



# Saia PCD Supervisor EM



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## 0.1 Document History

Version	Changes	Published	Comments
ENG01	2020-08-20		First edition
ENG02	2021-03-19		Added new content:
ENG03	2021-05-03		Added new content EM 3.3

## 0.2 Trademarks

Saia PCD® is a registered trademark of Saia-Burgess Controls AG.

Technical changes are subject to the state of technology.

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# 1 Welcome

Welcome to Saia PCD Supervisor EM. The purpose of this document is to assist in engineering an Saia PCD Supervisor EM station, explaining the unique features and settings while advising on any tips and tricks to best utilise the software.



Saia PCD Supervisor EM has been developed and tested for Saia PCD version 4.4, 4.7, 4.8 & 4.9 Please note that Saia PCD Supervisor EM has been developed or tested for use with native Saia PCD.

## 2 Installation

To install Saia PCD Supervisor EM, follow the steps below. Prior to installation, ensure that the Saia PCD station and workbench are not running. Additionally, when Saia PCD Supervisor EM was purchased, download the modules from the partner web. In addition to the modules, a demo station will be provided.

1. Open the module folder received which contains Saia PCD Supervisor EM.
2. Navigate to the module folder for Saia PCD  
**C:\SBC\SaiaPCDSupervisor\modules**[Version number may differ].
3. Copy and paste the Saia PCD Supervisor EM modules into the Saia PCD Module folder.
4. Start Platform Daemon.
5. Restart Station
6. If CSV reporting is to be used, copy the templates into the station file space



To check that Saia PCD Supervisor EM has installed correctly, open the palette, search for Saia PCD Supervisor EM and the appropriate components should be listed.

Once these steps have been completed the Saia PCD Supervisor EM service needs to be added to your station from the Palette.



Saia PCD Supervisor EM works best when used in conjunction with a 64-bit Saia PCD Supervisor EM Installation. If you are using a 32-bit Saia PCD Supervisor EM installation it may be worth considering installation the 64-bit version. If this is not possible, please read the notes in the troubleshooting. guide.



Due to the differences between EnergyVision AX and Saia PCD Supervisor EM, it is not possible to automatically migrate one to the other. An AX station will need to be re-engineered with the new version of Saia PCD Supervisor EM.



### 3 Licensing

The Saia PCD Supervisor EM licensing model has changed to enable users to benefit from a Core tier and a Pro tier, differences in both can be seen in the table below:

	N4 EnergyManager Core	N4 EnergyManager Pro
Included usage	Free with limited features	All packages come with the full set of features
<b>FEATURES</b>		
Energy Benchmarking	✓	✓
Energy Ranking	✓	✓
Advanced Bar Charts	✓	✓
Contribution Analysis	✓	✓
Regression Analysis	✓	✓
Heat Map	✓	✓
Menu Builder	Limited to 10 menu items	Unlimited menu items
Instant reporting	Limited to PNG/PDF format	PNG/PDF + CSV & batch reporting
Kiosk Mode	Limited to 3 pages	Unlimited pages
Meter Aggregation	Limited to 3 histories	Subject to licence
Data Integrity	-	✓
Energy Temp Curve	-	✓
Tenant billing/Excel Reporting	-	✓
<p><b>GAIN VISIBILITY ON YOUR ENERGY TODAY</b>  <b>Contact us and start building</b></p>		

Figure 1 – Saia PCD Supervisor EM LICENSING TABLE

### 3.1 Saia PCD Supervisor EM Core

All Saia PCD Supervisor EM installations require a Core license. Chargeable new orders will receive a “Pro version” having the “Core License” included. For SBC, the Core license feature is added automatically. For demo installations with different brand IDs a Core License can be requested free of charge which is bound to the Host ID of your PC. You can request a “Core license” by sending the following details to your local Honeywell contact:

- Name of requestor
- Email address
- Telephone number
- Host ID

Once the core license is enabled on SAIA PCD Central you will need to update the license of the workbench. A core license enables you to run Saia PCD Supervisor EM with real data for 3 meters at no cost



Saia PCD Supervisor EM Core users can trial Saia PCD Supervisor EM Pro features for a 60-minute period. During this trial period data from aggregators is randomized. A trial can only be activated once without restarting the station.

### 3.2 Saia PCD Supervisor EM Pro

The Saia PCD Supervisor EM Pro package is scalable and provides:

1. License based on number of nodes. SAIA PCD SUPERVISOR EM licensing limits the number of **unique histories** that can be used within the SAIA PCD SUPERVISOR EM station.



