable.

Column Name Enter the name to appear at the column header.

Use Device Last Activity Select this to display the data that the device last contacted SensorSpace.
If left unselected then the date the specific variable was last delivered will be displayed.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.



Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Decimal Points Enter the number of decimal places to show for variable values.

Date Format Select the required date format to be displayed on the widget.

Borders Choose which table borders to display.



All, Inner borders, horizontal, vertical, outer or none.

Border Width Enter the desired border width in pixels.

Devices Per Page Enter how many devices to view on each page. Pages are navigated by clicking the arrows at the lower right of the widget.



Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance

Devices Table						
DEVICE NAME	CONTEXT DATA	LAST VALUE	DEVICE PROPERTY	DATE	DATE LAST	
megatewaybox01 (ISS Device)	Offline	100.00	---	May 22 2018 09:43	May 30 2019 07:36	
megatewaybox04 (Moisture Device)	OK	0.00	---	May 30 2019 08:02	May 30 2019 08:24	
h-1234567890 (Sonoff)	---	---	---	---	Apr 05 2019 12:37	
Renasas Test	Remote Timeout:FFFF	62.00	12345678	May 30 2019 08:18	May 30 2019 08:27	
s-999999999	---	---	1234567890	---	May 22 2019 16:56	
						◀ ▶

Dashboard Actions

If you are logged with a user that is allowed to view device data and variables then clicking on a device name in the table will take you to the [Variables Tile View](#) for that device.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Image

The Image Widget simply displays an image which can be sourced from a URL or uploaded from your computer. The image will be automatically resized to fit the widget whilst retaining the original image aspect ratio where possible.

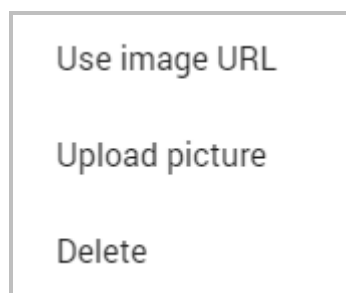
Property Panel

The property panel only has two sections; Data and Appearance.
This widget behaves the same whether the dashboard is static or dynamic.

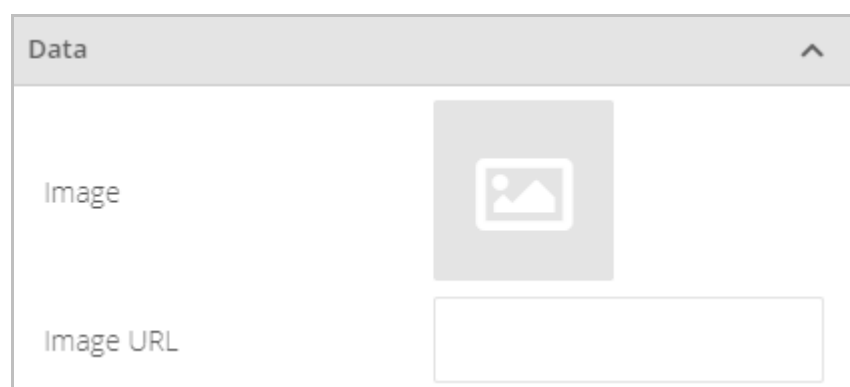
Data Properties



Click on the image to open the options menu.



Use Image URL Selecting this option will display a field to allow the URL of the image to be entered.



Upload Picture A Windows file dialog box will be displayed to allow you to locate a picture from your computer to upload.
Image formats supported are: GIF, PNG, JPEG/JPG and BMP. Animated GIFs are also supported. GIF transparency is also supported.

Delete Delete existing picture.

Appearance Properties

This widget behaves the same whether the dashboard is static or dynamic.

Appearance

Name

Image

Alignment

Center


Image width

100

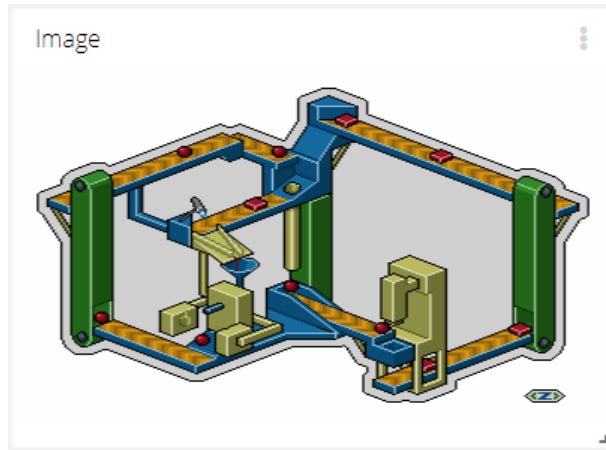
%

Background color

#ffffff

Name	Enter the title of the widget to appear at its top left when displayed on the dashboard.
Alignment	Select one of the available fonts.
Image Width	Click the coloured square or colour code to open the colour selection pop-up. See Colour Selection
Background Colour	Enter the text to appear inside the widget.
	Click to close the properties panel and place the widget onto the dashboard.

Dashboard Appearance



When viewed on the dashboard the Image widget simply displays the specified image.

Dashboard Actions

The widget has no specific actions or functionality when displayed on the dashboard.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

Manual Input

Very often dashboards not only act as a monitoring tool, but also as an actual UI where users interact with your IoT solution. Part of that interaction involves manually entering data based on operational events, set points at the device level, modification of calculation parameters or simply leave a comment about a specific behavior. For such cases, the Manual Input widget exists.

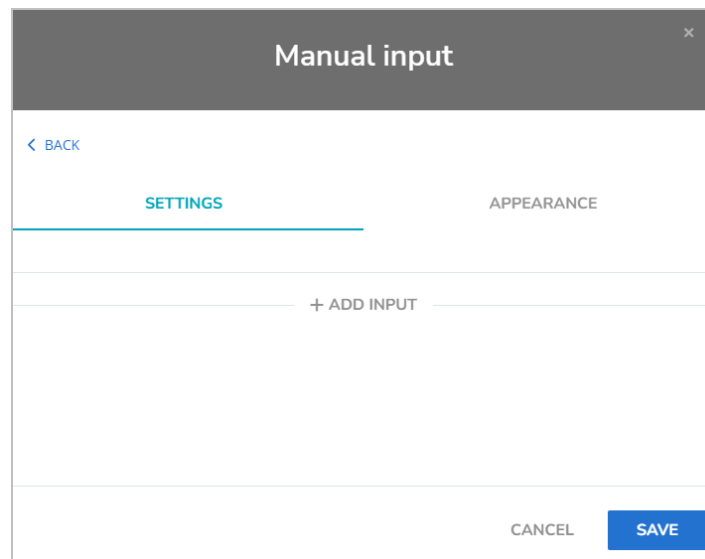
Note that this widget can contain multiple rows of entry fields.

Property Panel

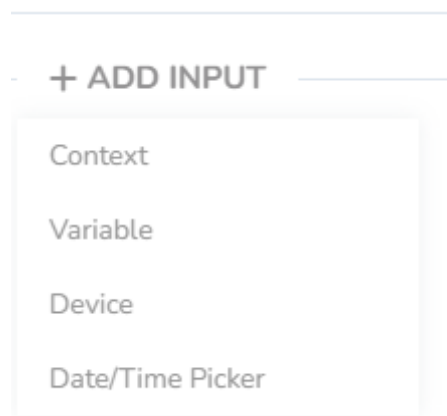
The property panel only has two sections: Settings and Appearance.

Settings Properties

This is where you can select the variable that the manual input will be applied to.



Click **Add Input** to display a menu of options:



Multiple input rows can be added consisting of the above options, simply click Add Input again.

Context

This allows full text to be applied to the context of a variable. Context is essentially a string variable that can be associated with a value written to a variable and can be displayed in other widgets.

Note: if this same Manual Input widget does not include another row for this variables value then the value will be written as zero when the context is written.

As soon as you select this option a dialog will appear allowing you to select a device and a variable. The following options will then be displayed in the properties bar.

The screenshot shows the properties bar for a widget titled 'TestVariable (Fixed_Demo)'. It contains three rows: 'Variable' with a dropdown menu showing 'TestVariable (Fixed_Demo)' and a '+' button; 'Input name' with a text field containing 'Context data'; and 'Context key' with an empty text field.

Where:

Variable – Indicates the selected variable and device. Click the + button to change to another.

Input Name – The label to be displayed above the input field.

Context Key – The string name of the context to apply the entered text value against.

Variable

This allows a numeric value to be written to a specific device variable. Adding a Context (Above) row will allow a context string to be added along with the value and adding a Date/Time Picker row will allow the time stamp of the value to be set.

As soon as you select this option a dialog will appear allowing you to select a device and a variable. The following options will then be displayed in the properties bar.

The screenshot shows the properties bar for a widget titled 'TestVariable (Fixed_Demo) Last value'. It contains four rows: 'Variable' with a dropdown menu showing 'TestVariable (Fixed_Demo)' and a '+' button; 'Input name' with a text field containing 'TestVariable' and a small icon; 'Range' with two text fields containing '0' and '100'; and 'Step' with a text field containing '1'.

Where:

Variable – Indicates the selected variable and device. Click the + button to change to another.

Input Name – The label to be displayed above the input field.

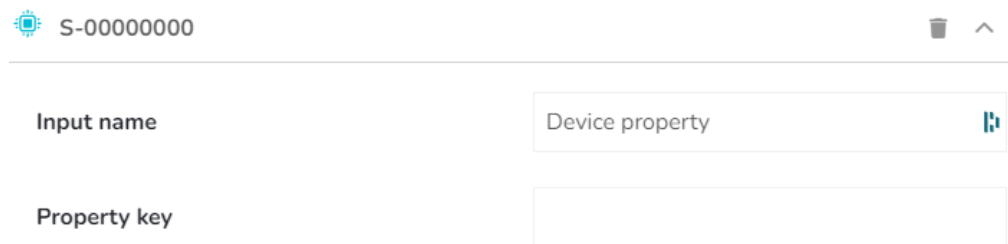
Range – Enter the numeric range of the acceptable input values.

Step – Enter the step value that will be accepted. For example; a value of 5 will only accept 5, 10, 15 etc

Device

This allows a new Property to be added or an existing property to be updated. This may only be useful when you manually inspect the device properties or are using the API.

As soon as you select this option a dialog will appear allowing you to select a device. The following options will then be displayed in the properties bar.



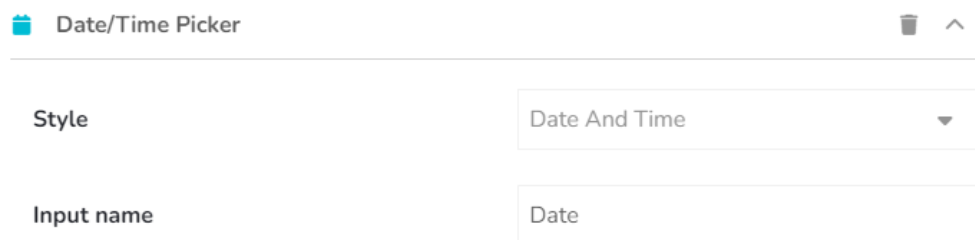
Where:

Input Name – The label to be displayed above the input field.

Property Key – Enter the property key name against which the entered text will be assigned.

Date/Time Picker

This allows a specific date and time to be applied to the variable data point written by this widget. Requires a Variable to be included from the menu as well.



Where:

Style – Choose from Date and Time or Date Only

Input Name – The label to be displayed above the input field.

Appearance Properties

This widget behaves the same whether the dashboard is static or dynamic.

Manual input

< BACK

SETTINGS

APPEARANCE

Name

Manual input

Button label

Send

Font

Open Sans

CANCEL

SAVE

- Name

Enter the title of the widget to appear at its top left when displayed on the dashboard.
- Button Label

Enter the text to appear on the submit button.
- Font

Select one of the available fonts.
- SAVE

Click to close the properties panel and place the widget onto the dashboard. Or click Cancel to lose changes.

Dashboard Appearance

Manual input

Context data

TestVariable

Device property (s-00000000)

Date

Send

When viewed on the dashboard the Text widget simply displays the specified text.

Dashboard Actions

The widget then accepts you manual data entry and submits it when the Send (Or custom labelled) button is clicked.

Use the menu at the top right of the widget to perform actions such as Share, Edit and Delete. See [Widget Menu Items](#)

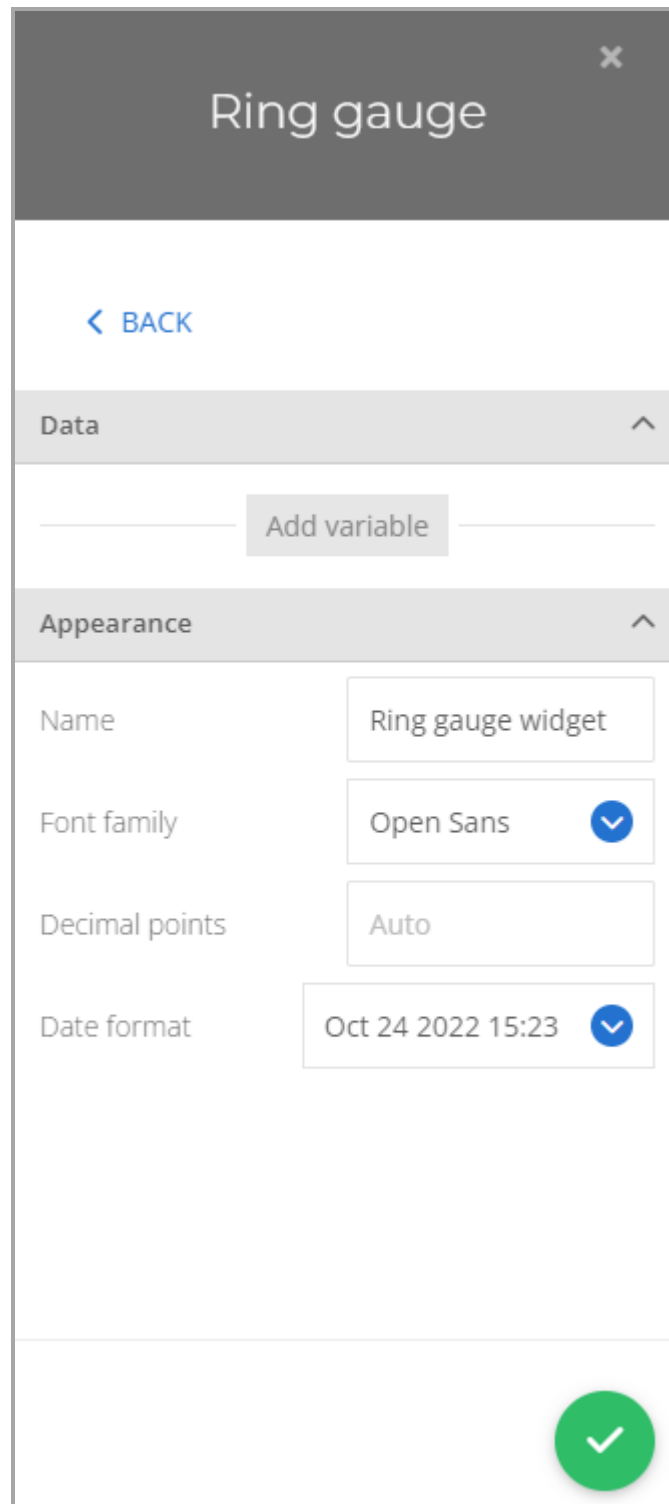
Ring Gauge

The Ring gauge widget allows you to visualize the state of up to 4 variables at the same time, graphically compare them to one another, or show how close the variables are to their corresponding limits.

Add a Ring Gauge Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two sections; Data and Appearance.

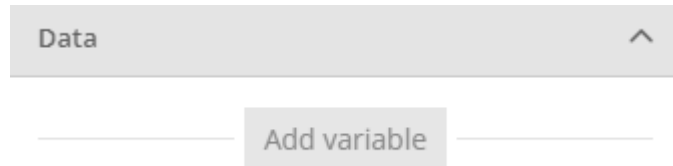


The screenshot shows a mobile application interface for configuring a 'Ring gauge' widget. At the top is a dark grey header with the title 'Ring gauge' and a close button (X). Below the header is a white area with a blue '< BACK' button. The main content is divided into two sections: 'Data' and 'Appearance', each with a grey header and an expand/collapse arrow. The 'Data' section contains a text input field and an 'Add variable' button. The 'Appearance' section contains four rows of settings: 'Name' with a text input 'Ring gauge widget'; 'Font family' with a dropdown menu showing 'Open Sans'; 'Decimal points' with a text input 'Auto'; and 'Date format' with a dropdown menu showing 'Oct 24 2022 15:23'. A large green circular button with a white checkmark is located at the bottom right of the panel.

Data Properties

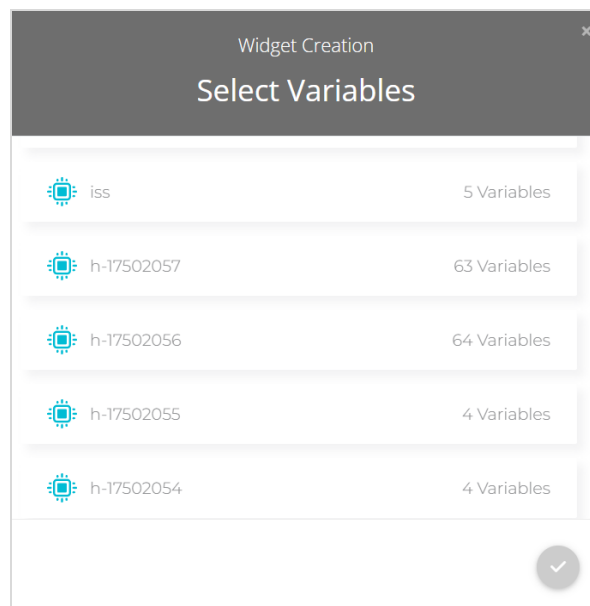
The Data section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

When placed on a static dashboard

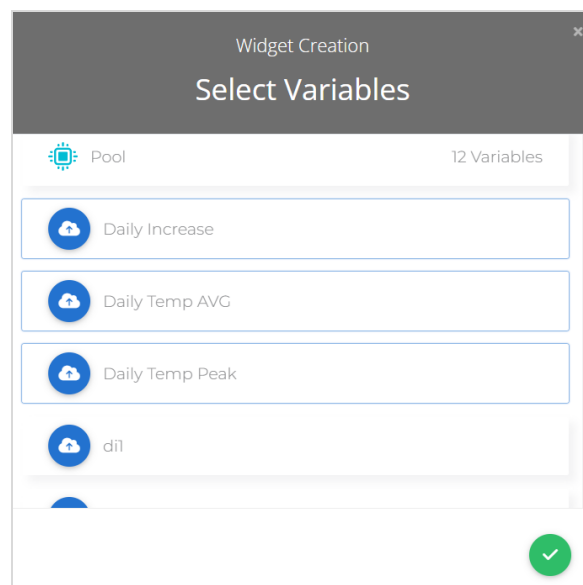


Click Add Variable to add up to four variables to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select a single variable from any single device.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to select it a box appears around it. Select up to four variables. These can be from different devices.



Click the  to close the pop-up to return to the property panel.

Data

Daily Temp AVG
(Pool)

Aggregation methodLast value


SpanSet by dashboard

Range value0100

ColorVariable's default

Daily Temp Peak
(Pool)

You can now see the variables you selected added to the Data section.

If you hover over the variable you will see a delete icon  appear so it can be removed from the panel. To change the colour of the display for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#)

Aggregation Method

Select how the data points from the variable will be displayed. You can choose from Average, Count, Maximum, Minimum, Raw and Sum. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

<i>Aggregation Method</i>	<i>Secondary Time Setting</i>	<i>Description</i>
<i>Average</i>	Span	Display each point on the chart as an average of all data received over the specified Span. The span can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar. i.e. if the sample period is set to 5 minutes and the dashboard time span was set to Last Hour then the chart will show 12 data points where each plotted point represents the average of all the data received for the variable for that 5 minute period.
<i>Minimum</i>	Span	Display each point on the chart as the minimum value of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Maximum</i>	Span	Display each point on the chart as the maximum value of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Sum</i>	Span	Display each point on the chart as the sum of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Count</i>	Span	Display each point on the chart as a total count of the number of values received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Last Value</i>	Span	Display all the data points for either Last Values where you enter the number of data points to display, or Set By The Dashboard so the dashboard setting determines the timespan of the X axis.