The number of Aggregators you use is not limited by Saia PCD Supervisor EM licensing

Default features that are included

- All charts
- Menu Builder
- Data Integrity
- PDF and PDF batch Reporting
- Kiosk Mode
- Energy Temperature Curve
- Tenant Billing (Excel Reporting)

### 3.3 Checking your license status

It is possible to check how many **unique histories** are being used in the station, and how this corresponds to your licensed amount. Within workbench, load the **spy pages** view on the **Saia PCD Supervisor EM** . This will provide you with an overview of your licensing status

Meter Metrics	
Meter limit :	none
Number of unique meters :	17
Meter ORD's	Used
history:/EnergyVisionDemo/CampusPower	4
history:/EnergyVisionDemo/TeachingPowerMeter03	1
history:/EnergyVisionDemo/TeachingPowerMeter02	2
history:/History/CoolMeter	2
history:/EnergyVisionDemo/TeachingPowerMeter10	1
history:/EnergyVisionDemo/LibraryPowerMeter	2
history:/EnergyVisionDemo/TeachingPowerMeter	2
history:/EnergyVisionDemo/TeachingPowerMeter09	1
history:/EnergyVisionDemo/TeachingPowerMeter08	1
history:/EnergyVisionDemo/TeachingPowerMeter07	1
history:/EnergyVisionDemo/TeachingPowerMeter06	1
history:/H_W_CP132A/OustsideAirTemperature	1
history:/History/OAT1	4
history:/History/HeatMeter	2
history:/H_W_CP14a/LTHWHeatMeter	2
history:/EnergyVisionDemo/TeachingPowerMeter05	1
history:/EnergyVisionDemo/TeachingPowerMeter04	1

Figure 2 - EXAMPLE OVERVIEW OF LICENSE STATUS

## 4 Saia PCD Supervisor EM Aggregators

The aggregator is at the core of SAIA PCD SUPERVISOR EM, connecting history data sources to the charts.

An aggregator is a virtual representation of a physical meter in the field. Aggregators also have the option to add external data from a file.

Aggregators normalise data of one or more meters into a 'virtual' meter. For example, 4 sub-meters in the field can be merged into 1 SAIA PCD SUPERVISOR EM aggregator representing a floor. Another example would be subtracting renewable from non-renewables.



Each Aggregator can be made up of up to 50 histories.



Removing histories will permanently delete the stored data in the ENERGY MANAGER database..

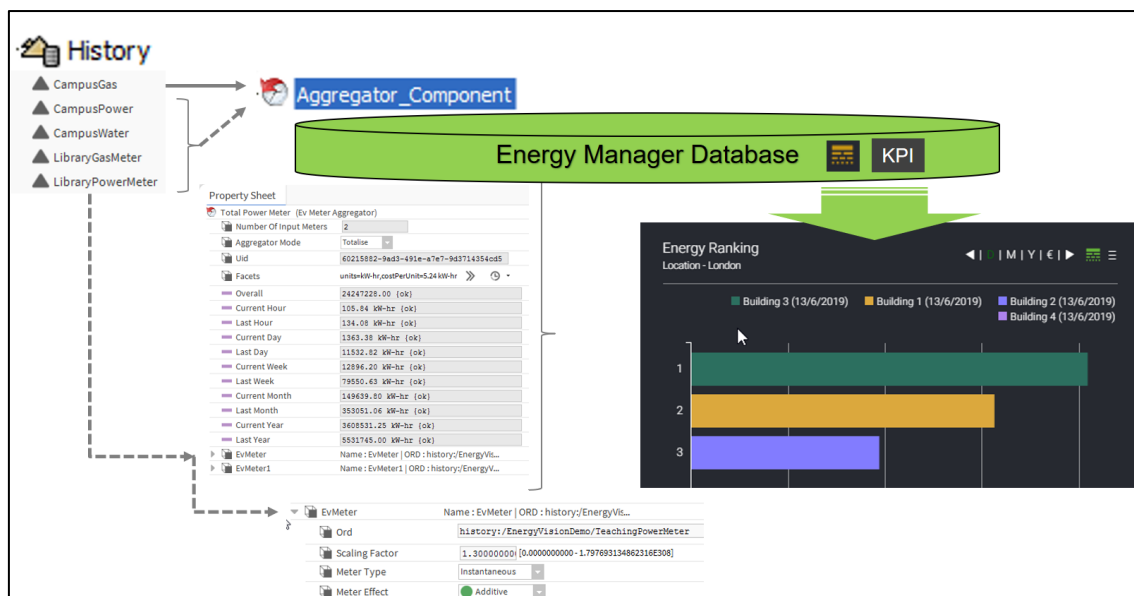


Figure 3 - METER AGGREGATOR OVERVIEW

### 4.1 Creating Aggregators

There are two main ways of configuring and creating aggregators in SAIA PCD SUPERVISOR EM.

1. Manually adding histories to an aggregator
2. By creating the aggregators using the Site Hierarchy

## 4.2 Manually adding histories to aggregators

This method is particularly useful when the user is adding a small number of meters to one page.

1. Open folder in which the aggregator needs to be added.
  - a. Right Click on the folder and select Views > Wire Sheet.
2. Open the **Palette** ensuring that the **SAIA PCD SUPERVISOR EM Palette** is opened.
3. Expand the folder Aggregator.
4. Drag & drop the Aggregator component onto the Wire Sheet.
5. Double click on the Aggregator component.
6. Right-click on the property sheet, select Actions > Add Meters.
7. Enter the number of Meters that need to be added.
8. Click OK.
9. Respective to the number of Meters added in step 7, Meter (1,2,3 etc....) will be added.
10. Expand Meter.
11. The Ord line will display null.
12. Click the drop-down icon next to the folder icon.
13. Select History Ord Chooser.
14. Using the pop-up, navigate through your histories selecting the appropriate file.
15. Once selected, click Ok.
16. To add further, repeat steps 10, 11, 12 (a), 13 & 14.