Span

Select 'Set by dashboard' to use the time span selected for the dashboard or select a custom time and date range from the pop up dialog box.
The widget will use data from the specified variables over this time span to generate the plots on each axis.

Range Value

Enter the min and max values for the variable to display either an empty segment or a full segment.

Colour





Choose either Set by Widget, Variables Default (The colour selected against the variable name in the Data section) or choose Colour Logic to define colours based on the displayed value. When this is selected another choice will appear as described below.

Colour Logic

Only visible when Colour Logic is selected for the Colour option above.
Click Add Colour Logic to add to the default set of colours.

Select color logic

Metric widget

Range	Color
0	 #C4C4C4 
1	 #4BA651 

Add Range

Cancel Accept

Add new ranges by clicking the Add Range button.

Delete ranges by clicking the delete icon  to the right of a range.

Select a colour by clicking the colour swatch or the colour code field.

The Range value states from which value the colour will be displayed. The default settings will result in grey text when the variable value is less than 1 but green text when the variable value is 1 or greater.

When placed on a dynamic dashboard this option will be visible.

The screenshot shows a configuration panel titled 'Data'. It has a 'Widget behavior' dropdown menu set to 'Dynamic'. Below this is a button labeled '+ Add Variables'.


Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variable a new variable row will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

The screenshot shows a more detailed configuration panel titled 'Data'. It includes the following settings:

- Widget behavior:** Set to 'Dynamic'.
- Label:** A section with an orange square icon and the text 'Label: Type a label'.
- Aggregation method:** Set to 'Last value'.
- Span:** Set to 'Set by dashboard'.
- Range value:** Two input fields with values '0' and '100'.
- Color:** Set to 'Variable's default'.
- Add variable:** A button at the bottom.

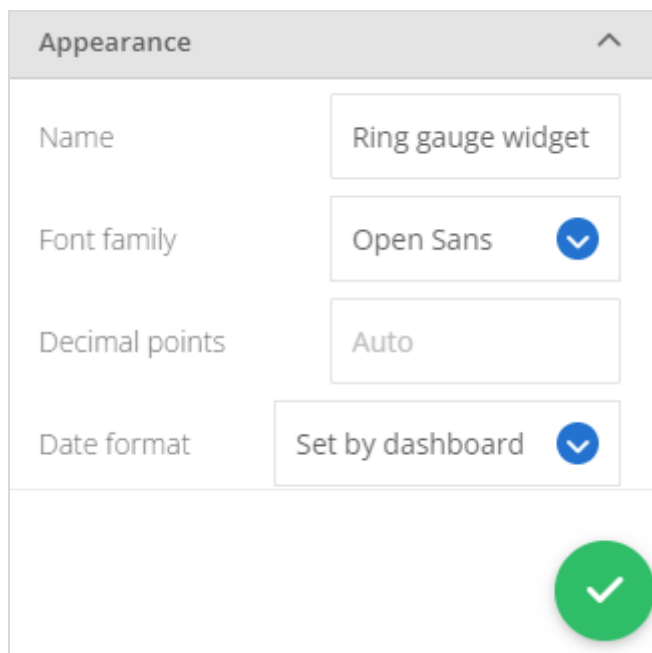
Simply click where it says Type a Label and enter the label name.

If you hover over the variable you will see a delete icon  appear so it can be removed from the list. To change the colour of the plot for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).


See the [Static Dashboard](#) section for the description of the other settings.

Appearance Properties

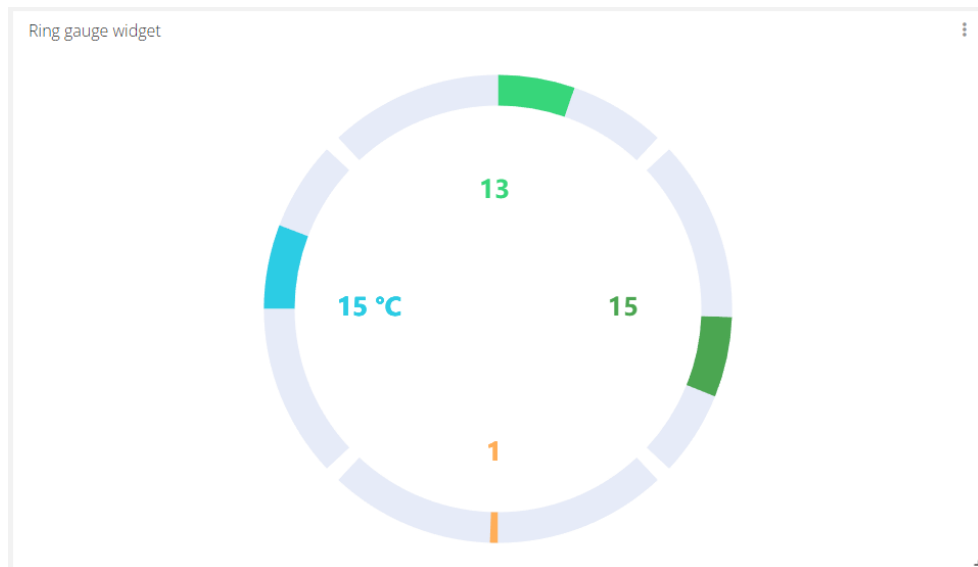
This section is the same regardless of whether the widget is static or dynamic.



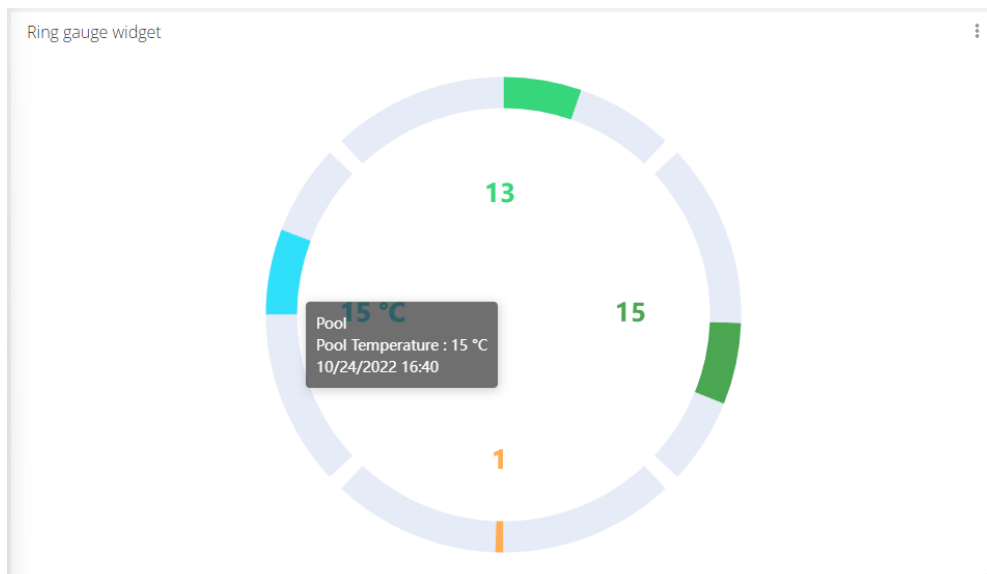
The screenshot shows a properties panel titled "Appearance" with a close button (upward arrow) in the top right corner. It contains four configuration rows: "Name" with a text input field containing "Ring gauge widget"; "Font family" with a dropdown menu showing "Open Sans" and a blue downward arrow; "Decimal points" with a text input field containing "Auto"; and "Date format" with a dropdown menu showing "Set by dashboard" and a blue downward arrow. At the bottom right of the panel is a large green circular button with a white checkmark.

- | | |
|---|---|
| Name | Enter the title of the widget to appear at its top left when displayed on the dashboard. |
| Font family | Select one of the available fonts. |
| Decimal Points | Enter the number of decimal places to show for variable values in the information bar when the mouse is hovered over the chart. |
| Date Format | Select the required data format to be displayed on the widget. |
|  | Click to close the properties panel and place the widget onto the dashboard. |

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the ring gauge displays a panel showing the name of the device, the name of the variable and its value along with the date and time the variable value was received.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

Heat Map Table

A Heatmap table is a two-dimensional graphical representation of data in which values are displayed or represented by colors.

When having a large volume of data, it is important to visualize and focus on the most relevant values accordingly to your needs. The Heatmap table Widget allows you to simplify complex data into visualizations that can be easily understood and identified.

The X axis will always show the 24 hours of an entire day but you can select whether the Y axis shows days of the week, days of the month or months.

Add a Heat Map Table Widget to display the property panel on the right of the screen.

Property Panel

The property panel has two tabs; Settings and Appearance.

Heatmap Table

BACK

SETTINGS

APPEARANCE

Widget behavior

Dynamic

Y-Axis

Days Of The Week

+ Add variable

CANCEL

SAVE

Settings Properties

The Settings section will show different content depending on whether the widget has been placed onto a static or dynamic dashboard.

Static Dashboard

When placed on a static dashboard

SETTINGS

APPEARANCE

Y-Axis

Days Of The Week

+ Add variable

Y-Axis

This allows you to select how the selected span of data is presented in the table. The choices are:

Days Of the Week – Show data viewed hourly in a block of each day of the week.

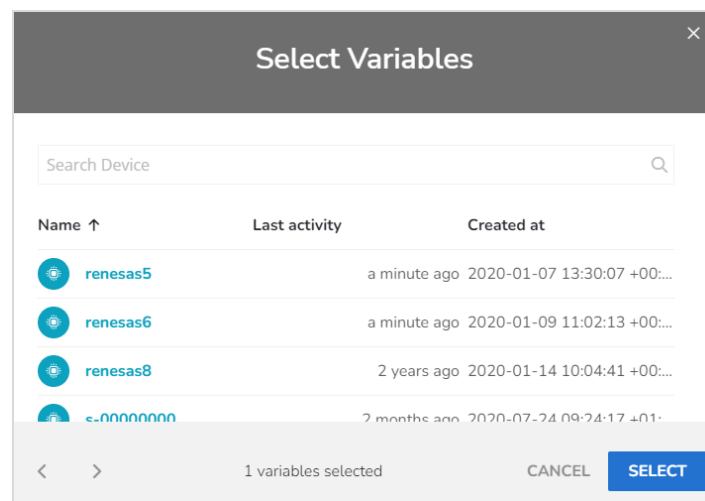
Days of The Month – Show data viewed hourly over every day in a month.

Months – Show data viewed hourly over each month.

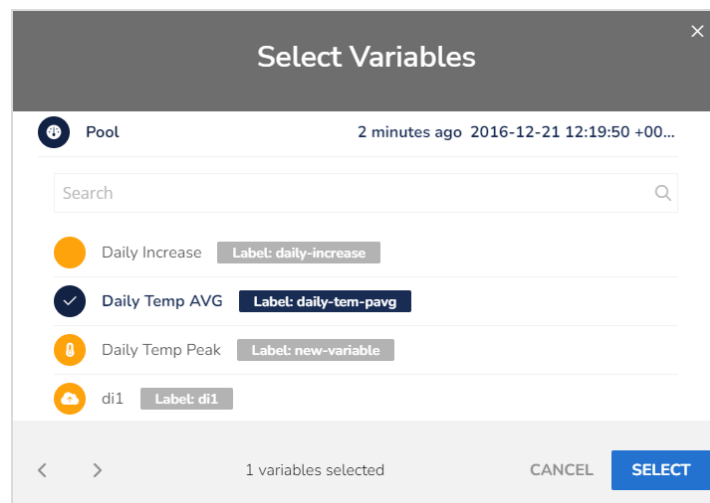
This sets the viewport into your data. Remember that you may be looking at more data than the Y-Axis setting. i.e. you could view 6 months worth of data but presented hourly over a week so, depending on the Span settings selected for the variable, you could be seeing the average temperature over 6 months visualised hourly over the days of the week.

Click Add Variable to add a single variable to the widget. Because this is a static widget you will be selecting specific variables from specific devices. A pop-up will be displayed allowing you to select a single variable from any single device.

Click on a device to expand the list to show the variables contained in that device.



As you click on a variable to highlight it.



Click the **SELECT** button to close the pop-up to return to the property panel.

Daily Temp AVG Pool

Aggregation method

Last Value

Span

Set by dashboard


Color

Color logic

CANCEL

SAVE

You can now see the variables you selected added to the Data section.

There will be a delete icon  to the right of the variable name so it can be removed from the panel.

Aggregation Method Select how the data points from the variable will be displayed. You can choose from Average, Count, Maximum, Minimum, Raw and Sum. Below is the list of Aggregation Methods, their description and the associated secondary time setting.

Aggregation Method	Secondary Time Setting	Description
Average	Span	Display each point on the chart as an average of all data received over the specified Span. The span can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar. i.e. if the sample period is set to 5 minutes and the dashboard time span was set to Last Hour then the chart will show 12 data points where each plotted point represents the average of all the data received for the variable for that 5 minute period.
Minimum	Span	Display each point on the chart as the minimum value of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
Maximum	Span	Display each point on the chart as the maximum value of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
Sum	Span	Display each point on the chart as the sum of all data received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.

<i>Count</i>	Span	Display each point on the chart as a total count of the number of values received over the specified Span. The sample period can be 1 day, 6 hours, 1 hour, 30 minutes or 5 minutes. The chart will show data over the time span selected in the dashboard's settings bar.
<i>Last Value</i>	Span	Display all the data points for either Last Values where you enter the number of data points to display, or Set By The Dashboard so the dashboard setting determines the timespan of the X axis.

Span


Select 'Set by dashboard' to use the time span selected for the dashboard or select a custom time and date range from the pop up dialog box.
The widget will use data from the specified variables over this time span to generate the plots on each axis.

Colour Logic

Click the pencil icon to add or edit the set of colours.

You can select either Color Logic or Linear Gradient from the Color Mode drop-down list.

Color Logic

Add new ranges by clicking the Add Range button.
Enter a value range for each colour.
Select a colour by clicking the colour swatch or the colour code field.
Delete ranges by clicking the delete icon  to the right of a range.

Linear Gradient

Values Range

Enter the range of values that will be represented by this gradient.

Initial

Select a colour for values at the minimum end of the range to be displayed as. You can also adjust the opacity of the displayed cell using the percentage adjuster.

Intermediate

Select a colour for values at the centre of the range to be displayed as. You can also adjust the opacity of the displayed cell using the percentage adjuster.

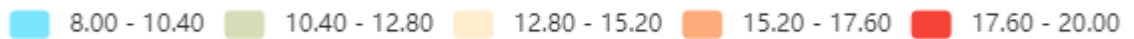
Final

Select a colour for values at the maximum end of the range to be displayed as. You can also adjust the opacity of the displayed cell using the percentage adjuster.

Legend

Choose to either display the value legend in respect of the number of bins (How many different colour slots the entire value range is divided into) or a continuous value key.

Bins



Continuous



Both of these legends will highlight matching cells in the table as the mouse pointer hovers over them.

Bins


How many different colour slots the entire value range is divided into

When placed on a dynamic dashboard this option will be visible.

Widget Behaviour

This allows you to select either Dynamic or Static options for the widget. If you select Static then the variable selection is exactly the same as in the above section for a Static Dashboard. However, if you select Dynamic then, when you click Add Variable a new variable line will appear but rather than selecting a specific device and variable you simply enter the variable label name. (Then, later when different devices are selected in the dashboard's settings bar, the widget will use the matching named variable labels from the selected device.)

Simply click where it says Type a Variable Label and enter the label name.

To the right of the variable row you will see a delete icon  so it can be removed from the list. To change the colour of the plot for the variable just click on the coloured square to the left to open the colour selection pop-up. See [Colour Selection](#).

See the [Static Dashboard](#) section for the description of the other settings.

Appearance Properties

This section is the same regardless of whether the widget is static or dynamic.

Heatmap table

×

Heatmap Table

SETTINGS

APPEARANCE

Name

Heatmap table

Date format

Set By Dashboard

▼

Hour format

24 Hours

▼

Decimal places

Show legend

☒

Hide values

☐

Custom style

Add style

+

CANCEL

SAVE

Name Enter the title of the widget to appear at its top left when displayed on the dashboard.

Date Format Select the required data format to be displayed on the widget.

Hour Format Select whether to show hours in 12 (am + pm) or 24 hour format.

Decimal Places Select how many decimal places will be shown when displaying values in cells.

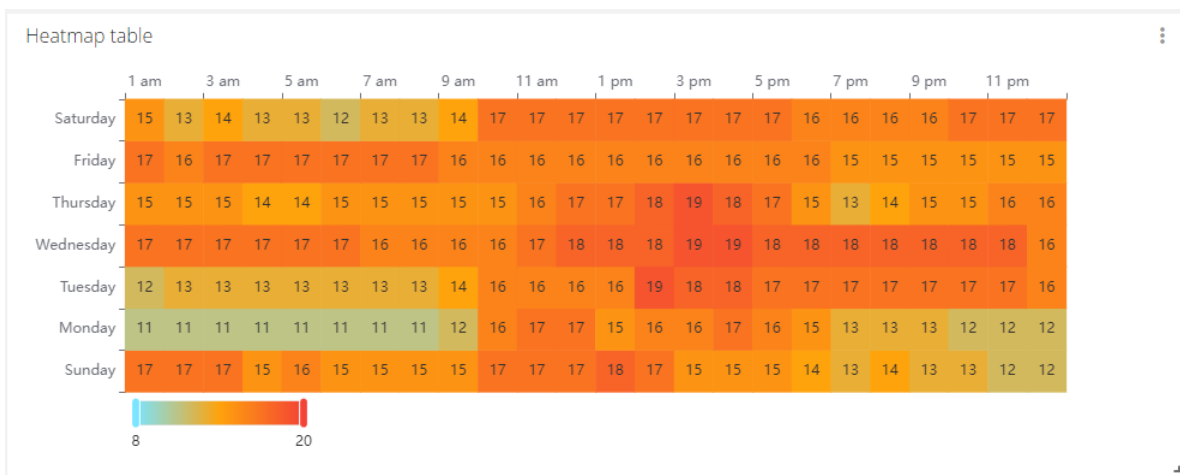
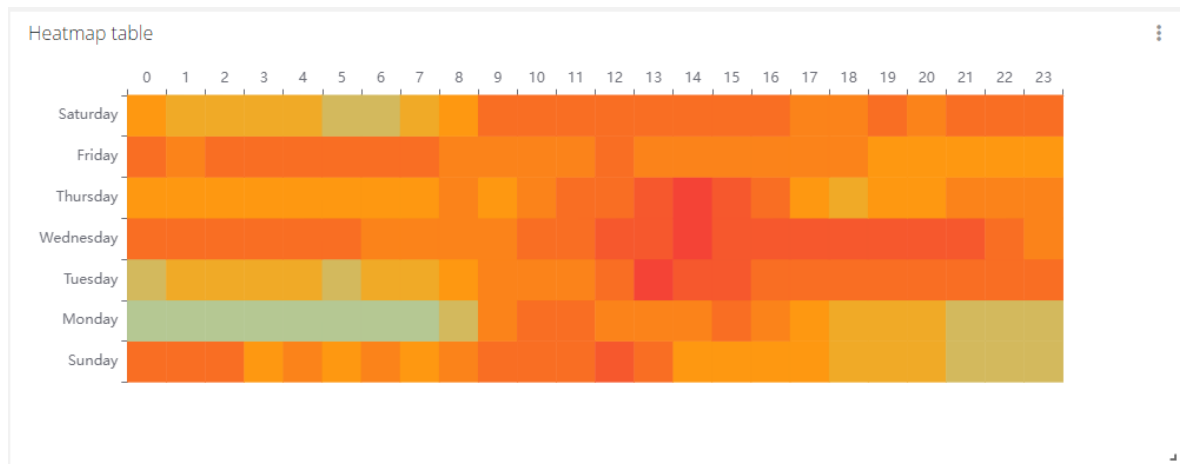
Show Legend Select whether to display the legend under the chart.

Hide Values Select whether to display the values in the cells or not.

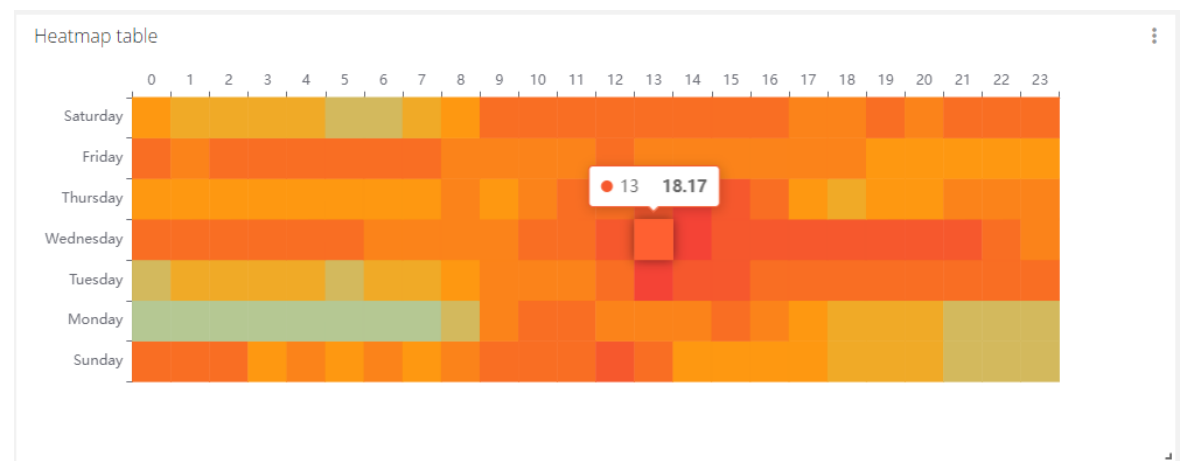
SAVE

Click to close the properties panel and place the widget onto the dashboard or click the CANCEL button to abort changes.

Dashboard Appearance



Dashboard Actions



Hovering the mouse pointer over the chart displays a panel showing the hour and the numeric value of that point.

Use the menu at the top right of the widget to perform actions such as Download, Share, Edit and Delete. See [Widget Menu Items](#)

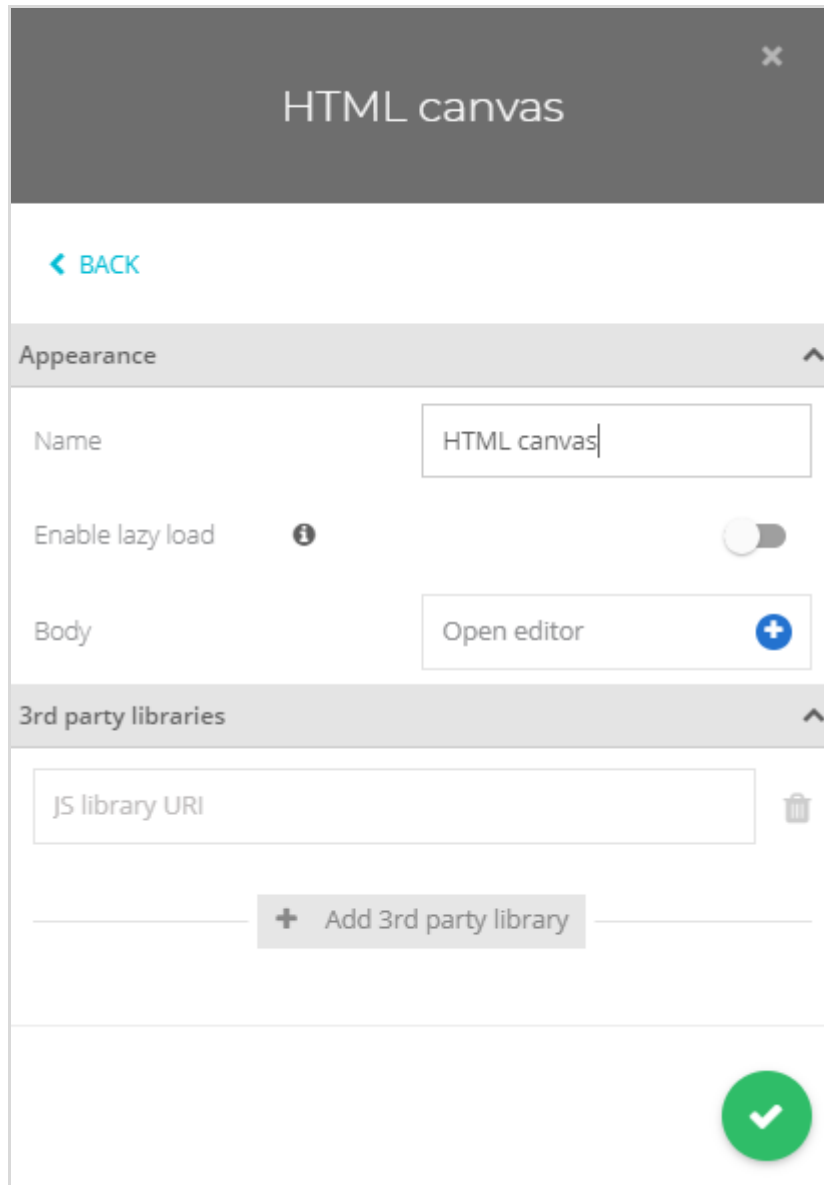
HTML Canvas

The HTML Canvas is considered advanced and the user should have knowledge of HTML, CSS and Javascript to fully appreciate all it offers. Because this section will not be relevant to most users it is located in a separate SensorSpace Cloud Platform Technical Manual which can be requested from your vendor.

Add an HTML Canvas Widget to display the property panel on the right of the screen.

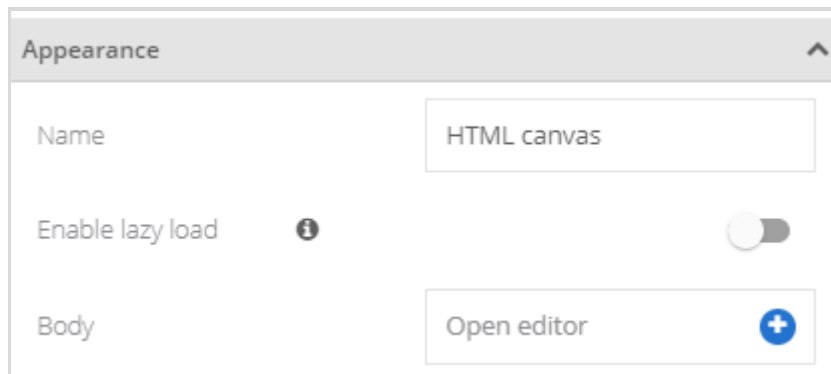
Property Panel


The property panel has two sections; Appearance and 3rd party Libraries.



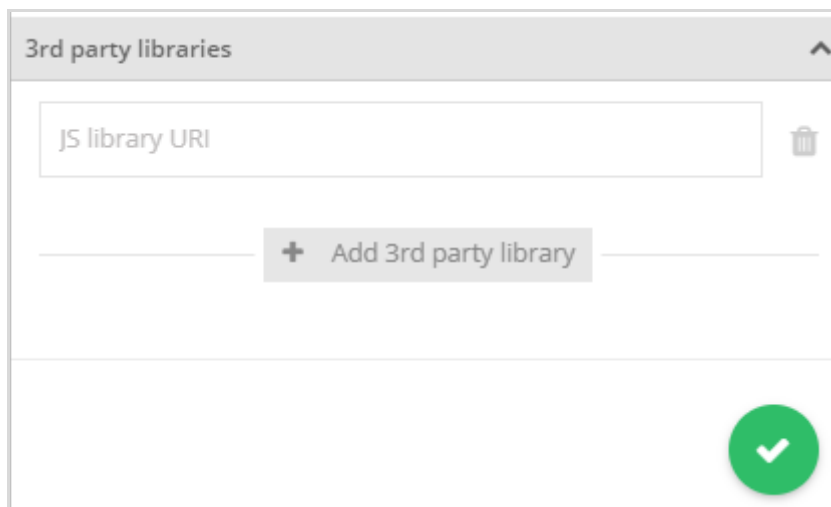
The screenshot shows a mobile application interface for configuring an 'HTML canvas' widget. At the top is a dark grey header with the text 'HTML canvas' and a close button (X). Below the header is a white bar with a blue back arrow and the text '< BACK'. The main content area is divided into two sections. The first section, 'Appearance', has a grey header with an upward arrow. It contains three items: 'Name' with a text input field containing 'HTML canvas'; 'Enable lazy load' with an information icon (i) and a toggle switch; and 'Body' with a text input field containing 'Open editor' and a blue plus icon (+). The second section, '3rd party libraries', also has a grey header with an upward arrow. It contains a text input field for 'JS library URI' with a trash icon (X) to its right. Below this is a button with a plus icon (+) and the text 'Add 3rd party library'. At the bottom right of the screen is a large green circular button with a white checkmark (✓).

Appearance Properties



- Name** Enter the title of the widget to appear at its top left when displayed on the dashboard.
- Enable lazy Load** Enable this option if you need your code to run before the browser renders the dashboard on the screen.
- Body** Click Open Editor to launch the HTML, CSS and Javascript editor. See SensorSpace Cloud Platform Technical Manual.
-  Click to close the properties panel and place the widget onto the dashboard.

3rd Party Libraries Properties



This section in the property bar is for importing 3rd party libraries. Type the URL into the text box and click Add 3rd Party Library to add another.

Dashboard Appearance

How the widget looks will depend on your HTML, CSS and Javascript.


Dashboard Actions

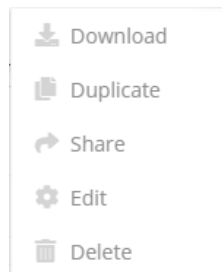
How the widget acts will depend on your HTML, CSS and Javascript.

Common Widget Features

Moving, resizing and renaming widgets is a permanent act and your changes will be automatically saved.

Widget Menu Items

Once widgets have been placed on the dashboard (and assuming the dashboard is not locked and your user has access rights) clicking the  at the top right of the widget will open the widget menu



Download – Allows you to download the data shown in the widget. The data is downloaded by clicking a link in an email that is sent from this dialog box. Emails can be sent to multiple recipients.

A dialog box titled "Download data" with a close button (X) in the top right corner. Below the title is the word "Chart". The form has three input fields: "From:" with the value "2019-11-21", "To:" with the value "2019-11-21", and "Recipient emails" with the value "info@yourcompany.co.uk". Below the "Recipient emails" field is a small blue arrow icon and the text "Input a comma-separated list of emails". At the bottom of the dialog is a large blue button labeled "Export".

Enter the From and To dates and a list of emails to receive the link. You can enter multiple email addresses separated by commas.

Click Export to send the link.

The link in the email allows you to download the data in CSV format. If opened in MS Excel the CSV data will look like this

	A	B	C
1	Timestamp	Human readable date	Oven - ch1
2	1.53494E+12	22/08/2018 13:32	84
3	1.53494E+12	22/08/2018 13:32	40
4	1.53494E+12	22/08/2018 13:32	58
5	1.53494E+12	22/08/2018 13:32	70
6	1.53494E+12	22/08/2018 13:15	78
7	1.53494E+12	22/08/2018 13:15	22
8	1.53494E+12	22/08/2018 13:15	51
9	1.53494E+12	22/08/2018 13:15	66

The Timestamp is in Epoch format. Each variable assigned to the widget has two columns in the CSV file.

The first contains the numeric data and is titled with **devicename_variablename** and the second column contains the context and is titled **context_devicename_variablename**. The context column is only useful for certain device types that deliver text based data such as GPS data.



Duplicate – This will pop up a dialog box asking if you are sure you want to duplicate the widget. If you choose to duplicate then an exact copy of the widget will be created.



Share – This will pop up a window allowing you to copy a URL link to a public copy of this widget and an HTML snippet to embed this widget into your own web pages.

Share widget

Averaged and Gust [2 Days]

Date range: Dashboard's default

Public Link: <https://www.sensorspace.com/app/dashboards/public/widget/aPCjFL6IQJ9bmo>

Embed: Add the following snippet to your HTML

```
</> <iframe width="100%" height="666" frameborder="0" src="https://www.sens
```

REGENERATE LINK

Close

Date Range – select the required date range for the displayed widget.

Current selection
Dashboard's default
Custom (Date picker)

Current Selection – The current data range selected in the dashboard.

Dashboard's Default – The default data range set for this dashboard.

Custom (Date Picker) – Allow the viewer to select the data range.

Regenerate Link – This will generate a new public link for this widget and will stop any previous links from working.

Close – close the dialog box and return to the dashboard.



Edit – This takes you back to the widget properties panel that you will be familiar with from when the widget was first created.



Delete - Delete the widget. No underlying variable data will be lost.

Colour Selection Pop-Up

Many widgets allow colours to be selected for certain properties. This is triggered by clicking the square colour swatch or colour code displayed in the widget property panel which will display a pop-up window.



There are four ways to select the required colour.

- You can click on one of the nine pre-defined colour swatches at the bottom of the pop-up window.
- Select a colour by clicking the horizontal colour spectrum bar to then click in the large colour shade box to select the required intensity of the colour.
- Type the RGB (Red, Green and Blue) values into the RGB numeric fields.
- Type an HTML compatible Hex colour code into the Hex field.

Click somewhere else in the properties panel to close the pop-up.

See [Appendix D – Hex Colour Codes](#)

Moving Widgets

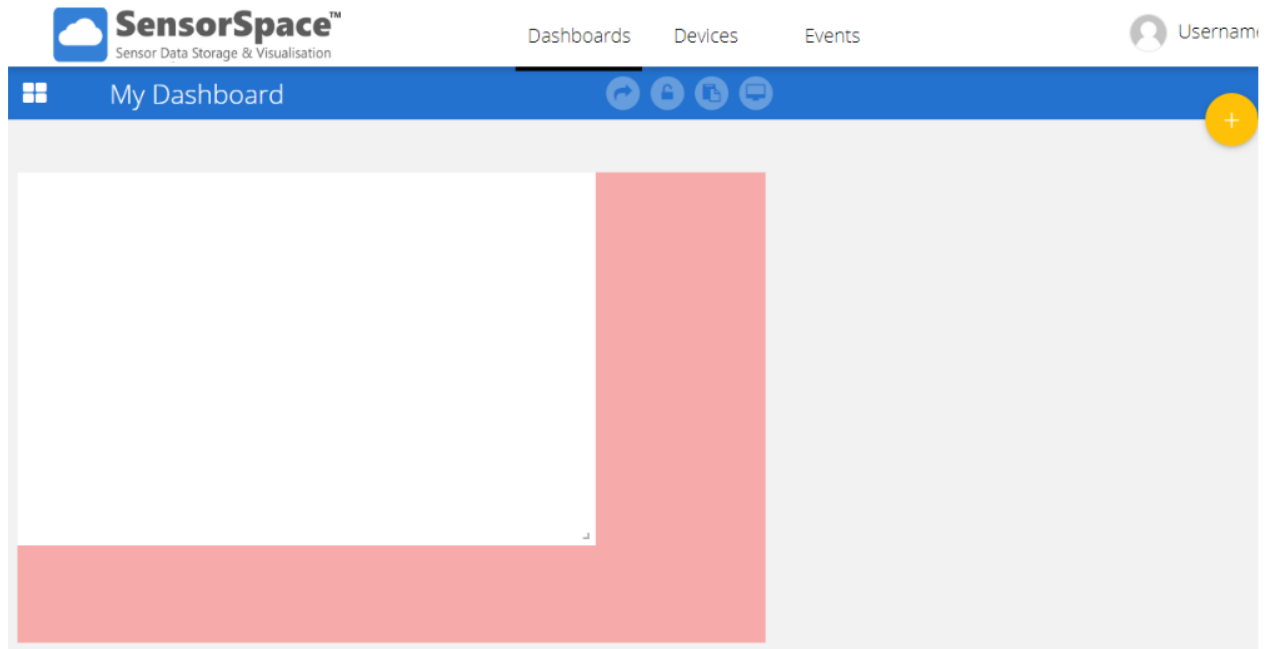
Ensure that the dashboard is not locked. Place the mouse over the title of the widget and click and drag the widget to a new location on the dashboard.

Resizing Widgets

Hover the mouse over the lower right of the widget until you see the resize icon.



Click and drag to resize.



Renaming Widgets

Double-click on the title of the widget and it becomes editable. Type the title you want then press the Return/Enter key.

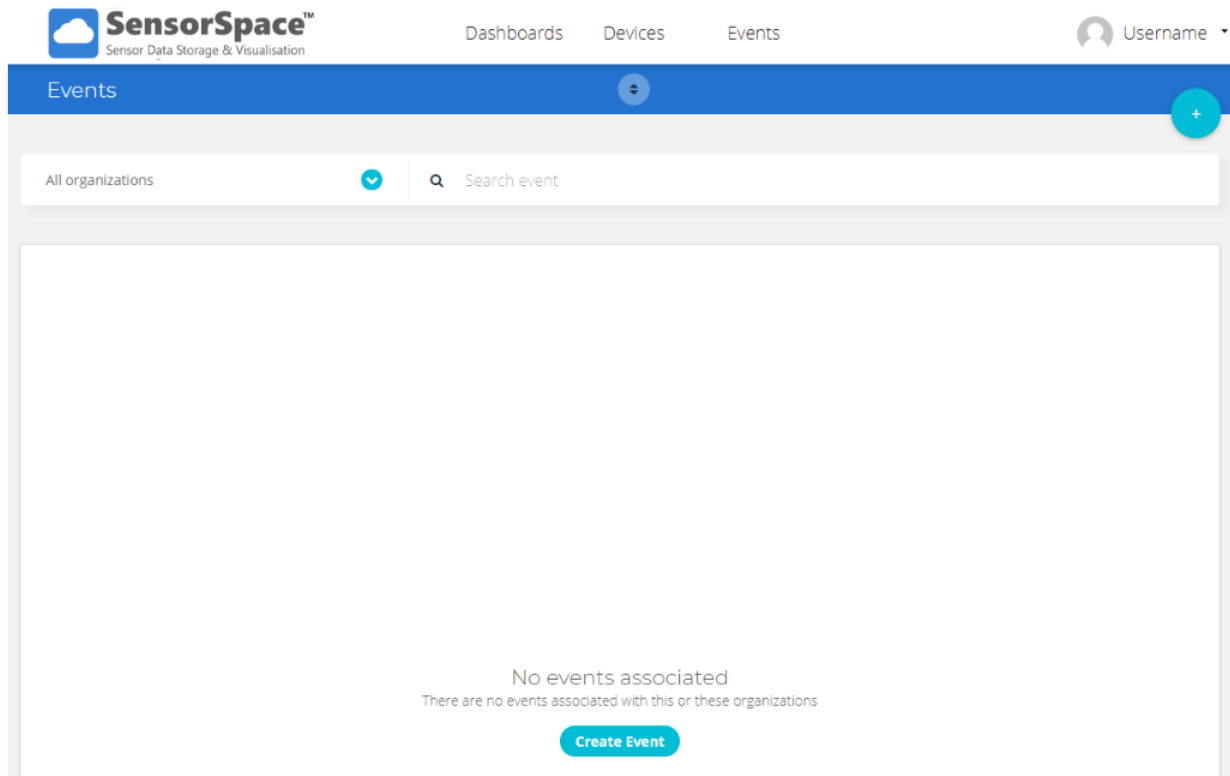
Events

You arrive at this page by clicking **Events** on the main menu bar at the top of the browser page. There are two types of event available.

Standard Event - a flexible, simple to use, events and alerts feature of Conditional statements. A conditional is any **IF / Then statement** arranged to qualify an action based on a series of inputs (or lacking inputs). The event can then trigger an action such as sending a message or changing the value of a variable.