## 4.3 Site Hierarchy

The Task of "Site Hierarchy" is to simplify the creation of an aggregator and its assigned histories.



As a pre-requisite to using the Site Hierarchy function, it is assumed that the folder structure for the station has already been created. We would **STRONGLY recommend** that folders have already been created as this makes bringing in histories easier, allowing the engineer to see the hierarchy of the station.

## 4.4 Discovering histories using Site Hierarchy

1. **Expand** the station in the **Navbar**
2. **Expand** Config → Services → SAIA PCD SUPERVISOR EM
3. Double Click on Site Hierarchy
4. Now, a new window will have appeared. (This may take a minute or 2 to open depending on the number of histories within the station).
  - a. **Station** – This window is the complete hierarchy of the station.
  - b. **Discovered** – Shows the history structure
  - c. If no histories have been discovered yet, at the bottom of the window click **Discover**. This will now search the network for any histories.
  - d. **Current Path: Slot:/** - This window is the folder structure of the station. This is where the aggregators will be added too.
  - e. **Site Meter Tree** – Once aggregators have been created, they will show in the site meter tree.
5. Using the **Discovered** window, navigate through the histories.

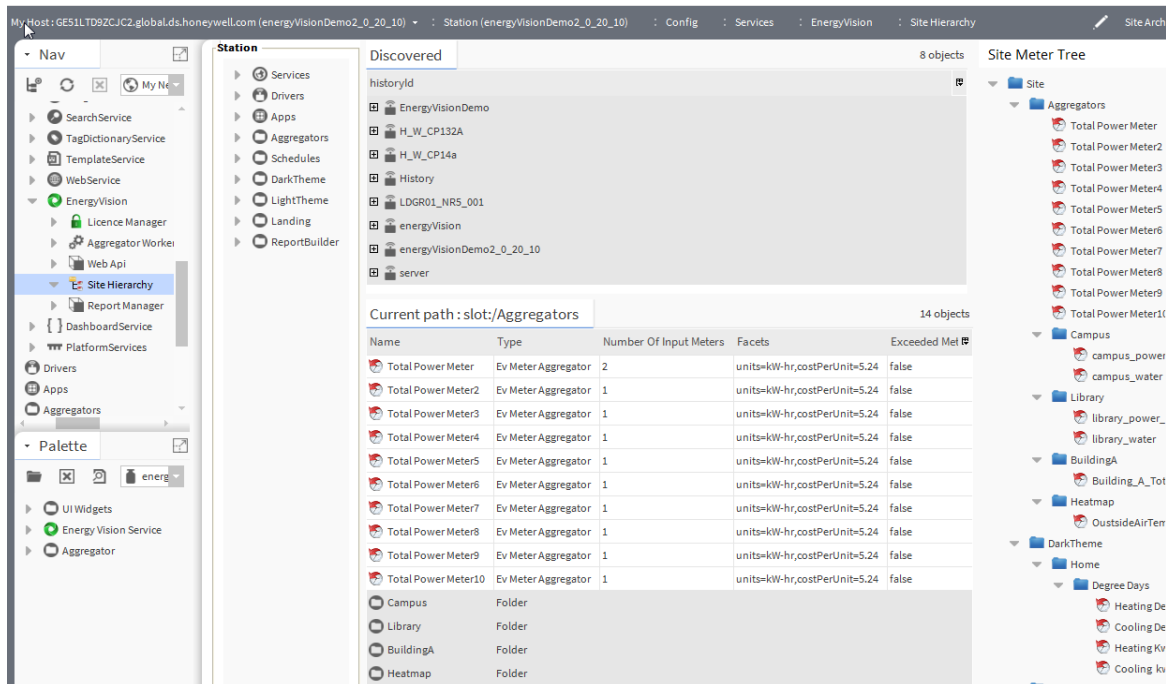


Figure 4 - EXAMPLE OF SITE HIERARCHY

## 4.5 Adding Histories to Aggregators Using Site Hierarchy

Now that histories have been discovered, it is now possible to assign histories to an aggregator

### Assign Single History to an Aggregator

1. To bring in a **single history**, ensure the folder that the meter will be added to is open in the **Current Path** window below. This is where the aggregator will be added too.
2. Select the **History**.
3. At the bottom of the window, click Add.
4. A pop-up window will now appear. Rename the aggregator if needed; if not, the aggregator will be named after the history it is being linked too.
5. The aggregator, with the history linked to it, will now be added to the folder opened in the Current Path window.
6. To add further single histories, repeat steps 1, 2, 3 & 4.