Scheduled Event – This event is more advanced and tricky to setup but does provide actions and variable value changes based on scheduled events set by the user rather than by the change in value of variables.



Select Events from the main menu.

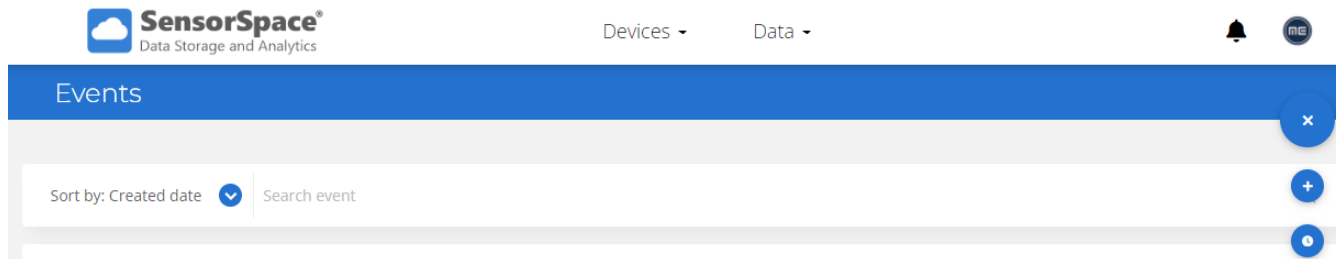


Standard Conditional Event

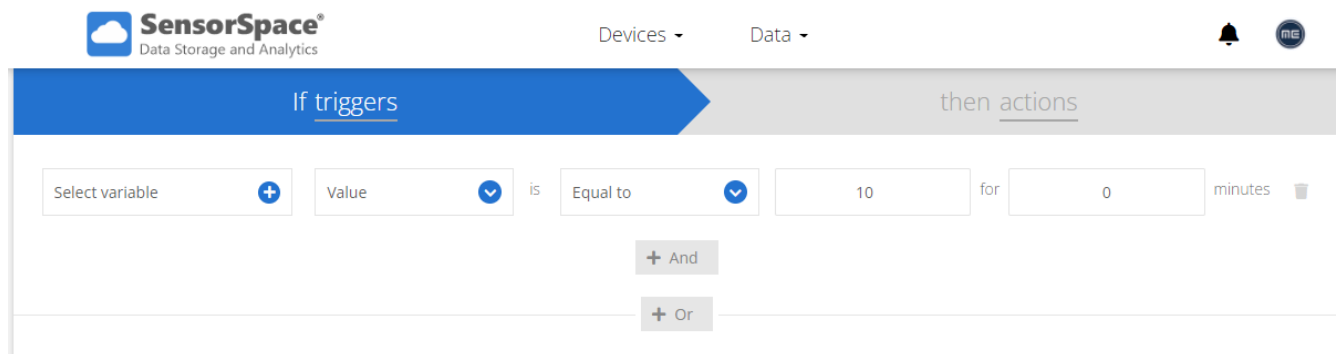
When there are no events you will see the empty event list.
If events are present you will see a list of them, see [Event List](#).

Hover the mouse pointer over the  button that is always present at the top right.

You then have the option of selecting a conditional event  or a scheduled event .




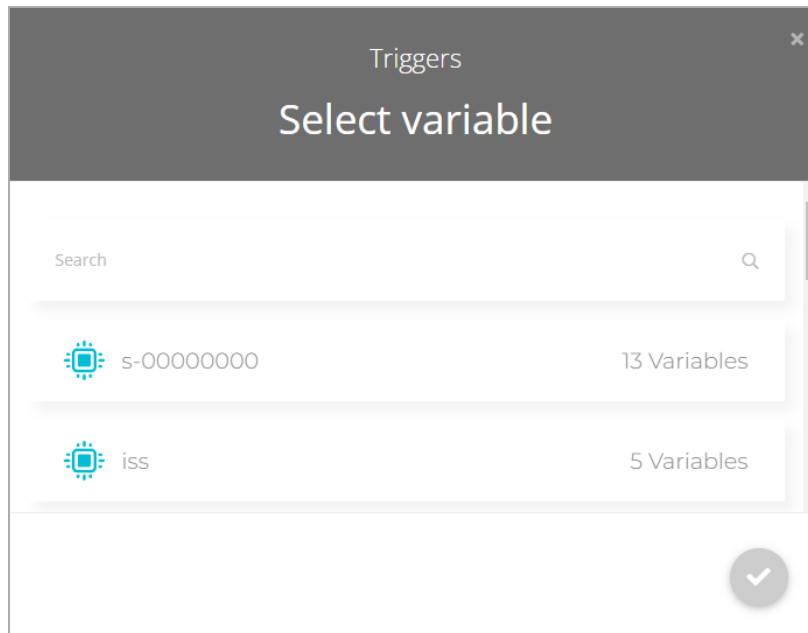
Click the  button to create a new conditional event.



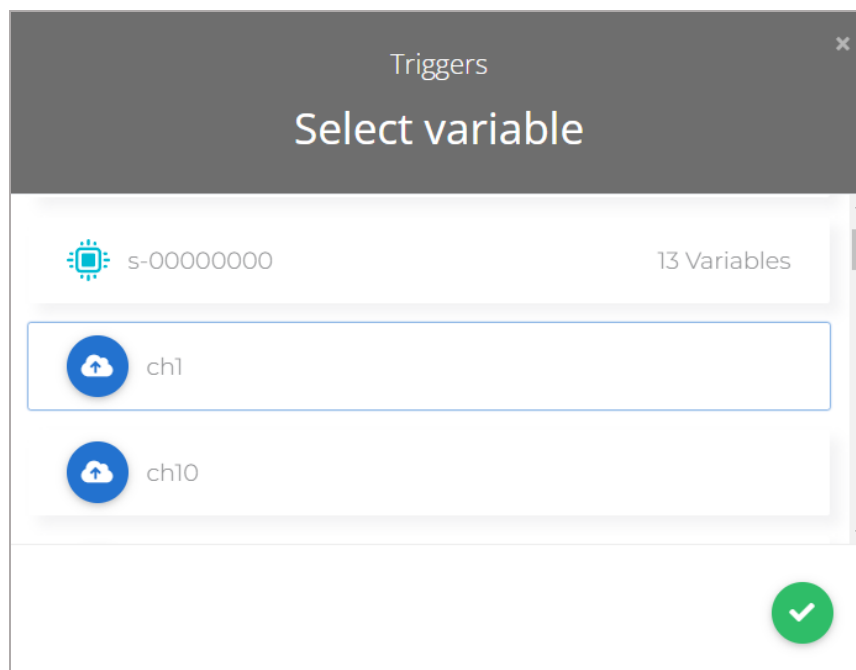
You can now build the criteria that triggers the event.

Variable Selection

First select the variable to test by clicking the  to see a familiar list of devices.

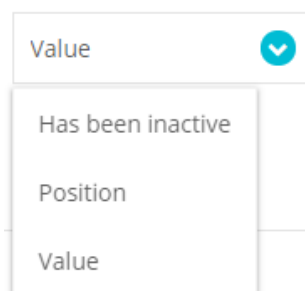


As you click on a device the list will expand to show the variables associated with the selected device.



Select the desired variable and click the green tick.

Next click the Value ▼ section to drop down a list with three options



Type Selection

Has been Inactive


Selecting this option allows you to trigger the event when no data has arrived for the selected variable for longer than you specify.


Select variable 

Has been inactive 

for

10

minutes 



Simply select the timeframe in Minutes, Hours or Days and enter the desired numeric value.

Position

This option is only relevant when the selected variable carries positioning data and allows areas to be marked on a map so that events are triggered when the delivered position data either enters or exits these geographic areas.

Select variable 

Position 

Enters 

Edit Geofence 

for

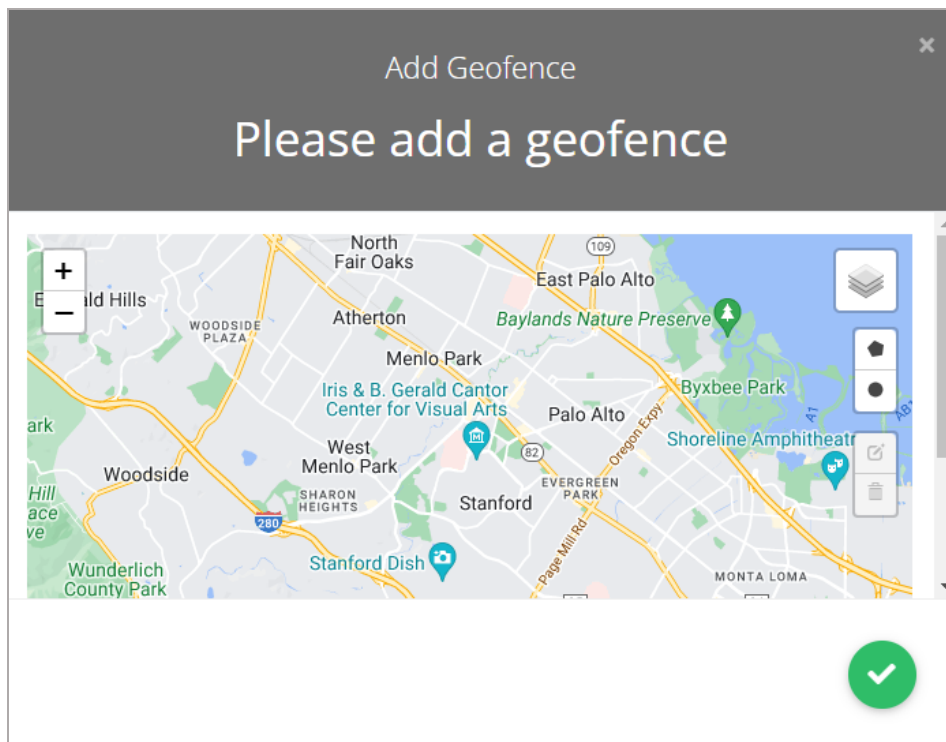
0

minutes



Select either **Enters** or **Exits** then click on the **Edit Geofence** section.


This displays a further pop-up displaying a map.

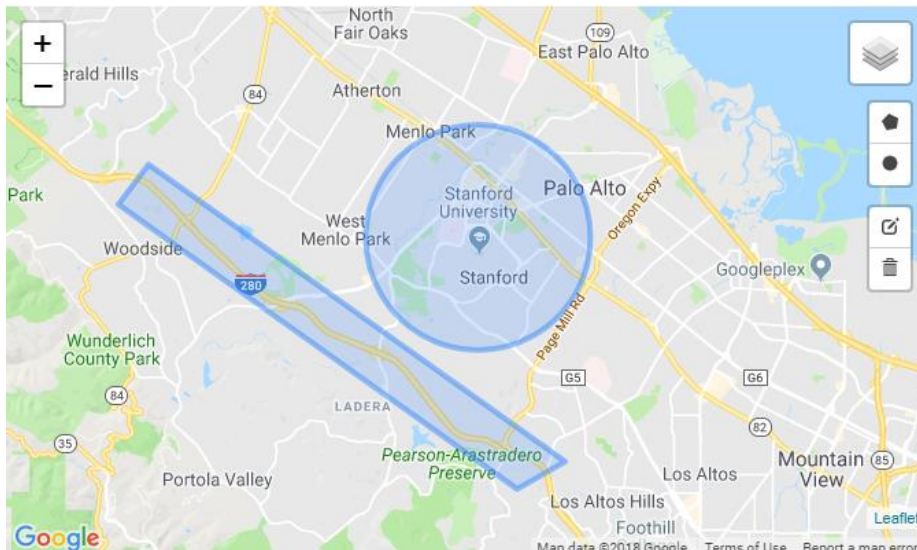


The map can be panned by clicking and dragging and zoomed in and out using the mouse wheel or the + - buttons.

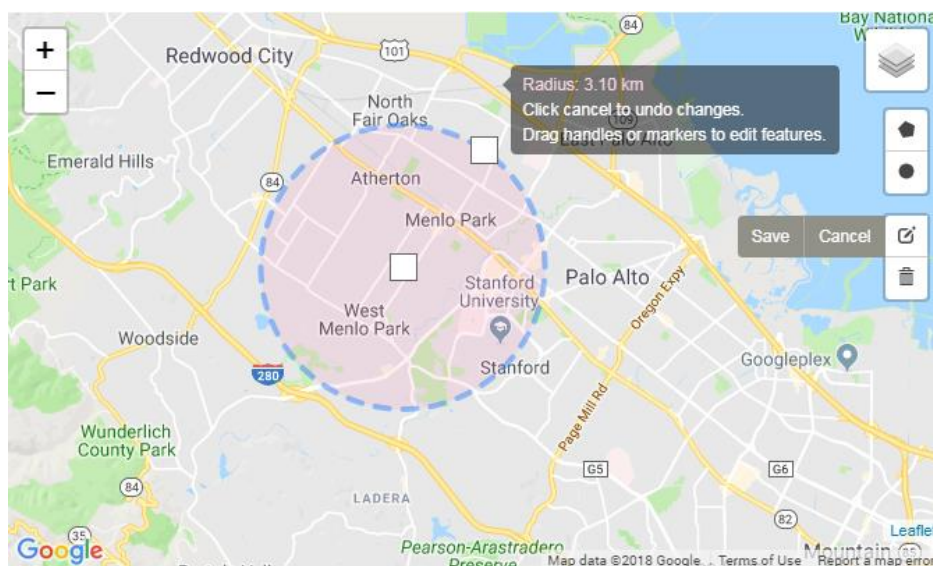
Use the  button to select either Road View or Satellite View. Next you can define the geofence areas by either drawing a circle or creating a polygon.

Click the  to then click on the map to define the centre of the circle and drag to define the size of the circle.


Click the  to place points on the map that will be connected together to form a closed polygon.

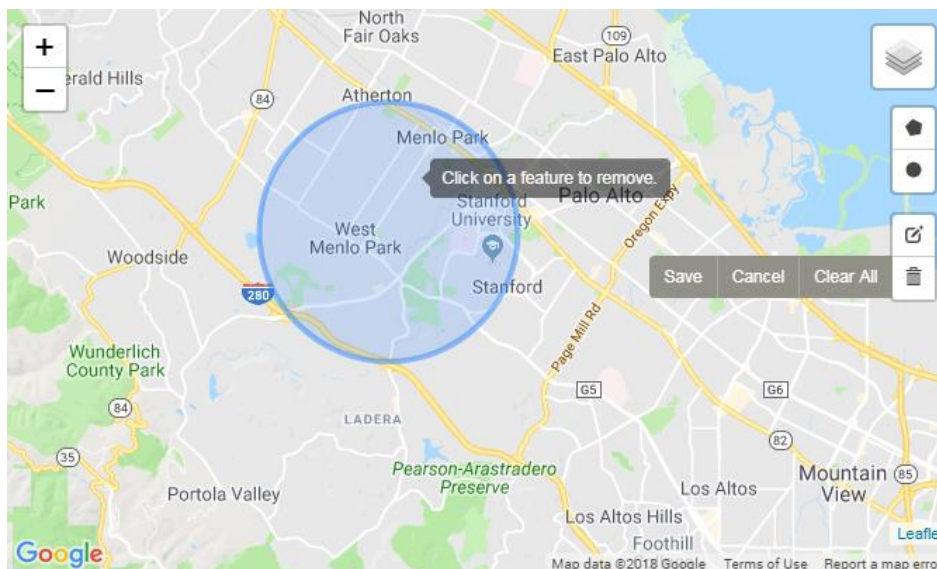


Click the  button to edit existing defined areas.



Click Save on the small fly out menu when the changes have been made.

Click  to select defined areas for deletion.



Click Save on the small flyout menu when the changes have been made.

Remember to click the green tick to save your defined areas.



Clicking the Edit Geofence section will allow the regions to be edited in the future.

s-00000000: ch1

+

Position

▼

Enters

▼

Edit Geofence

+

for

0

minutes

+

And

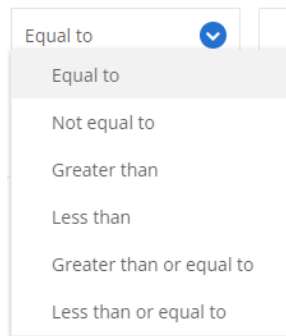
+

Or

Now all that is left is to enter the number of minutes that the variable position must be either within or outside before the event triggers.

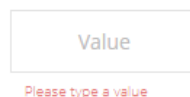
Value

This trigger type is based on the value of a variable. Select the criteria from the section initially marked Equal.



A dropdown menu with a blue downward arrow icon. The menu is open, showing the following options: "Equal to" (highlighted), "Not equal to", "Greater than", "Less than", "Greater than or equal to", and "Less than or equal to".

This is how the variable value will be compared to the manually entered value in the next section.



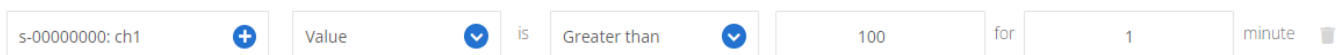
A text input field with the placeholder text "Value". Below the field, there is a red error message: "Please type a value".

Then you have the ability to define how long the statement must be true before the event actually triggers.



A text input field containing the number "0", followed by the text "minutes" and a trash icon.

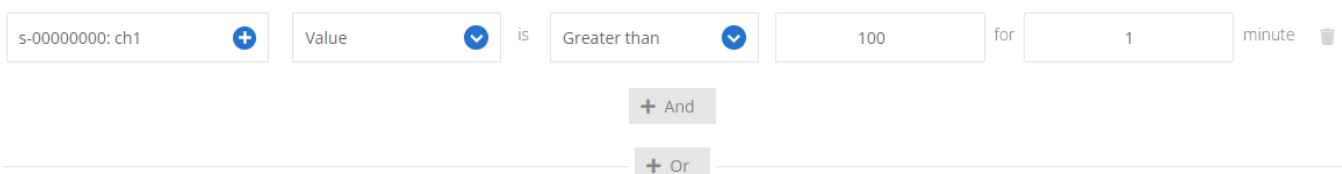
For example the following shows the event for channel 1 value to be greater than 100 for at least 1 minute.



A configuration row for a trigger. It starts with a variable "s-00000000: ch1" and a plus icon. This is followed by a dropdown menu showing "Value". Then is the word "is", followed by a dropdown menu showing "Greater than". This is followed by a text input field containing "100". Then is the word "for", followed by a text input field containing "1". Finally, there is the word "minute" and a trash icon.

Stacking Triggers

After a single trigger has been added you have the option to stack further triggers to create complex trigger scenarios.




A configuration row for a trigger, identical to the one above. Below this row, there are two buttons: "+ And" and "+ Or".

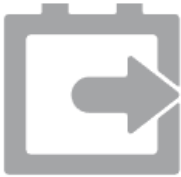
The logic is built up by clicking either **+ And** or **+ Or** below the relevant trigger. Each time you click the OR you are in effect creating a new grouped set of triggers as shown below. For example (A and B and C) or (D and E) or (F)

Click the  to add an action.

If triggers

then actions





Trigger actions

You may trigger several actions within the same event.

Add new action

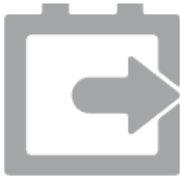
<

>

You can now select one of the actions to perform.

If triggers


then actions





Trigger actions


You may trigger several actions within the same event.


Add new action


 Send Email


 Send SMS

 Send Telegram

 Voice Call

 Set Variable

 Slack

 Trigger WebHook

Actions

You can add multiple actions to an event. After you add each action you are returned to the page that lists the actions. See Action List later.

Action Types

Send Email

Send emails to multiple destinations (sharing the same message content) for both when the situation first occurs and when everything returns to normal.

Email Address Enter the destination email address. You can add multiple destinations by using a comma to separate them.

Active Trigger Clicking this header allows you to enter the subject and message sent when the event is triggered.

Subject Enter a subject line for the email message. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow. [Inserting custom fields](#) will be explained further on in the manual.

Message Enter the message body of the email. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow. [Inserting custom fields](#) will be explained further on in the manual.

Back to Normal Click this header to set the subject and message sent when the triggers that caused the event to fire are no longer present. i.e. the situation is back to normal. Just select the 'Trigger this action...' checkbox and enter the required message.



Click to complete this action.

Send SMS

Send SMS messages to multiple destinations (sharing the same message content) for both when the situation first occurs and when everything returns to normal.

The screenshot shows the 'Send SMS' configuration screen. It is divided into two main panels: 'If triggers' and 'then actions'. The 'If triggers' panel includes a 'Country' dropdown (set to '1 United States'), a 'Phone Number' input field, and an '+ Add phone number' button. The 'then actions' panel has two tabs: 'ACTIVE TRIGGER' and 'BACK TO NORMAL'. The 'ACTIVE TRIGGER' tab is active, showing a 'Message' input field with a pre-filled template: 'Hey there, [Variable name] was [Trigger value] at [Trigger timestamp]'. A green checkmark button is at the bottom right.

Country Select the destination country from the drop-down list.

Phone number Enter the destination telephone number. Remember to omit leading zero when using country code.

Add Phone Number Adds another Country and Phone number section for additional numbers.

Active Trigger Clicking this header allows you to enter the message sent when the event is triggered.

Message Enter the message here. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow. [Inserting custom fields](#) will be explained further on in the manual.

Back to Normal Click this header to set the message sent when the triggers that caused the event to fire are no longer present. i.e. the situation is back to normal. Just select the 'Trigger this action...' checkbox and enter the required message.

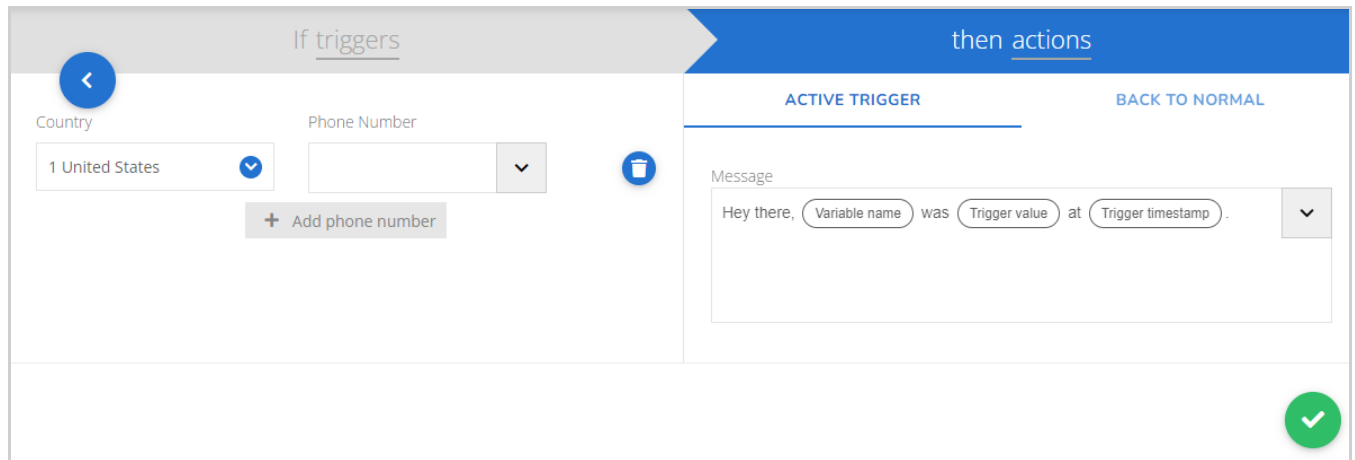



Click to complete this action.

Send Telegram

Send Telegram messages to multiple destinations (sharing the same message content) for both when the situation first occurs and when everything returns to normal.

You need a Telegram account for this messaging service to work. See <https://telegram.org/>




- | | |
|---|--|
| Country | Select the destination country from the drop-down list. |
| Phone number | Enter the destination telephone number. Remember to omit leading zero when using country code. |
| Add Phone Number | Adds another Country and Phone number section for additional numbers. |
| Active Trigger | Clicking this header allows you to enter the subject and message sent when the event is triggered. |
| Message | Enter the message here. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow. Inserting custom fields will be explained further on in the manual. |
| Back to Normal | Click this header to set the message sent when the triggers that caused the event to fire are no longer present. i.e. the situation is back to normal. Just select the 'Trigger this action...' checkbox and enter the required message. |
|  | Click to complete this action. |

Voice Call

Sometimes Emergencies require a true voice phone call because SMS or Email simply takes too long to acknowledge. Send Voice Calls notifications with SensorSpace in just a few simple steps.

The screenshot shows the 'Voice Call' configuration screen. It has a top bar with 'If triggers' and 'then actions' tabs. The 'If triggers' tab is active and contains fields for Voice (Alice), Language (English (United States)), Country (+1 United States), and Phone Number. There is a '+ Add phone number' button and a trash icon. The 'then actions' tab is also visible and contains a 'Message' field with a template: 'Hey there, {Variable name} was {Trigger value} at {Trigger timestamp}'. A green checkmark button is at the bottom right.

- | | |
|---|---|
| Voice | Select the voice for the message to be read in. Either John (male) or Alice (female). |
| Language | Choose the Voice Language (English, Catalana, French, Spanish, Dutch, German, Portuguese, and MORE). |
| Country | Select the destination country from the drop-down list. |
| Phone number | Enter the destination telephone number. Remember to omit leading zero when using country code. |
| Add Phone Number | Adds another Country and Phone number section for additional numbers. |
| Active Trigger | Clicking this header allows you to enter the message sent when the event is triggered. |
| Message | Enter the message to be read. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow. Inserting custom fields will be explained further on in the manual. Bear in mind that this message will be spoken. |
| Back to Normal | Click this header to set the message sent when the triggers that caused the event to fire are no longer present. i.e. the situation is back to normal. Just select the 'Trigger this action...' checkbox and enter the required message. |
|  | Click to complete this action. |

Set Variable

This allows the event to set one or more variables from any device to a selected numeric value.

The screenshot shows the 'Set Variable' configuration interface. It has two main sections: 'If triggers' (grey) and 'then actions' (blue). In the 'If triggers' section, there is a 'Variable' section with a 'Select variable' dropdown and a plus button. In the 'then actions' section, there is a 'Message' section with a text area containing a JSON object: `{"value":"","context":{}}`. Above the text area are tabs for 'ACTIVE TRIGGER' and 'BACK TO NORMAL'. A green checkmark button is at the bottom right.

Variable Click to select a device and a variable. You can click the plus button to add more than one variable.

Message Here you can enter a JSON format message to send to the selected variables. It is important to enter a valid JSON object and worth getting to understand how this works as a more complex JSON message can be used in the scheduled events. The format must be as follows:

```
{"value":VALUE, "context": { "CONTEXTNAME" : "CONTEXTVALUE" } }
```

To set the value of the variable simply replace VALUE with either a typed value or use the down arrow to include a custom field from the triggering criteria. So in its simplest form you may want to set the value of the variable to 10 so would enter:

```
{"value":10}
```

Or if you wanted to include the value from the triggering variable (Use the drop down arrow to add a custom field):

```
{"value": Trigger value }
```

The context is optional and allows text to be recorded against a variable's data point. These contexts (There can be any number you want) can be displayed using a Metric Widget or may appear in the various table widgets available. While primarily used for geo data, contexts can be a neat way of labelling data points.

For example, you may want to add a context called state that shows whether something is Active or Inactive.

```
{"value":10,"context":{"state":"Active"}}
```

If you wanted to add more contexts separate the name and value pairs by a comma. In the next example we will add the name of the variable that caused the event to trigger to a context named trigger.

```
{"value":10,"context":{"state":"Active","trigger":Variable name "}}
```

Make sure that the context values are always enclosed in quotes as these are text based.



Click to complete this action.

Slack

This allows messages to be sent to the Slack messaging and collaboration platform. This is a little more complex to setup than other actions.

To configure Slack events from SensorSpace there is a little integration to do using the Incoming Webhook App which is powered by Slack. The Incoming Webhooks App is a simple way to post messages from SensorSpace into Slack. The webhooks make use of normal HTTP requests with a JSON payload.

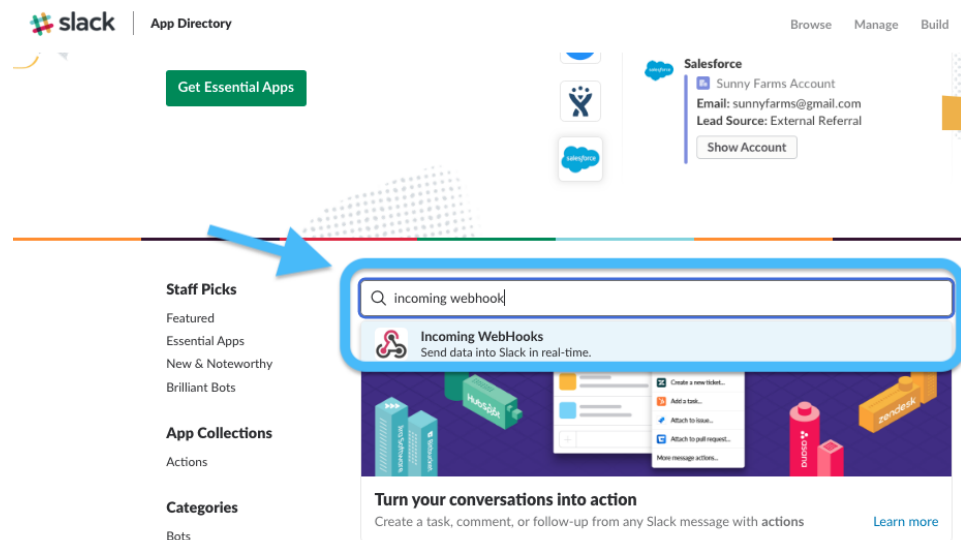
Follow the simple steps below to configure your Slack events with SensorSpace and keep your office up-to-date and on-time.

From (Bot name)	Enter your username.
Type bot icon	Select either Emoji or Image.
Or, Bot icon emoji	Select the emoji to send.
To (Channel or user)	<p>Enter the destination channel or user name.</p> <p>With SensorSpace Slack Events your Apps can notify a #team or any @individual team member you need. To send events to team channels or an individual use the below structure, including the symbols. BE SURE TO SPELL EVERYTHING CORRECTLY.</p> <p>Slack Event to a #Team Channel: #ExampleTeamName</p> <p>Slack Event to a @Individual Team Member: @ExampleIndividualName</p>
Webhook URL	<p>Enter the webhook URL.</p> <p>To complete the configuration of the Slack event, you must locate the correct URL end-point of your private slack channel. Follow the simple steps below to locate the correct URL webhook endpoint so that your SensorSpace Slack Event can be delivered reliably to the correct Slack channel.</p>

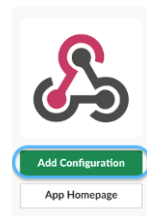
1. Access the Apps section of your Slack account and add the App "Incoming WebHooks" from the Slack App Directory.

The URL to access a team's Slack channel APPS is as follows:

```
https://CHANNEL_NAME.slack.com/apps
```

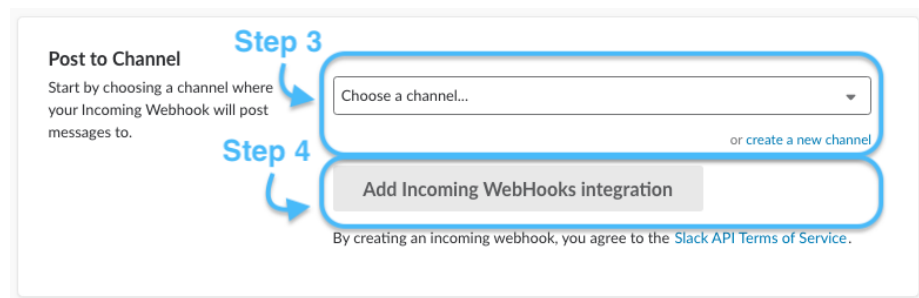


2. Next, create or "Add Configuration"

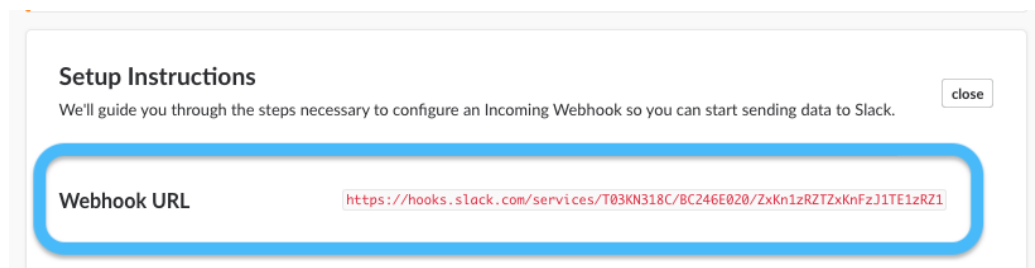


3. Create the Post to Channel URL by selecting which Slack Channel you would to reach, or create a new channel.

4. Then, "Add the Incoming Webhooks Integration"



5. Next, copy and paste the Webhook URL from Slack into the SensorSpace Event Setup.



Active Trigger Clicking this header allows you to enter the message sent when the event is triggered.

Back to Normal

Click this header to set the message sent when the triggers that caused the event to fire are no longer present. i.e. the situation is back to normal. Just select the 'Trigger this action...' checkbox and enter the required message.


Message

Enter the message body here. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow. [Inserting custom fields](#) will be explained further on in the manual.





Click to complete this action.

The new Slack action will then be added to the action list.

 Slack message to #notifications

Hey there, {{variable.name}} was {{last_value}} at {{trigger_times...}}

Trigger Webhook

A webhook is a method of augmenting or altering the behaviour of a web page, or web application, with custom callbacks. These callbacks may be maintained, modified, and managed by third-party users and developers who may not necessarily be affiliated with the originating website or application.

The screenshot shows the 'Trigger Webhook' configuration interface. It is divided into two main sections: 'If triggers' (grey background) and 'then actions' (blue background).
In the 'If triggers' section, there is a dropdown menu for 'HTTP Method And URL' with 'POST' selected. Below it is a text field for the URL, containing 'http://example.com/?do=foobar'. Underneath the URL field is a 'Headers' section with a dropdown for 'Content-Type' set to 'application/json'. A '+ Add header' button is located below the headers section.
In the 'then actions' section, there is an 'ACTIVE TRIGGER' section. It contains a 'Body' text area with a JSON payload: `{ "name": "Device name", "value": "Trigger value", "datetime": "Timestamp" }`. To the right of the 'ACTIVE TRIGGER' section is a 'BACK TO NORMAL' link. A green checkmark icon is visible in the bottom right corner of the interface.

HTTP Method This is the HTTP method with which the payload will be handled. The methods allowed by SensorSpace are: Get, Head, Delete, Post, Put, Patch

URL This is the server endpoint that will receive the webhook payload

Headers Certain headers may be required by the web service you are delivering into. You can add more headers and their associated value by clicking Add Header.
A Content-Type header is already prefilled in and this is used to differentiate between payload data types. Webhooks would probably be delivered using one of the following content types but this will actually be determined by the destination service.

The **application/json** content type will deliver the JSON payload directly as the body of the POST.

The screenshot shows the 'Headers' section of the configuration interface. It displays two headers: 'content-type' and 'application/json'. There is an 'Add Header' button with a plus icon and a trash icon to the right.

The **application/x-www-form-urlencoded** content type will send the JSON payload as a form parameter called "**payload**".

The screenshot shows the 'Headers' section of the configuration interface. It displays two headers: 'content-type' and 'application/x-www-form-urlencoded'. There is an 'Add Header' button with a plus icon and a trash icon to the right.

Active Trigger Clicking this header allows you to enter the body sent when the event is triggered.

Body Enter the message payload here. You can include references to the variable that triggered the event by selecting an item from the custom field list accessed by clicking the down arrow.
[Inserting custom fields](#) will be explained further on in the manual.
What is actually entered here will depend on the service you are hooking into. This may or may not be in JSON format.

**Back to
Normal**

Click this header to set the message sent when the triggers that caused the event to fire are no longer present. i.e. the situation is back to normal. Just select the 'Trigger this action...' checkbox and enter the required message.



Click to complete this action.

Inserting Custom Fields

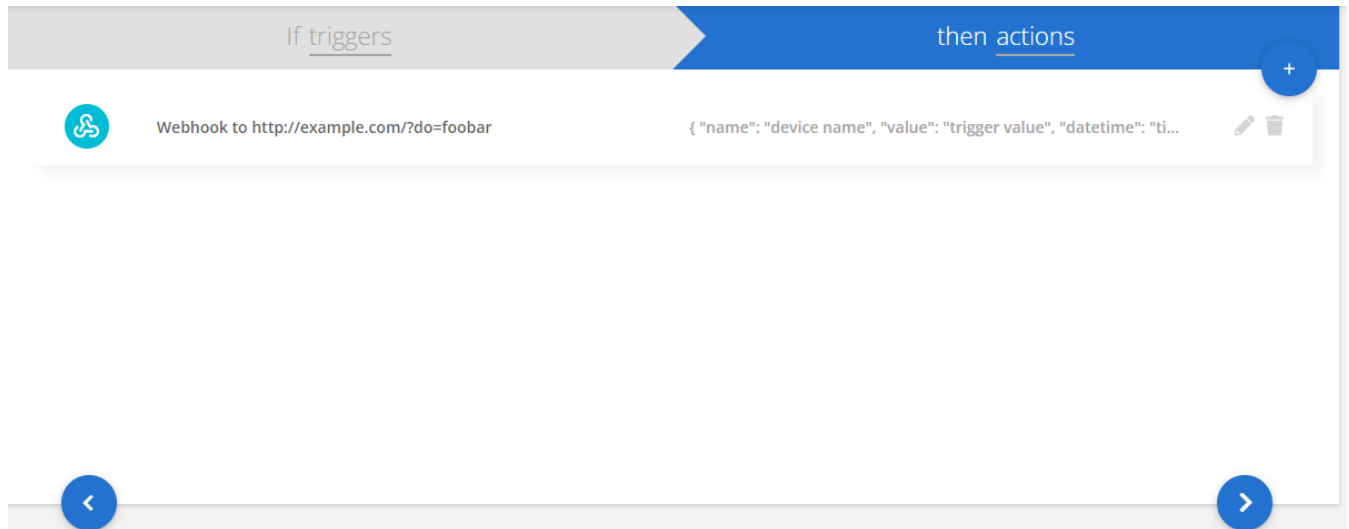
Many of the action types support the insertion of information about the triggering variable in the message body or subject.

You can either select the item from the list (Click the down arrow next to the text edit field) to insert it into the message or manually enter the token text.



Custom Field	Token text	Description
Context	<code>{{context.nnnn}}</code>	Insert the context text of the triggering variable where 'nnnn' is the name of the context. This is only useful on special variables that carry a textual context such as the status variable and any variables used to deliver GPS data. To insert the context text from the status variable you would base the event on the status variable and use <code>{{context.Status}}</code>
Device Label	<code>{{device.label}}</code>	This inserts the original device name assigned.
Device Name	<code>{{device.name}}</code>	This inserts the current device name which is the one you are able to change to better reflect your device.
Last Value	<code>{{last_value}}</code>	This inserts the last delivered value from the triggering variable.
Timestamp	<code>{{timestamp}}</code>	This inserts the timestamp of the last data received by the triggering variable if it was supplied whilst delivering the data.
Trigger Timestamp Variable	<code>{{trigger_timestamp timestampformat('Europe/London')}} {{variable}}</code>	This inserts the timestamp of when the event was triggered. You can specify the time format. This inserts the JSON format details of the variable in the following format: <code>{'name': 'Humidity Value', 'properties': {}, 'id': '9999999b1642ab67c1179c01d'}</code>
Variable ID	<code>{{variable.id}}</code>	This inserts the variables unique ID.
Variable Name	<code>{{variable.name}}</code>	This inserts the current variable name which is the one you are able to change to better reflect your variable.
Variable Properties	<code>{{variable.properties.nnnn}}</code>	This allows you to insert one of the properties assigned to the variables. The example to the left would insert the property named nnnn. Variable properties can only be created using the REST API.