### 4.5.1 Assign Multiple Histories to an Aggregator

1. To bring in **multiple histories**, ensure the folder that the meter will be added to is open in the **Current Path** window below. This is where the aggregator will be added too.
2. Select the **Histories**.
3. At the bottom of the window, click **Add Group**.
4. A pop-up window will now appear. Rename the aggregator if needed; if not, the aggregator will be named after the history it is being linked too.
5. The aggregator, with the history linked to it, will now be added to the folder opened in the **Current Path** window.
6. To add further histories repeat steps **1, 2, 3 & 4**



It is paramount that the naming of your aggregators is kept relevant in the initial engineering stage. This is due to the fact the charts/graphs/dials/gauges all pull the name of the aggregator through and will be on display. For example, we would **STRONGLY recommend NOT** naming aggregators *Meter 1, Meter 2, etc...* rather call them something like, *Floor 1, Room 2, etc.* ensuring that they remain specific to data they are processing.

## 4.6 Data Normalisation

Data normalisation can be used to normalise aggregator output to calculate metrics such as “power consumption by area”, “power consumption per employee”. Data Normalisation is the process of applying a scalar operation (add, subtract, divide, multiply) to an aggregators output. The normalisation is applied as the final stage in an aggregator’s calculation. If more than one normaliser component is present the normalisation steps would be applied by their order in the slot sheet.

### 4.6.1 Adding a normalisation step:

- Right-click on normaliser and choose the type of normalisation
- Set the operand value and the corresponding unit.

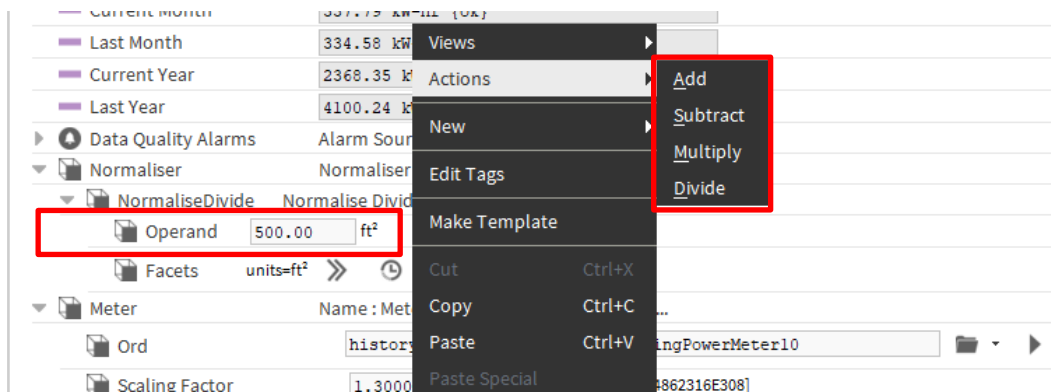


Figure 5 - EXAMPLE OF ADDING A NORMALISATION STEP

4.6.1.1 Derived Unit:

The unit property on the aggregator is a derived unit based on the base history units and the normaliser units.

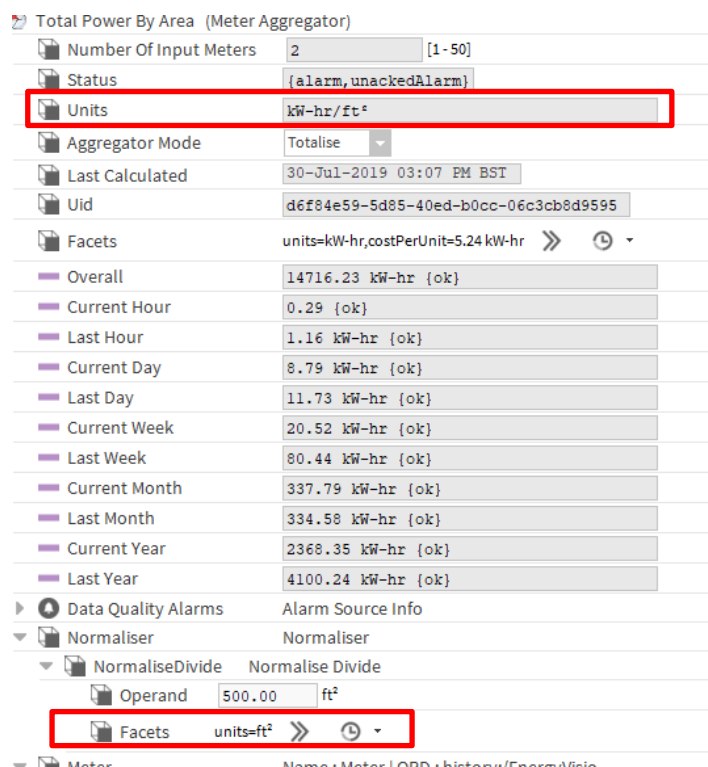


Figure 6 - EXAMPLE OF A DERIVED UNIT

4.7 Aggregator Mode

Aggregation mode determines how two meters vales can be combined. The available modes are

- Totalise – when more than one meter is present in an aggregator, the values from meters will be added together. Eg:- An aggregator with three sub meter history can be totaled to derive a main meter reading.