Action List

After you have added at least one action you will be returned to the Action List page.



From here you can add another action or edit or delete an existing action by clicking the icons to the right of the event.

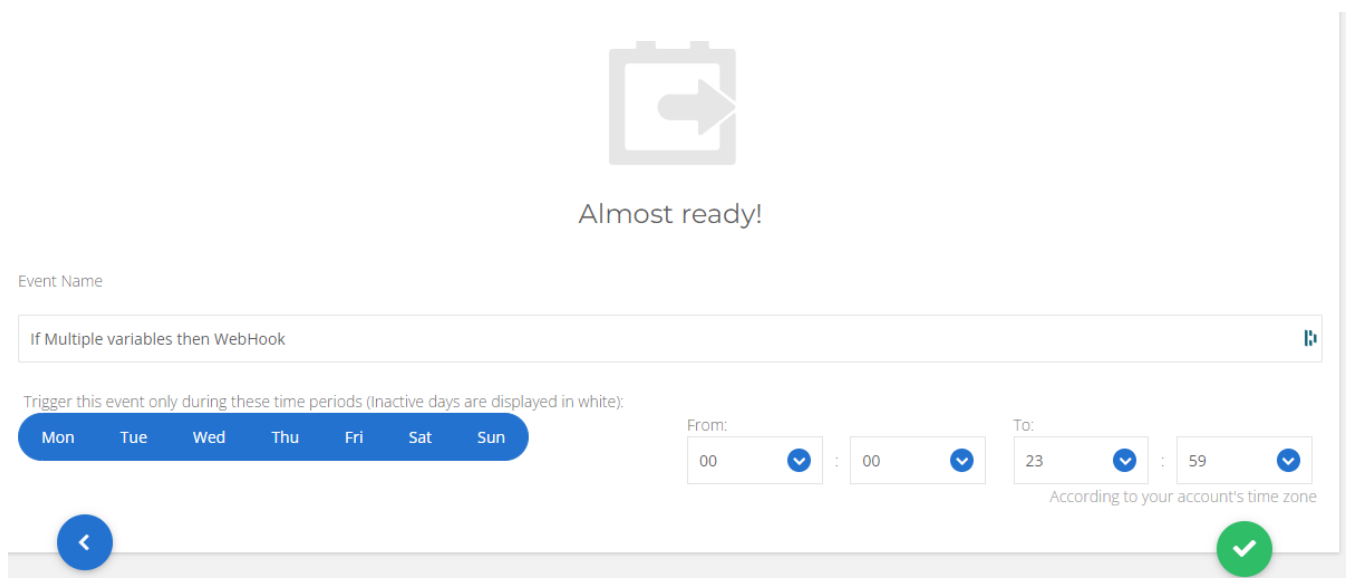
-  Edit the selected action.
-  Delete the selected action.

When complete, click the blue arrow on the lower right of the page.



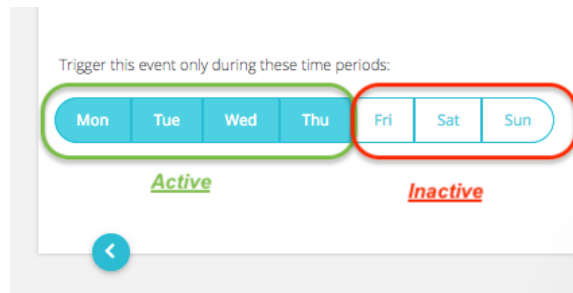
Event Windows

The next page you see allows you to specify when the event is active.



Event Name You can type a descriptive name for the event.

Trigger this event... Select which days the event will be active. Click on a day to toggle its active state. When the day is white the event is inactive.



From Set the start time that the event is active for all selected days.

To Set the end time that the event is active for all selected days.

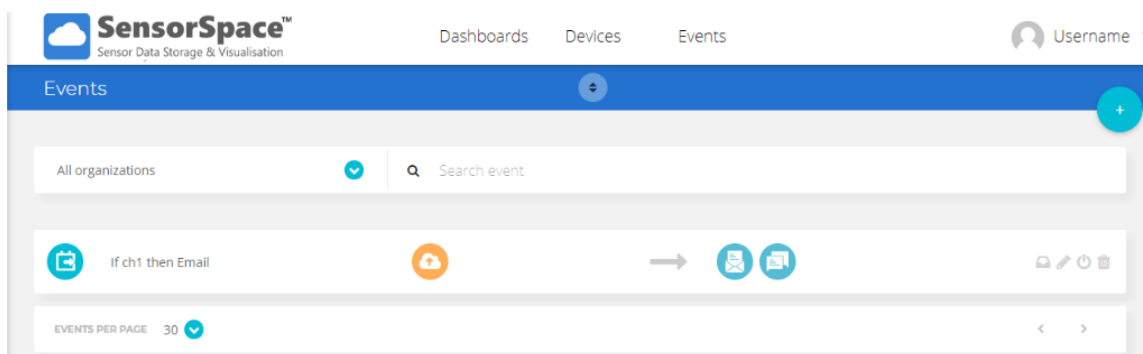


Click the green tick on the bottom right to continue.

This will take you back to the event list.

Event List

The event list is what you will see when selecting Events from the main menu and events already exist.



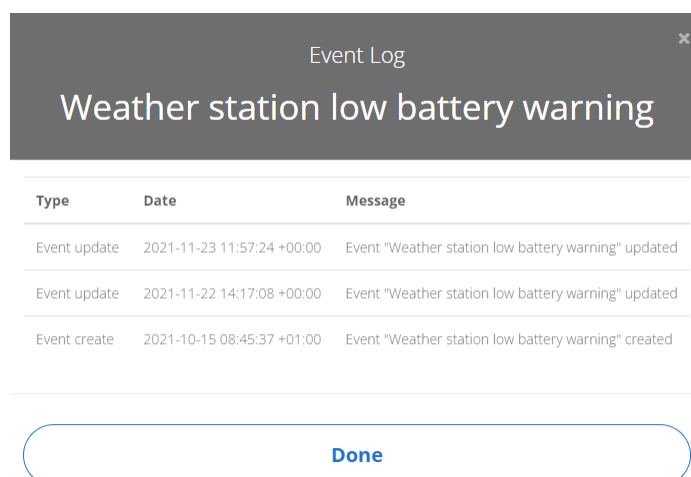
This view simply lists all created events. The icons show what type of actions are triggered and also shows the icons of the variables used in the triggers.

Just click on an event to take you back to the [trigger stack view](#).

The icons to the right of each event allow the following actions:



Log – This displays a pop-up window listing the times that the event triggered and the action.

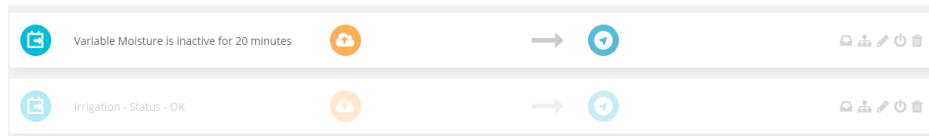




Edit the event. This will take you the [trigger stack view](#) again just like clicking on the event item itself.



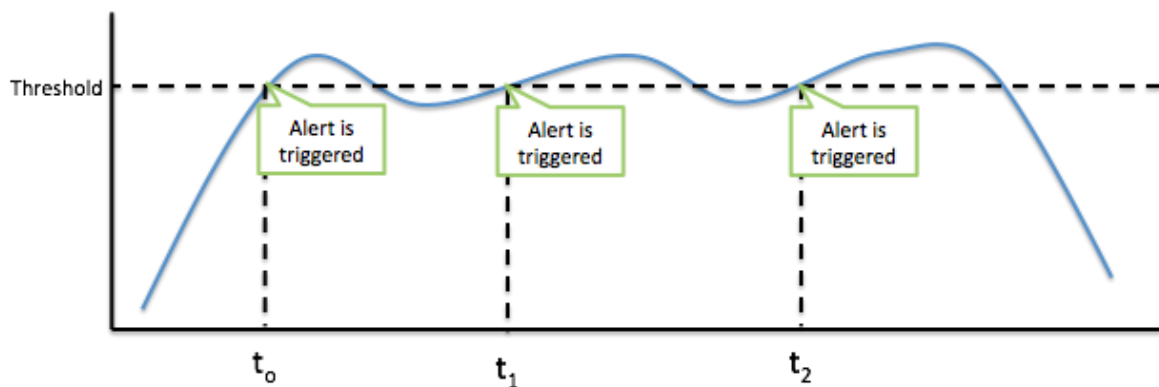
Enable/disable event. You can disable events so that they no longer trigger. Click this icon again to re-enable the event. A disable event will be displayed as washed out in colour.



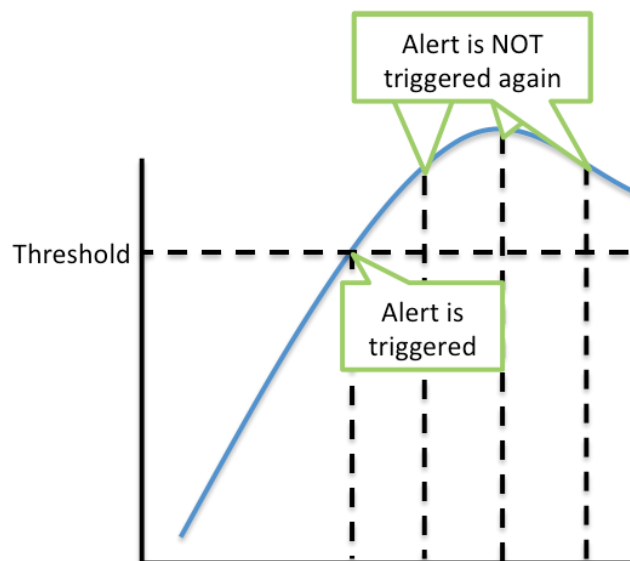
Delete the event.

When and how does a SensorSpace Event trigger:

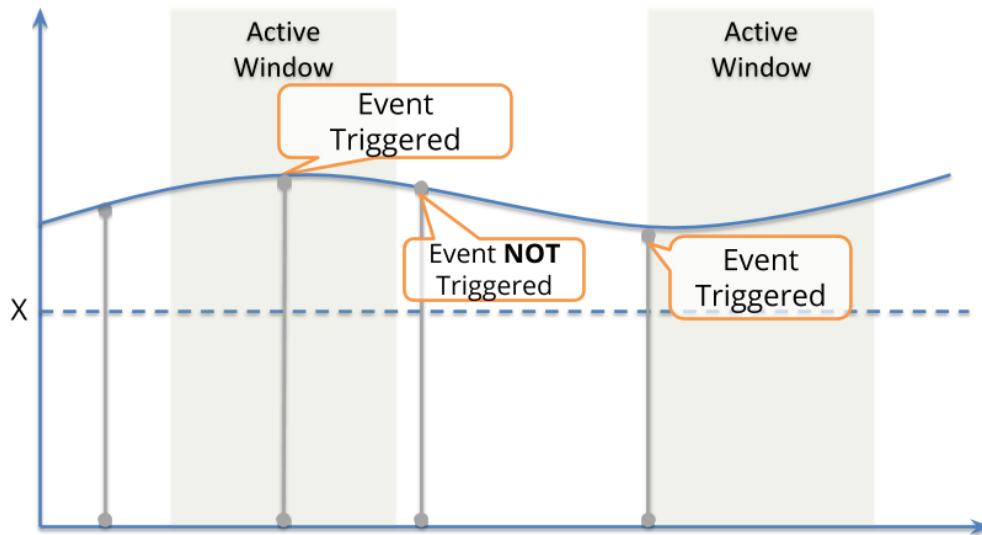
The figure below describes how the Events Engine triggers alerts inside SensorSpace core:



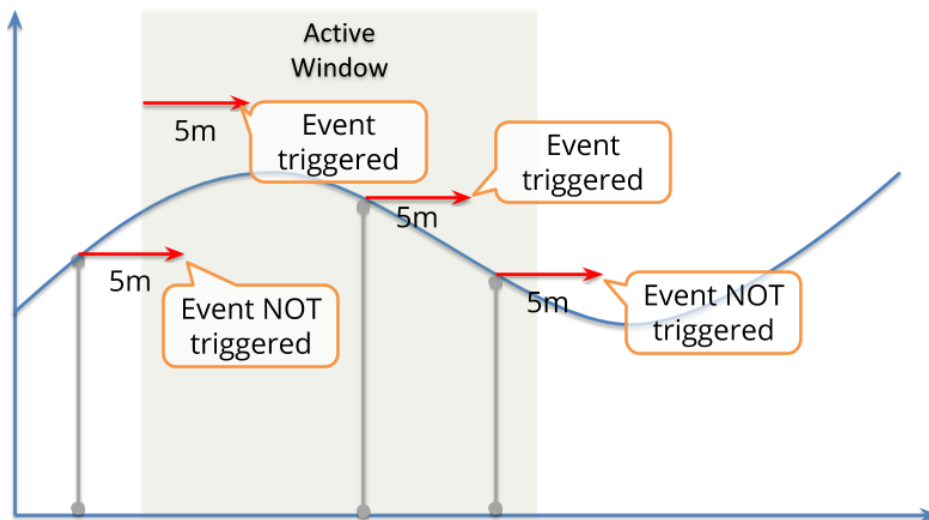
Please note that after an alert is triggered, the subsequent values will not trigger the alert again, even if they comply with the trigger conditions, unless the value goes outside the trigger condition and returns again:



Events can ONLY be triggered in an Active Event Window as depicted below. The vertical lines indicate data being delivered to SensorSpace.





'Has been inactive' condition events will ONLY be triggered if the inactiveness is within the active window. The diagram below shows vertical lines to indicate data being delivered to SensorSpace. And the red arrow indicates 5 minutes of inactivity which is used for this example event.

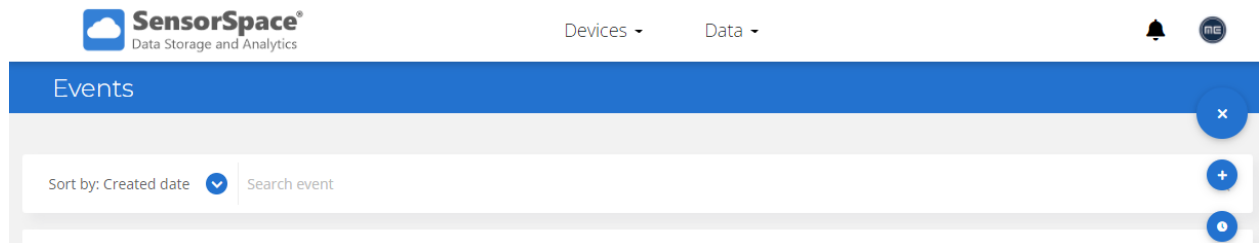



Scheduled Event

Scheduled events work to a schedule defined by you rather than reacting to variable conditions. A single event can contain multiple time triggers and each can define separate custom data that can be fed into multiple event actions.

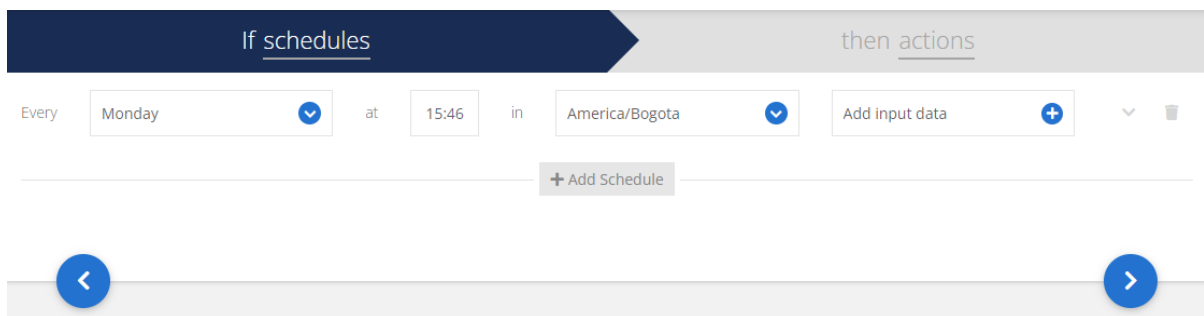
Hover the mouse pointer over the  button that is always present at the top right.

You then have the option of selecting a conditional event  or a scheduled event .



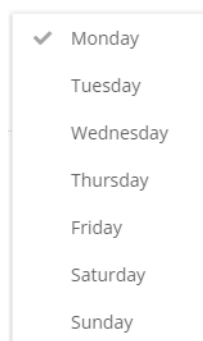
Click the  button to create a new scheduled event.

If Schedules



Every Selection

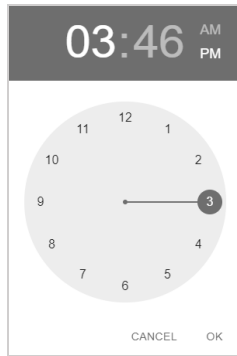
First click on the **Every** field to select which days the schedule applies to.



Just click to toggle a tick against all the days you want the event to occur on.

At Selection

Next click in the **at** field to select a time. Set the hour then the minute. (Ensure you select am or pm as required)



In Selection

Click the **in** field to select the correct timezone.

Input Data

Next click **Add input data** field to set up all the data that this particular time event can supply to the actions. This pops up a window to allow you to enter a JSON formatted data object that contains all the information you want to pass to the event action.

As we will see soon, this event can simply update the value and optionally a context of a variable. Here you can enter a JSON format message to send a selected variable or to pass on to the actions.. It is important to enter a valid JSON object and worth getting to understand how this is formatted. The format must be as follows:

```
{"value":VALUE, "context": {"CONTEXTNAME": "CONTEXTVALUE"}}
```

To set the value of the variable simply replace VALUE with a typed numeric value. So in its simplest form you may want to set the value of the variable to 10 so would enter:

```
{"value":10}
```

The context is optional and allows text to be recorded against a variable's data point. These contexts (There can be any number you want) can be displayed using a Metric Widget or may appear in the various table widgets available. While primarily used for geo data, contexts can be a neat way of labelling data points. For example, you may want to add a context called state that shows whether something is Active or Inactive.

```
{"value":10,"context":{"state":"Active"}}
```

If you wanted to add more contexts separate the name and value pairs by a comma. In the next example we will add the name of the variable that caused the event to trigger to a context named trigger.

```
{"value":10,"context":{"state":"Active","shift":"8 to 1 Shift"}}
```

Make sure that the context values are always enclosed in quotes as these are text based.

So the above is all that is required if you simply want to place a specific value, and optionally, specific contexts into a variable.

But later you can see that the actions can pull other custom values from a triggered time event.

To add a new value to be referenced later just add another key/value pair:

"KEY":VALUE"

Example: If you wanted to pass a telephone number at different times of the day to an action that sent an SMS message to certain users you could choose to add a key named 'telnumber'. Each timed event could set this key to a different number so that a single SMS action can refer to the 'telnumber' key to extract the specific value from the triggering timed event.

So if you did not need to pass a value to a variable you would not need the 'value' key so could just use:

```
{"telnumber":"08787654234"}
```

If you also wanted to pass a value into a variable you would include a 'value' key.

```
{"telnumber":"08787654234","value":2}
```

Click the **Save input data** button when done.

Once you have entered a scheduled trigger time you will see a button underneath to allow you to add more scheduled times (Each will have its own settings).

The screenshot shows a configuration interface for a scheduled trigger. It includes fields for frequency ('Every'), days ('Monday, Tuesday, Wednesday'), time ('15:58'), location ('Europe/London'), and a variable name ('{"telnumber":"08787654234"...'}). Below these fields is a button labeled '+ Add Schedule', which is circled in red. To the right of the variable field are a dropdown arrow and a trash icon.

There is also a delete icon to remove the time schedule,

This screenshot is similar to the previous one but includes a red circle around the trash icon located to the right of the variable field, indicating the delete function.

You will also see a down arrow to the right. This is what you can click to log data directly into a variable. Note that you will still require to add actions so this feature may be worth more as a debugging tool as one of the actions you can set is to update a variable.

This screenshot shows the same configuration interface as the previous ones, but with a red circle around the dropdown arrow icon to the right of the variable field, highlighting the option to log input data to a variable.

Log Input Data To A Variable

Clicking the down arrow shown above displays the following checkbox. Simply check the box and click the plus icon to add a variable.

The screenshot shows the expanded configuration interface. A checkbox labeled 'Log input data to a variable' is checked. Below it is a text input field containing 'iss: latitude' and a plus icon to add more variables. The rest of the interface remains the same as in the previous screenshots.

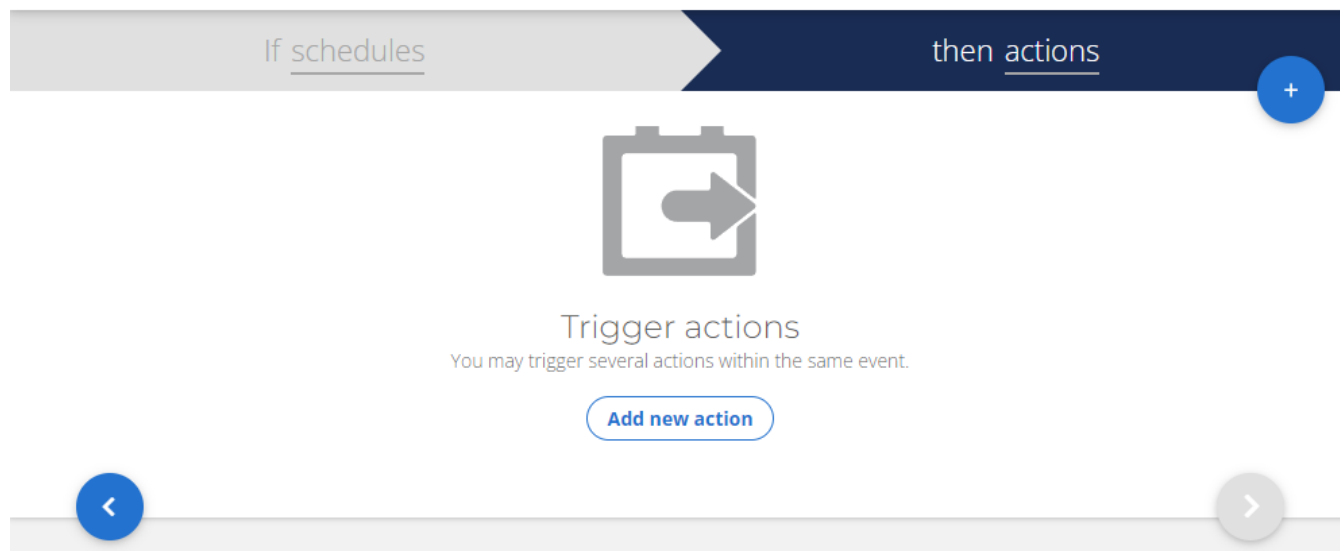
Remember that for this to work the event triggers must contain at least a key for 'value' and optionally keys for contexts.

When you have added all of the required scheduled time items click the

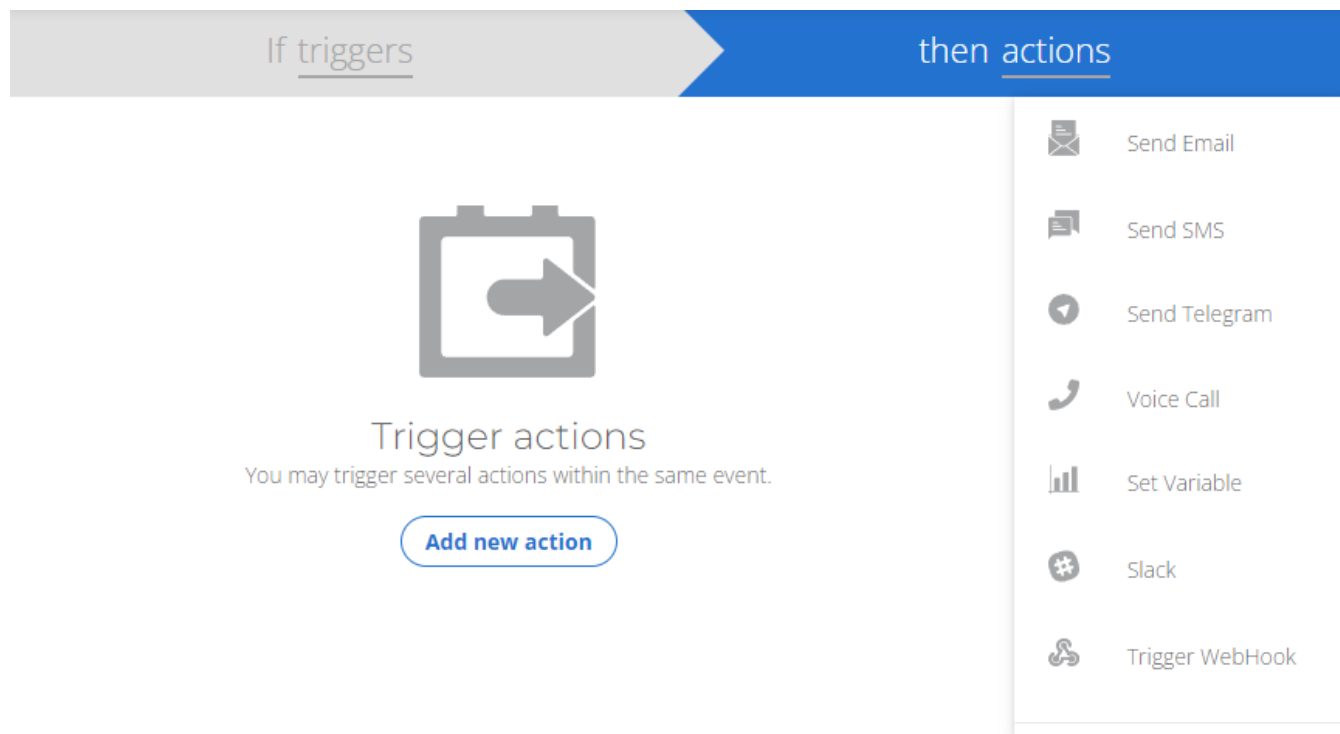


button to start adding the actions.

Then Actions



Either click the plus button or the Add new action button.



Actions

You can add multiple actions to an event. After you add each action you are returned to the page that lists the actions. See Action List later.

Action Types

Send Email

Send emails to multiple destinations (sharing the same message content) for both when the situation first occurs and when everything returns to normal.

The screenshot shows the 'Send Email' configuration interface. It is divided into two main sections: 'If schedules' (left, grey background) and 'then actions' (right, dark blue background). In the 'If schedules' section, there is a blue circular button with a left arrow, a text input field for 'Email Address' containing 'matt@mantracourt.co.uk', and a small downward arrow button. Below the input field is the text 'Add comma separated emails'. In the 'then actions' section, there is a 'Subject' input field containing 'Alert!', a 'Message' input field containing 'Hey there, ' followed by a 'Trigger timestamp' button, and a small downward arrow button. A green circular button with a white checkmark is located at the bottom right of the configuration area.

Email Address Enter the destination email address. You can add multiple destinations by using a comma to separate them.

Subject Enter a subject line for the email message. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. [Inserting custom value fields](#) will be explained further on in the manual.

Message Enter the message body of the email. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. [Inserting custom value fields](#) will be explained further on in the manual.



Click to complete this action.

[Send SMS](#)

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<

If schedules

then actions

Country
1 United States

Phone Number

+ Add phone number

Message
Hey there, Trigger timestamp

Country Select the destination country from the drop-down list.

Phone number Enter the destination telephone number. Remember to omit leading zero when using country code.

Add Phone Number Adds another Country and Phone number section for additional numbers.

Message Enter the message to be sent. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. [Inserting custom value fields](#) will be explained further on in the manual.




Click to complete this action.

Send Telegram

Send Telegram messages to multiple destinations (sharing the same message content) for both when the situation first occurs and when everything returns to normal.

You need a Telegram account for this messaging service to work. See <https://telegram.org/>


The screenshot shows the configuration for sending Telegram messages. It is divided into two main sections: 'If schedules' and 'then actions'. The 'If schedules' section includes a 'Country' dropdown menu (currently showing '1 United States'), a 'Phone Number' input field, and a '+ Add phone number' button. The 'then actions' section includes a 'Message' input field (containing 'Hey there, ' followed by a 'Trigger timestamp' button) and a blue arrow icon. A large green checkmark icon is located at the bottom right of the interface.

- | | |
|---|---|
| Country | Select the destination country from the drop-down list. |
| Phone number | Enter the destination telephone number. Remember to omit leading zero when using country code. |
| Add Phone Number | Adds another Country and Phone number section for additional numbers. |
| Message | Enter the message to be sent. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. Inserting custom value fields will be explained further on in the manual. |
|  | Click to complete this action. |

Voice Call

Sometimes Emergencies require a true voice phone call because SMS or Email simply takes too long to acknowledge. Send Voice Calls notifications with SensorSpace in just a few simple steps.

The screenshot shows the 'Voice Call' configuration interface. It is divided into two main sections: 'If schedules' (left) and 'then actions' (right). The 'If schedules' section contains fields for Voice (Alice), Language (English (United States)), Country (+1 United States), and Phone Number (empty). There is a '+ Add phone number' button and a trash icon. The 'then actions' section contains a 'Message' field with the text 'Hey there, ' followed by a 'Trigger timestamp' button and a dropdown arrow. A green checkmark button is at the bottom right.

- | | |
|---|---|
| Voice | Select the voice for the message to be read in. Either John (male) or Alice (female). |
| Language | Choose the Voice Language (English, Catalana, French, Spanish, Dutch, German, Portuguese, and MORE). |
| Country | Select the destination country from the drop-down list. |
| Phone number | Enter the destination telephone number. Remember to omit leading zero when using country code. |
| Add Phone Number | Adds another Country and Phone number section for additional numbers. |
| Message | Enter the message to be read. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. Inserting custom value fields will be explained further on in the manual.
Bear in mind that this message will be spoken. |
|  | Click to complete this action. |

Set Variable

This allows the event to set one or more variables from any device to a selected numeric value.

The screenshot shows a configuration interface for a scheduled event. It is divided into two main sections: 'If schedules' and 'then actions'. The 'If schedules' section contains a 'Variable' field with a 'Select variable' dropdown and a plus button. The 'then actions' section contains a 'Message' field with a JSON object: {"value": "", "context": {}}. A green checkmark button is located at the bottom right of the interface.

Variable Click to select a device and a variable. You can click the plus button to add more than one variable.

Message Here you can enter a JSON format message to send to the selected variables. It is important to enter a valid JSON object and worth getting to understand how this works as a more complex JSON message can be used in the scheduled events. The format must be as follows:

```
{"value": VALUE, "context": {"CONTEXTNAME": "CONTEXTVALUE"}}
```

To set the value of the variable simply replace VALUE with either a typed value or use the down arrow to include a custom field from the triggering event. So in its simplest form you may want to set the value of the variable to 10 so would enter:

```
{"value": 10}
```

Or if you wanted to include a value from the triggering scheduled event (Use the drop down arrow to add a custom value field):

```
{"value": inputData.value }
```

[Inserting custom value fields](#) will be explained further on in the manual.

The context is optional and allows text to be recorded against a variable's data point. These contexts (There can be any number you want) can be displayed using a Metric Widget or may appear in the various table widgets available. While primarily used for geo data, contexts can be a neat way of labelling data points.

For example, you may want to add a context called shift that shows which shift is active. The text would be supplied by the scheduled items.

```
{"value": Input data ", "context": {"shift": inputData.shift "}}
```

If you wanted to add more contexts separate the name and value pairs by a comma. Here we are adding a context named state and setting that to the value supplied by the schedule that triggered this action.

```
{ "value": "Input data", "context": { "shift": "inputData.shift", "state": "inputData.value" } }
```

Make sure that the context values are always enclosed in quotes as these are text based.



Click to complete this action.

Slack

This allows messages to be sent to the Slack messaging and collaboration platform. This is a little more complex to setup than other actions.

To configure Slack events from SensorSpace there is a little integration to do using the Incoming Webhook App which is powered by Slack. The Incoming Webhooks App is a simple way to post messages from SensorSpace into Slack. The webhooks make use of normal HTTP requests with a JSON payload.

Follow the simple steps below to configure your Slack events with SensorSpace and keep your office up-to-date and on-time.

If schedules

then actions

Incoming WebHook URL ⓘ

https://hooks.slack.com/services/T00000000/B00000000/XXXXXXXXXXXXXXXXXX

Bot icon ⓘ

Emoji

:gear:

To (Channel or User) ⓘ

#example-channel

Bot name ⓘ

matt

Message

Hey there, Trigger timestamp

From (Bot name)

Enter your username.

Type bot icon

Select either Emoji or Image.

Or, Bot icon emoji

Select the emoji to send.

To (Channel or user)

Enter the destination channel or user name.

With SensorSpace Slack Events your Apps can notify a #team or any @individual team member you need. To send events to team channels or an individual use the below structure, including the symbols. BE SURE TO SPELL EVERYTHING CORRECTLY.

Slack Event to a #Team Channel: **#ExampleTeamName**

Slack Event to a @Individual Team Member: **@ExampleIndividualName**

Webhook URL

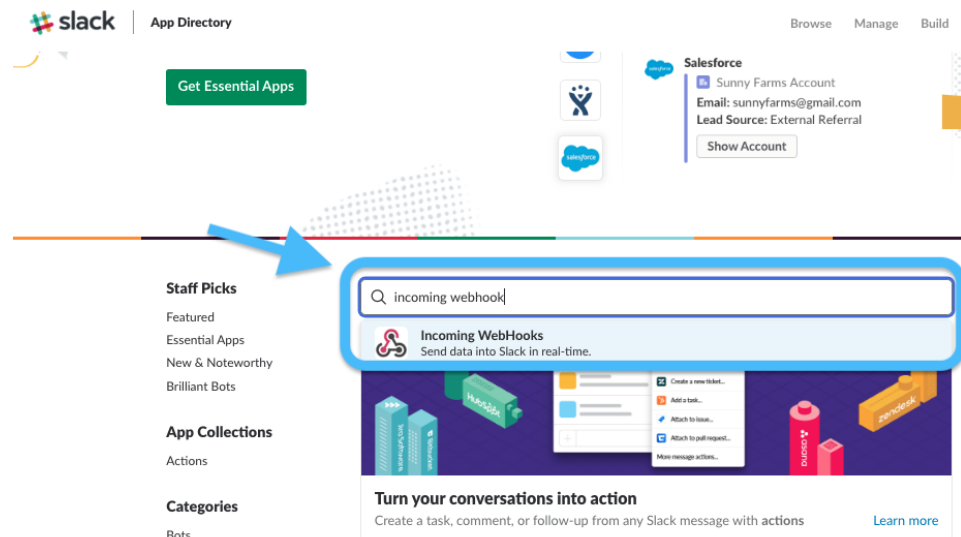
Enter the webhook URL.

To complete the configuration of the Slack event, you must locate the correct URL end-point of your private slack channel. Follow the simple steps below to locate the correct URL webhook endpoint so that your SensorSpace Slack Event can be delivered reliably to the correct Slack channel.

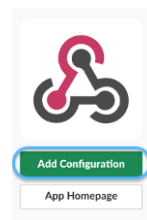
1. Access the Apps section of your Slack account and add the App "Incoming WebHooks" from the Slack App Directory.

The URL to access a team's Slack channel APPS is as follows:

```
https://CHANNEL_NAME.slack.com/apps
```

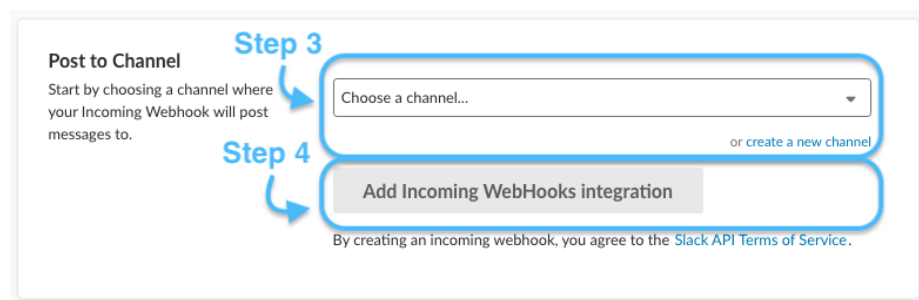


2. Next, create or "Add Configuration"



3. Create the Post to Channel URL by selecting which Slack Channel you would to reach, or create a new channel.

4. Then, "Add the Incoming Webhooks Integration"



5. Next, copy and paste the Webhook URL from Slack into the SensorSpace Event Setup.

Setup Instructions

We'll guide you through the steps necessary to configure an Incoming Webhook so you can start sending data to Slack.

close

Webhook URL

https://hooks.slack.com/services/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


Message

Enter the message. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. [Inserting custom value fields](#) will be explained further on in the manual.





Click to complete this action.

The new Slack action will then be added to the action list.



Slack message to #notifications

Hey there, {{variable.name}} was {{last_value}} at {{trigger_times...}}



Trigger Webhook

A webhook is a method of augmenting or altering the behaviour of a web page, or web application, with custom callbacks. These callbacks may be maintained, modified, and managed by third-party users and developers who may not necessarily be affiliated with the originating website or application.

HTTP Method This is the HTTP method with which the payload will be handled. The methods allowed by SensorSpace are: Get, Head, Delete, Post, Put, Patch

URL This is the server endpoint that will receive the webhook payload

Headers Certain headers may be required by the web service you are delivering into. You can add more headers and their associated value by clicking Add Header. A Content-Type header is already prefilled in and this is used to differentiate between payload data types. Webhooks would probably be delivered using one of the following content types but this will actually be determined by the destination service.

The **application/json** content type will deliver the JSON payload directly as the body of the POST.

The **application/x-www-form-urlencoded** content type will send the JSON payload as a form parameter called "**payload**".

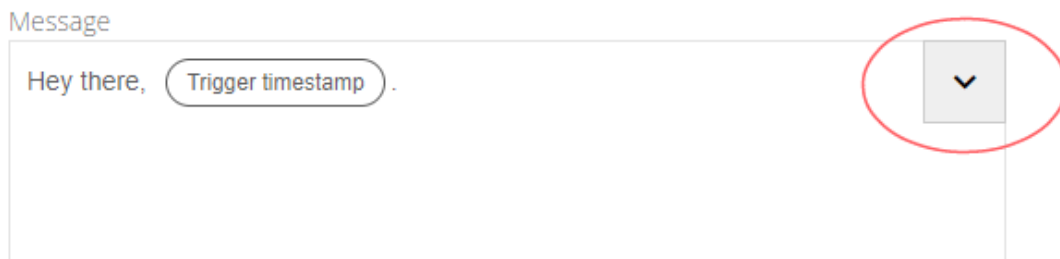
Body Enter the message. You can include references to values passed to the action by the triggered schedule event by clicking the down arrow. [Inserting custom value fields](#) will be explained further on in the manual. What is actually entered here will depend on the service you are hooking into. This may or may not be in JSON format.



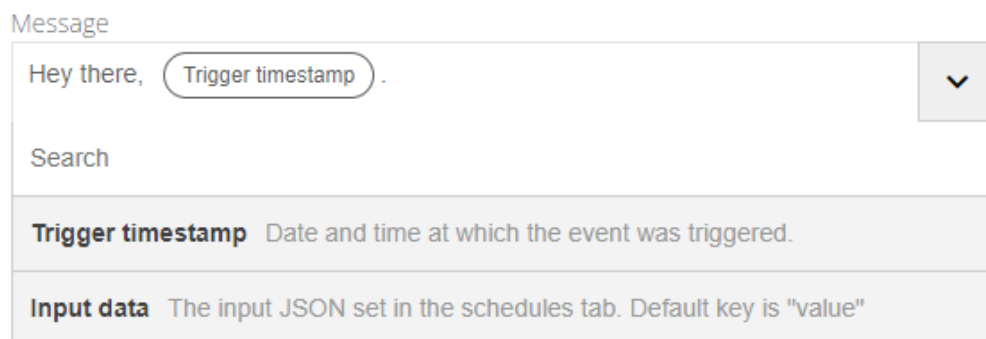
Click to complete this action.