- Average – When more than one meter is present in an aggregator, the average of all meter values will be calculated. Eg:- Average of two external air temperature sensors.

## 4.8 Aggregator Facets

The ‘Aggregator Facet’ is the facet that is used on the aggregator output value and will be displayed in the charts. When adding multiple history files, the aggregator engineering unit must be modified manually. This is achieved by configuring the facets of the Aggregator. In the same dialog, the cost per unit can be configured. This is used when displaying reports based on cost conversion (for more details please see **Reporting** section of this manual).

### To manually add a facet

1. Open the Aggregator Property Sheet
2. Click the >> icon in the Facets Property
3. Configure the Units Property
4. Configure the costPerUnit Property

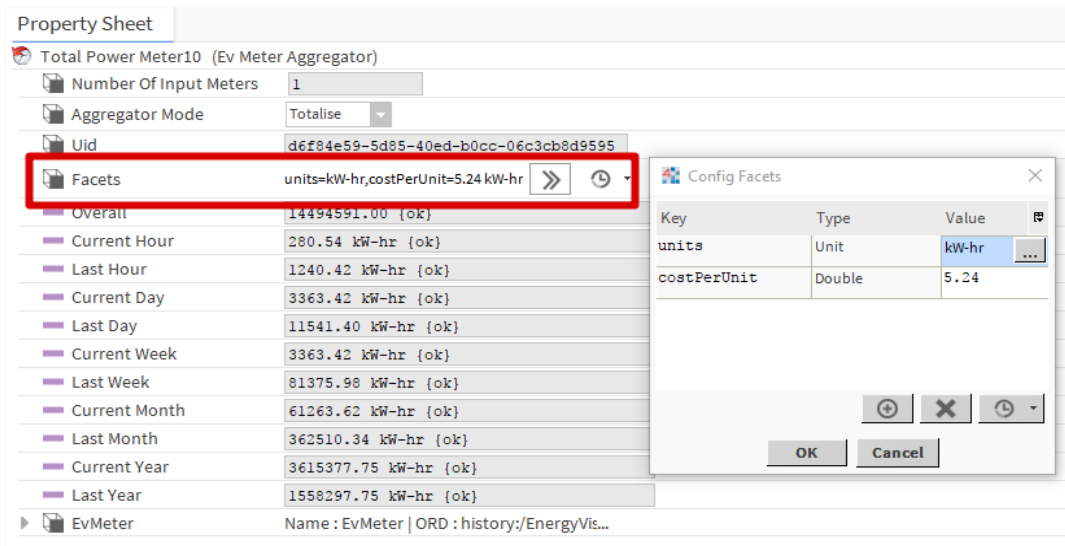


Figure 7 - EXAMPLE OF A FACET

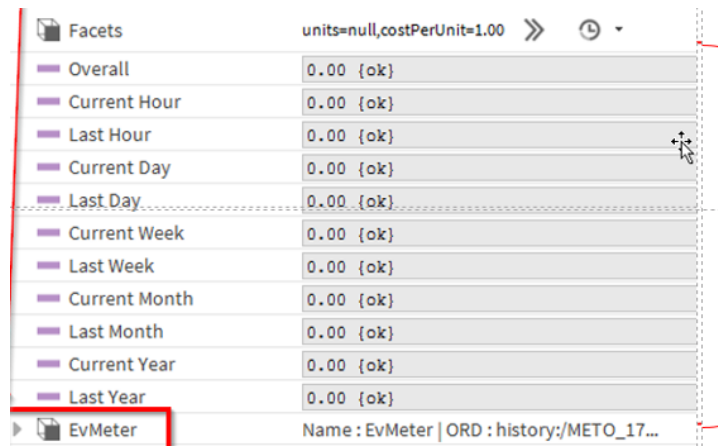


Units for an Aggregator is taken automatically from the assigned history file.

### 4.9 Calculated values

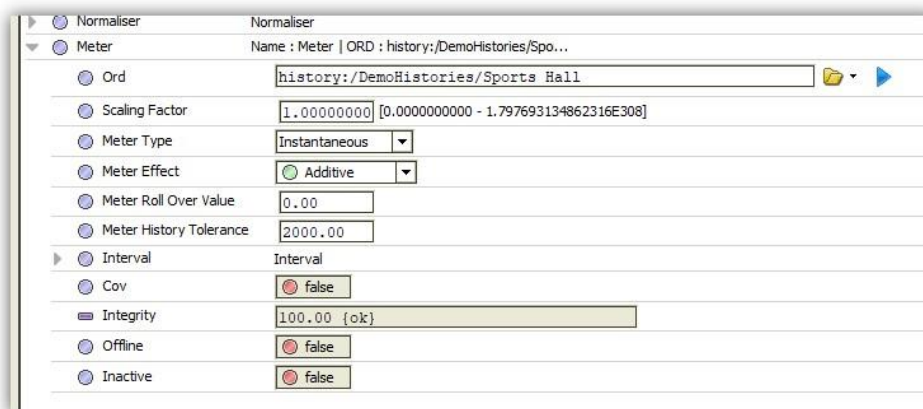
Results for different timeperiods are calculated by the aggregator on every calculation cycle. Calculations can be triggered manually by triggering the execute action. The default time frames for the calculation are as show in the figure.