Inserting Custom Value Fields

All of the action messages can contain references to keys defined by each of the scheduled events. To insert a custom value field place the cursor in the message text where you want the value to be inserted and click on the down arrow on the right.

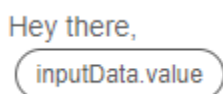


You can either select the item from the list (Click the down arrow next to the text edit field) to insert it into the message.



Trigger timestamp simply enters the date and time that the event was triggered. Input data is the powerful one here as this allows you to refer to keys written by each of the triggering scheduled event items.

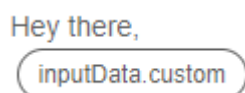
On selecting input data the field will be inserted into the message. This default one refers to the 'value' key which is one of the default keys presented when you first create a scheduled event item. However, this may have been deleted or you may have added more. To edit it just double-click on the field and it will expand like this:



This shows the default 'value' key. You can simply click and edit this value to select any of the key value pairs inserted by any of your scheduled event items. For example, if the scheduled events created a key named 'custom'

```
{"value":1,"custom":"morning"}
```

We can refer to this in the action messages by editing the custom field like this



Appendices

Appendix A – Security

Is SensorSpace Secure?

Security is important in all aspects of life - driving in a car, flying in a plane, uploading content to social media. The same is the case for your sensor data being sent to SensorSpace. SensorSpace is a streamlined platform designed for ease-of-use and quick deployment with security best practices built in along the way.

The software and hardware devices used to deliver data to SensorSpace use a combination of the security measures listed below.

Device Data Delivery

Software Devices

HTTP with SSL Encryption

HTTPS involves the use of an SSL certificate. "SSL" stands for secure sockets layer, which creates a secure encrypted connection between our servers and your devices. HTTPS helps us guarantee confidentiality, authenticity, and integrity.

Token in the HTTP headers

Software devices send their Security Token in the HTTP headers, using the "X-Auth-Token" HTTP header field to provide an added level of security.

Security Tokens are the unique allocated token to your device that identifies it and routes it's delivered data to the correct Organisation in SensorSpace.

Although we utilize HTTPS to ensure that all requests are encrypted for network transport, there is a possibility that the plain-text URL, with the value of the token, might appear in logs of HTTP servers which process the requests. Additionally, there are spyware exploits whereby certain browser extensions track and aggregate browsing behaviour and sell that data to third parties. No Authorisation data is held in the URL so avoiding unintentional exposure of your unique Security Token.

TCP Direct Socket Connection

Some software devices offer this option to deliver data. This method of data delivery is not encrypted but does have the advantage that there is very little data transferred and this option has been included for the specific reason of reducing data usage when using cellular access to the cloud and therefore reducing data usage of data limited SIM plans.

Usually, as this option would be chosen when the software is on a computer connected to a cellular modem then the connection between the modem and the cloud can be considered pretty private but the choice is there to use the more verbose but more secure HTTP option as stated above.

Hardware Devices

MQTT with TLS Encryption

Hardware devices use MQTT with TLS. SensorSpace supports the MQTT protocol, a lightweight publish/subscribe messaging transport optimized for IoT that supports TLS encryption. TLS (Transport Layer Security) provides a secure communication channel between a client and a server. Just like SSL, TLS is a cryptographic protocol that uses a handshake mechanism to create a secure connection between the client and the server. After the handshake is completed, an encrypted communication between client and server is established and no attacker could understand the content of the communication.

LAN Security

The hardware devices that connect to your LAN are also safe when it comes to looking at the security of your own local area network (LAN). The devices have no way of accessing your own network resources and simply use the LAN as a gateway to the Internet using DHCP and MQTT protocols.

There are no interfaces by which unauthorised users can gain access to your network via the hardware devices as only the T24 radio interface is exposed and this is incapable of allowing access to your LAN.

Customer API Use

If our APIs are used then the choice of API and choice of whether to support the security options made available becomes a matter of choice for the customer. If the customer chooses to ignore the supported security features such as TLS or SSL then that is beyond the control of SensorSpace.

We would recommend:

- Use SSL when using HTTP Rest API and use the security token in the headers rather than the URL.
- Use TLS when using MQTT.
- Avoid TCP or UDP Socket API if the network traffic is under risk of monitoring/sniffing.
- Keep your allocated Security Token safe and private.

Multi-AAA User Management

Authentication, authorization, and accounting (AAA) is a term used to describe a framework that successfully controls access to computer resources, enforcing policies, auditing usage, and providing the information necessary to bill for services.

SensorSpace plans allows you to gain control over who can access your device data at different levels: apps, customers and end-users.

Organisation Permissions: Set which devices, dashboards and users belong to a specific Organisation and can access it.

User Permissions: Add users to organisations, set passwords or revoke access when needed.

The final part in the AAA framework is accounting, which measures the resources a user consumes during access. This can include the amount of system time or the amount of data a user has sent and/or received during a session. Accounting is carried out by logging of session statistics and usage information and is used for authorization control, billing, trend analysis, resource utilization, and capacity planning activities.

SensorSpace has committed itself to being a safe place for your IoT development, exploration, and deployments. Using the best practices provided in this article and limiting access with SensorSpace Multi-AAA user management, you can ward off malicious intruders from your valuable insights.

Appendix B – Data Protection & Privacy Policy

SensorSpace is hosted by default on IBM's Toronto Datacentre. Working with renowned cloud providers help us minimize the risk of outages given their focus on reliability and uptime. IBM's cloud complies with more than 15 guidelines, including:

ISO 270001: a widely-adopted global security standard outlining the requirements for information security management systems and provides a systematic approach to managing company and customer information based on periodic risk assessments.

SAS 70: Statement on Auditing Standards (SAS) No. 70, is a widely recognized auditing standard developed by the American Institute of Certified Public Accountants (AICPA). It represents that a service organisation has been through an in-depth examination of their control objectives and control activities, which often include controls over information technology and related processes.

Privacy Policy

SensorSpace knows that you care how your information is used and shared, and we appreciate your trust that we do so carefully according to the following Privacy Policy to provide you with our SERVICE. This document is part of SensorSpace Terms of Service, and by using **sensorspace.com** and **api.sensorspace.com** (the "Site") you agree to the terms of this Privacy Policy and Terms of Service. You may be a third-party developer or manufacturer of a device that is enabled for and connected to our Service or an end user of an application powered by the Service containing the URL or CNAME relating to the User's Service. Please read the Terms of Service in their entirety, and refer to those for definitions and contacts.

By visiting the Site or using the Service, you consent to the collection, transfer, processing, disclosure, and other uses of your information described in this Privacy Policy.

SensorSpace collects anonymous and elected data from visitors and Users of the Site to monitor traffic and fix bugs, among other uses described below.

To take advantage of certain features of the Site, Users may elect to provide SensorSpace with other personal information (ie. user picture, personal website, or payment information), but user decision to do so is strictly voluntary.

Data Collected

SensorSpace may collect some, all, or none of the following information:

- Name, address, telephone number, business name, and email address
- Log-in credentials, if you create an account
- Information about purchases or other transactions with us
- Information about your customer service and technical support interactions with us
- Any other information you choose to provide to us in connection with your use of the Service

Automatically-Collected Information

If you visit the Site or are subscribed to and use our Service, the Service will collect information that relates to your use of the Service and may be utilized by 3rd party Service Providers including but not limited to providers of hosting services, email marketing platforms, payment processors, and security/fraud prevention companies submitted through the Site. These Service Providers may have access to your information for the limited purpose of providing the services we have contracted with them to provide.

The information that we and/or our service provider(s) collect is done by:

- **User Data** As with most websites and technology services delivered over the Internet, our servers automatically collect information when you access or use our Service and record it in log files. This log data may include your Internet Protocol (IP) address, device type and settings, hardware MAC address, device ID number, the address of the web page visited before using the Service, error logs, browser type and settings, the date and time the Services were used, information about browser configuration and plugins, and language preferences.
- **Location Data** We receive information from you that helps us approximate your location. We may, for example, use a business address submitted by your employer, or an IP address received from your browser to determine approximate location.
- **Device Data** We may receive information from your devices that help approximate your location or the location of an IoT device (hardware). This data, for example, may use GPS coordinates to identify a hardware location, or an IP address from a device to determine approximate location. We collect this location information from your devices in accordance with the consent process here within and the data provided by your IoT device to SensorSpace.
- **Cookies** In operating the Service or providing the Site, we and our service providers use Internet server logs, cookies, tags, SDKs, tracking pixels, and other similar tracking technologies. We use these technologies to offer you a more tailored experience by understanding and remembering your particular browsing preferences.

Users can block or delete cookies and still use SensorSpace. Please consult the Help section of your browser for more information (e.g. Internet Explorer; Google Chrome; Mozilla Firefox; or Apple Safari). Please note that by blocking, disabling, or managing any or all cookies, you may not have access to certain features or offerings of the Services.

SensorSpace only uses Users personal information to provide the User with SensorSpace services or to communicate with the User about service(s) or the Site. With respect to the any type of data user may choose to upload or visualize to/with SensorSpace, WE take the privacy and confidentiality of such data seriously, and store said data securely in renowned cloud providers such as, IBM Bluemix and employ industry standard techniques to protect against unauthorized access of data, including but not limited to User personal information. SensorSpace does not share personal information without your consent, unless:

- Doing so is appropriate to carry out Your own request;
- SensorSpace believes it's needed to enforce our Terms and Conditions of Service, or it is legally required;
- We believe it's needed to detect, prevent or address fraud, security or technical issues;
- To otherwise protect our property, legal rights, or that of others.

Data We Collect from Others

We may receive other information such as demographic and statistical information from SensorSpace powered services and third parties, such as business partners, marketers, researchers, analysts, User's service end-users, and other parties that we may attribute to you based on your assignment to certain statistical groups or Service usage. We use this information to supplement the information that we collect directly from you to derive your possible interests and to provide more relevant experiences for you with our Service and improve our products, analytics, and engagement.

Data That May Be Shared

SensorSpace may share information for the purposes referenced below:

We use external, 3rd party Service Providers to assist us in delivering the Service: these Service Providers may include but are not limited to providers of hosting services, email marketing platforms, payment processors, and security/fraud prevention companies submitted through the Site. These Service Providers may have access to your information for the limited purpose of providing the services we have contracted with them to provide.

Law Enforcement - SensorSpace may disclose your information if required to do so by law or in the good faith belief that such action is necessary to (i) comply with a legal obligation, (ii) protect and defend the rights or

property of SensorSpace and its affiliates, (iii) act in urgent circumstances to protect the personal safety of Users, Users of the Service, the Site, or the general public, (iv) to address fraud, security or technical issues; or (v) defend against legal liability.

In Connection With a Sale, Merger or Change of Control - In the event that SensorSpace undergoes a business transition, such as a merger, acquisition by another company, or sale of all or a portion of its assets, you agree that SensorSpace may transfer your information to the successor organization in such transition so that the Service can continue to operate. In the event of such transfer, your information would remain subject to the commitments contained in this Privacy Policy until such time as this Privacy Policy is updated or amended by the acquiring party upon notice to you.

SensorSpace also uses social buttons provided by services such as Twitter, Google+, LinkedIn, and Facebook. User use of these third-party platforms and services is entirely voluntary. SensorSpace is not responsible for the privacy policies and/or practices of these third-party services. Users are responsible for reading and understanding these third-party services' privacy policies and terms of service, not holding SensorSpace liable for any actions or communications when engaging with these social services.

You can visit the Site without providing any information that can directly identify you by name. In addition, if you are an end user and do not want to provide certain information to SensorSpace, you should not disclose it to the Integrator or manufacturer providing the SensorSpace powered Service. If you choose not to provide certain information, you may not be able to use certain features of the Service or parts of the Site. To keep your information accurate, current, and complete, please contact us as specified at the end of this Privacy Policy with any questions, comments, or updates. We will take all reasonable steps to update or correct information in our possession that you have previously submitted via our Service or Site.

Data Stored and Retained

Unless otherwise specified in a customer agreement or other written instructions provided by you, SensorSpace will keep your information for as long as is reasonably necessary for the purposes outlined in this Privacy Policy, or for the duration required by law, whichever is the longer.

European Union Data Compliance - GDPR Rights

This section applies to all Users, specifically if you are an individual located in the European Union or any jurisdiction in which the General Data Protection Regulation ("GDPR") (or a law or regulation implementing the General Data Protection Regulation 2016/679) ("EU Data Subject").

The EU General Data Protection Regulation (GDPR) went into effect on May 25th, 2018. Note, while GDPR is an EU regulation, it ultimately affects any business with customers in the EU which is why we are applying these changes globally, across all Users, regardless of where they may be.

Your Rights

For Personal Data that SensorSpace process as Service provider, you have the following rights in relation to your Personal Data, depending on the applicable law:

Right of access. If you ask SensorSpace, we will confirm whether we are processing your Personal Data and if so, provide you with a copy of that Personal Data (along with certain other details) that have been collected.

Right to rectification. If your Personal Data is inaccurate or incomplete, you are entitled to ask that we correct or complete it.

Right to erasure. You may ask SensorSpace to delete or remove your Personal Data.

Right to restrict processing. You may ask SensorSpace to restrict or block the processing of your Personal Data in certain circumstances, such as where you contest the accuracy of that Personal Data or object to SensorSpace processing it.

Right to data portability. You may have the right to obtain the Personal Data we process about you in a structured, commonly used and machine-readable format, and to reuse it elsewhere. This data may be received by written request or CSV download.

Right to object. You may ask SensorSpace at any time to stop processing your Personal Data, and we will do so, if we are:

1. relying on legitimate interests to process your Personal Data and we cannot otherwise demonstrate compelling legal grounds for the processing;
2. or processing your Personal Data for direct marketing.

Right to withdraw consent. If we rely on your consent as our legal basis for processing your Personal Data, you have the right to withdraw that consent at any time. This will not affect the lawfulness of processing based on your prior consent and will be applied in a timely fashion upon receiving a request to do so.

Right to lodge a complaint with the data protection authority. If you have a concern about any aspect of our privacy practices, including the way we have handled your Personal Data, you can report it to the data protection authority that is authorized to hear those concerns.

SensorSpace may amend this Privacy Policy at any time. Use of information SensorSpace collects is subject to the Privacy Policy in effect at the time such information is used or received by the Site. If SensorSpace makes any major changes to the manner or process of collecting or using information, SensorSpace will notify User by posting an announcement on the Site or sending User an email. A user is bound by any changes to the Privacy Policy when he or she uses the Services after such changes have been first posted and user notification sent.

Appendix C – Security Token

A Security Token will be required to achieve either of the following:

- Use a custom HTML Canvas widget to display data from or send data to the SensorSpace platform
- Use a remote system, web service, app, software or platform to connect to SensorSpace to read or write data.

Security tokens are linked to your own Organisation within SensorSpace so acts as a filter to ensure you only get access to your own data. (And likewise other users cannot get access to your data).

To receive a Security Token you will need to contact SensorSpace support. Tokens are linked to a particular Organisation but give access to all devices and variables within that organisation.

Contact SensorSpace support and let us know if you are working with the HTML Canvas widget or want to remotely access the SensorSpace platform and we will get the token to you in a secure manner (By SMS for example).



WARNING: If your Security Token is compromised, SensorSpace Administrators are required to revoke access using that key and to issue a new one. There may be a small administration fee charged for replacement or multiple Security Tokens.



NOTE: To use these features you will need to refer to the **SensorSpace Cloud Platform Technical Manual** which can be requested from your vendor.

Appendix D – Hex Colour Codes

The following table is a guide to the colour codes that can be entered when selecting variable colours for widgets.

Aliceblue #F0F8FF	Antiquewhite #FAEBD7	Aqua #00FFFF
Aquamarine #7FFFD4	Azure #F0FFFF	Beige #F5F5DC
Bisque #FFE4C4	Black #000000	Blanchedalmond #FFEBCD
Blue #0000FF	Blueviolet #8A2BE2	Brown #A52A2A
Burlywood #DEB887	Cadetblue #5F9EA0	Chartreuse #7FFF00
Chocolate #D2691E	Coral #FF7F50	Cornflowerblue #6495ED
Cornsilk #FFF8DC	Crimson #DC143C	Cyan #00FFFF
Darkblue #00008B	Darkcyan #008B8B	Darkgoldenrod #B8860B
Darkgray #A9A9A9	Darkgreen #006400	Darkkhaki #BDB76B
Darkmagenta #8B008B	Darkolivegreen #556B2F	Darkorange #FF8C00
Darkorchid #9932CC	Darkred #8B0000	Darksalmon #E9967A
Darkseagreen #8FBC8F	Darkslateblue #483D8B	Darkslategray #2F4F4F
Darkturquoise #00CED1	Darkviolet #9400D3	deeppink #FF1493
Deepskyblue #00BFFF	Dimgray #696969	Dodgerblue #1E90FF
Firebrick #B22222	Floralwhite #FFFAF0	Forestgreen #228B22
Fuchsia #FF00FF	Gainsboro #DCDCDC	Ghostwhite #F8F8FF
Gold #FFD700	Goldenrod #DAA520	Gray #808080
Green #008000	Greenyellow #ADFF2F	Honeydew #F0FFF0

Hotpink #FF69B4	Indianred #CD5C5C	Indigo #4B0082
Ivory #FFFFFF0	Khaki #F0E68C	Lavender #E6E6FA
Lavenderblush #FFF0F5	Lawngreen #7CFC00	Lemonchiffon #FFFACD
Lightblue #ADD8E6	Lightcoral #F08080	Lightcyan #E0FFFF
Lightgoldenrodyellow #FAFAD2	Lightgreen #90EE90	Lightgrey #D3D3D3
Lightpink #FFB6C1	Lightsalmon #FFA07A	Lightseagreen #20B2AA
Lightskyblue #87CEFA	Lightslategray #778899	Lightsteelblue #B0C4DE
Lightyellow #FFFFE0	Lime #00FF00	Limegreen #32CD32
Linen #FAF0E6	Magenta #FF00FF	Maroon #800000
Mediumaquamarine #66CDAA	Mediumblue #0000CD	Mediumorchid #BA55D3
Mediumpurple #9370D8	Mediumseagreen #3CB371	Mediumslateblue #7B68EE
Mediumspringgreen #00FA9A	Mediumturquoise #48D1CC	Mediumvioletred #C71585
Midnightblue #191970	Mintcream #F5FFFA	Mistyrose #FFE4E1
Moccasin #FFE4B5	Navajowhite #FFDEAD	Navy #000080
Oldlace #FDF5E6	Olive #808000	Olivedrab #688E23
Orange #FFA500	Orangered #FF4500	Orchid #DA70D6
Palegoldenrod #EEE8AA	Palegreen #98FB98	Paleturquoise #AFEEEE
Palevioletred #D87093	Papayawhip #FFEDD5	Peachpuff #FFDAB9
Peru #CD853F	Pink #FFC0CB	Plum #DDA0DD
Powderblue #B0E0E6	Purple #800080	Red #FF0000

Rosybrown #BC8F8F	Royalblue #4169E1	Saddlebrown #8B4513
Salmon #FA8072	Sandybrown #F4A460	Seagreen #2E8B57
Seashell #FFF5EE	Sienna #A0522D	Silver #C0C0C0
Skyblue #87CEEB	Slateblue #6A5ACD	Slategray #708090
Snow #FFFAFA	Springgreen #00FF7F	Steelblue #4682B4
Tan #D2B48C	Teal #008080	Thistle #D8BFD8
Tomato #FF6347	Turquoise #40E0D0	Violet #EE82EE
Wheat #F5DEB3	White #FFFFFF	Whitesmoke #F5F5F5
Yellow #FFFF00	YellowGreen #9ACD32	

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In the interests of continued product development, Mantracourt Electronics Limited reserves the right to alter product specifications without prior notice.



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