If there are values missing for instantaneous meters, a 0 would be used in its place. For a cumulative meter, the previous value would be used to calculate the delta once the next values are recorded. There is no data interpolated should there be gaps in the data.



### 4.10 Setting up Meters

A meter component describes a data source, its characteristics and offers options to configure how to process the data source.



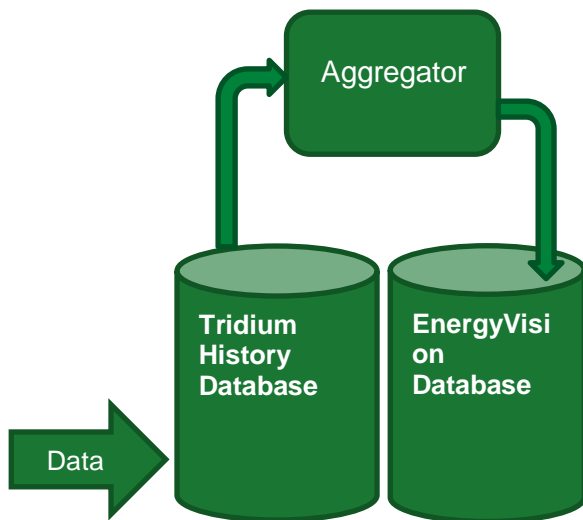
**Figure 8 - EXAMPLE AGGREGATOR SET UP**

1. ORD - SAIA PCD History Ord - The Ord of the SAIA PCD history, to be used as the data source.
2. Scaling Factor – A multiplication factor for the history value before it is fed into the aggregator.
3. Meter Type
  - a. Instantaneous – The data series which is not accumulated over time. Eg:- temperature, frequency
  - b. Accumulative -- The data series is a summation of the previous values (always increasing except for meter rollover). Eg:- kWhr

4. Meter Effect – only applicable when more than one meter is used
  - a. Additive – the values from this meter will have an additive effect on the result.  
Eg:- floor1 meter +(Additive) floor2 meter = sum of floor1 and floor 2
  - b. Subtractive – The values from this will be removed from the total. Eg:- total power consumption meter – (subtractive) solar power production meter = total non-solar consumption
5. Meter Roll Over Value –
  - a. Only applicable for accumulative meter
  - b. During meter rollover, the delta is calculated as follows
    - $\text{delta} = (\text{rollover} - \text{previousValue}) + \text{currentValue}$
6. Meter History Tolerance
  - a. A threshold-based method to remove erroneous values
  - b. Any values greater than the threshold will be ignored. **if  $\text{abs}(\text{value}) > \text{threshold}$**  resulting value is dropped.
7. Interval - The auto detected history interval. This interval is used for data quality calculations.
8. COV – is the history type **change of value**
9. Integrity – Data Integrity of the input history (number of available records/ no of expected records).
10. Offline - if offline currently – no reading for last two data collection cycles
11. Inactive - If the last 20 readings in history are the same then it's considered inactive

## 5 File Structure

Working alongside the in-built Tridium database, SAIA PCD SUPERVISOR EM's new proprietary format database is highly compressed and streamlined for optimum performance. Below is a graphical representation of the new database structure.



In the chart to the left is a representation of how the data is brought into SAIA PCD SUPERVISOR EM.

1. Data enters the Tridium history database.
2. Data is processed using aggregators.
3. The aggregator adds a copy of that history into SAIA PCD SUPERVISOR EM's database.
4. The chart will always access the history created by the aggregator in the SAIA PCD SUPERVISOR EM database.

### 5.1 Saia PCD Supervisor EM Planning

Planning your Saia PCD Supervisor EM system set up prior to starting is essential for a later operation.

1. Saia PCD Supervisor EM uses the default SAIA PCD mechanisms that are based on absolute orders. It is therefore important to build up a good folder structure for aggregators and graphics.
2. Some Saia PCD Supervisor EM functions can only be used in Workbench or the Web Browser. The user will be prompted contextually when a feature is not accessible on a platform.

### 5.2 Recommended Browser

The display of graphics can vary between web browsers. Saia PCD Supervisor EM is tested using the latest version of Google Chrome so for the best results we recommend using **Google Chrome**.

### 5.3 Accessing Saia PCD Supervisor EM via a Web Browser

As with all SAIA PCD Stations, it is possible to view your station via a web browser. Some features of Saia PCD Supervisor EM are only available when accessed in a web browser and are unavailable in workbench. (There will be a clear indication when this is the case). Below are some steps to ensure that your station will be accessible via a web browser.

1. Ensure the station is running in Saia PCD. (Platform > Application Director > [STATION NAME] running.
  - a. If it isn't running, click Start in the controls pane below.
2. Allow the station time to start running. Usually 2 minutes (depending on the size of the station).
3. Now, open the web browser.
4. Type: **localhost** – into the browser
  - a. If the port on which the station is running hasn't been changed the default port number is 80. If the port number has been changed manually, for example, to port 81, type: localhost:81.
5. A login window should now appear.
  - a. Enter the station's credentials.  
The station should now be loaded within the web browser.

**To change and/or check the port on which the station is running, follow the below instructions:**

1. Ensure the station is connected.
2. Expand the station  Config  Services
3. Double click on Web Service.
4. Check HTTP(S) Port numbers. This will determine which port to access the station.



Ensure the latest version of Google Chrome is installed on the Server (where the Saia PCD Supervisor EM station is running). This is critical to report generation.

## 6 Saia PCD Supervisor EM Charts Overview

Saia PCD Supervisor EM provides pre-defined chart components with individual functions, using a common design. All charts support HTML5 and will resize based on the Web Browser used. Charts can choose from a number of set intervals, Year, Month, Day and Weekly. For Weekly intervals, the starting and ideal ranges can be set by the operator for comparison.

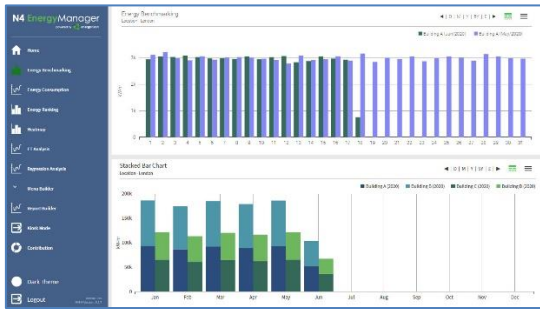


Figure 10 - EXAMPLE BAR/STACKED BAR CHART

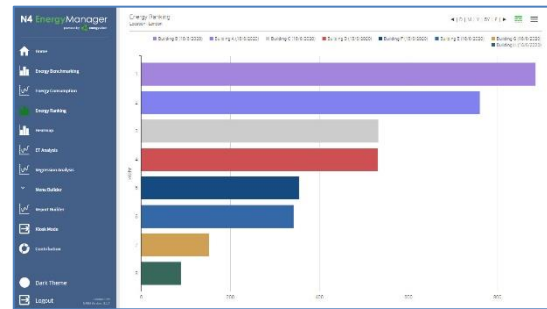


Figure 9 - EXAMPLE ENERGY RANKING CHART

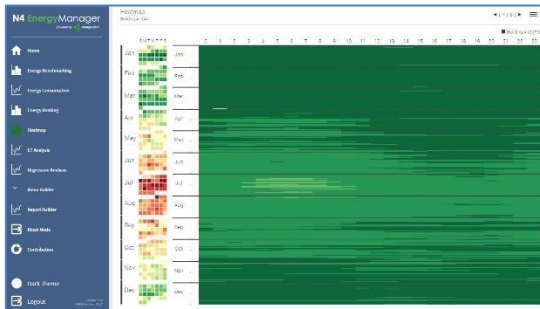


Figure 11 - EXAMPLE HEAT MAP CHART

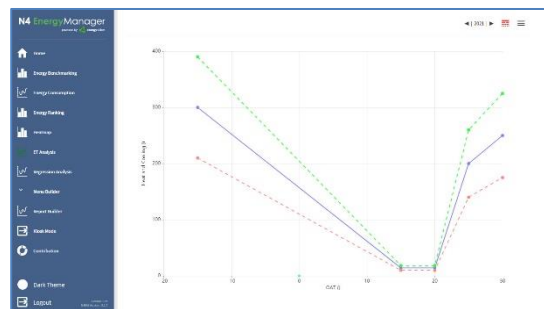


Figure 12 - EXAMPLE ET ANALYSIS

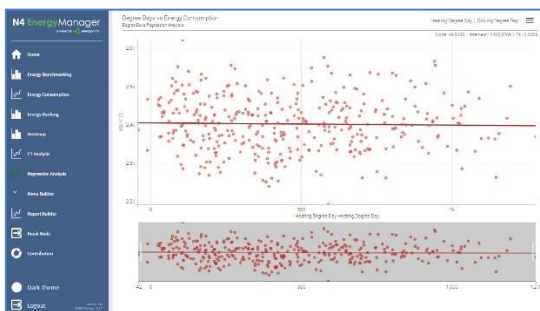


Figure 13 - EXAMPLE DEGREE DAY REGRESSION CHART

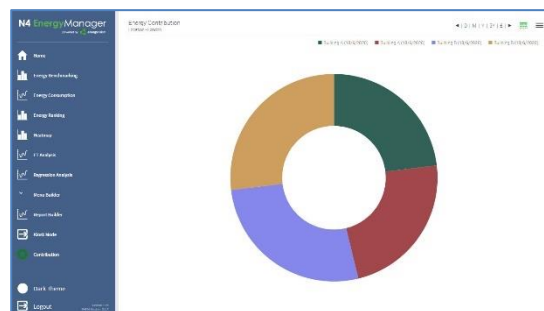


Figure 14 - EXAMPLE ENERGY CONTRIBUTION PIE CHART



Figure 15 - EXAMPLE LINE CHART & GAUGES

## 6.1 Common chart properties

Saia PCD Supervisor EM provides default chart templates for faster engineering & intuitive operation. The common features are:

### Chart Headings

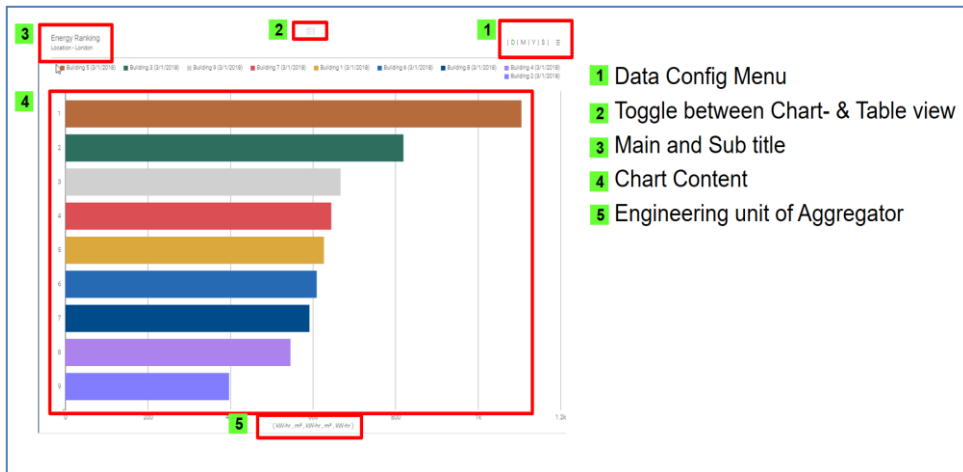


Figure 16 - EXAMPLE CHART HEADINGS

### Burger Menu

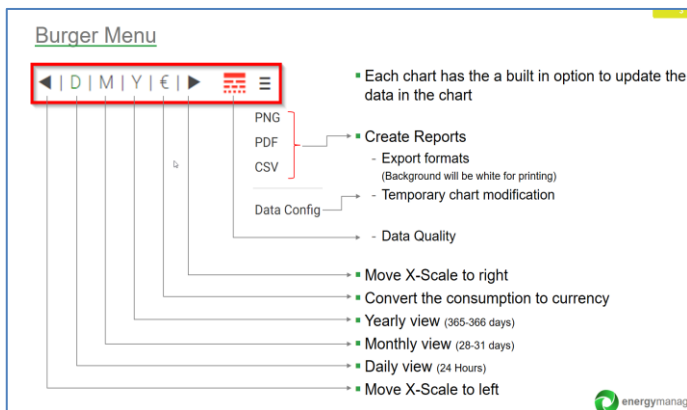


Figure 17 -BURGER MENU EXPLANATION

### Data Quality

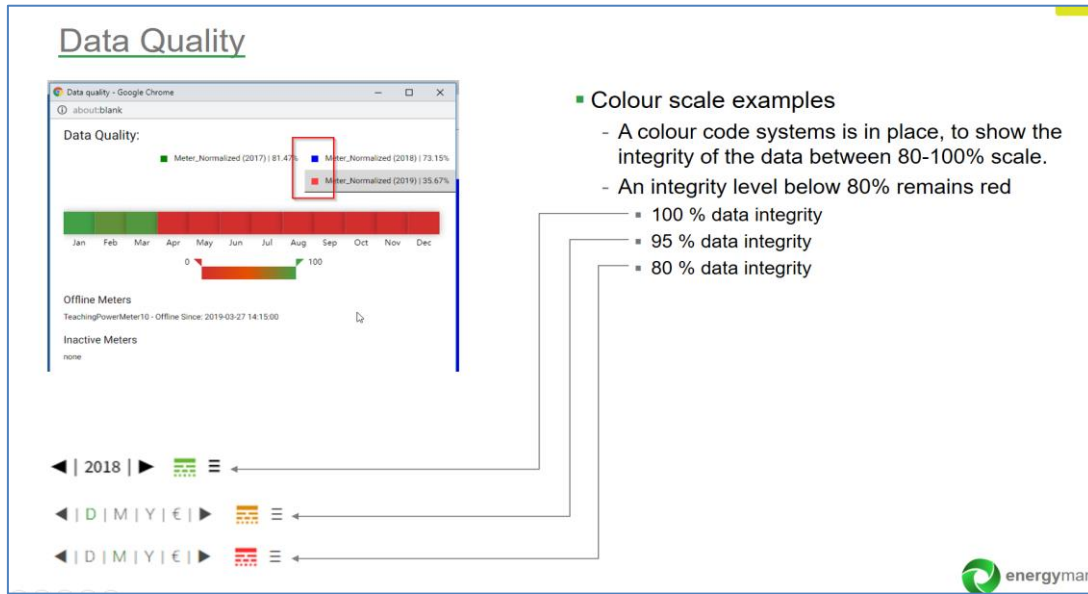


Figure 18 - DATA QUALITY ICON EXPLANATION

Chart & Table View

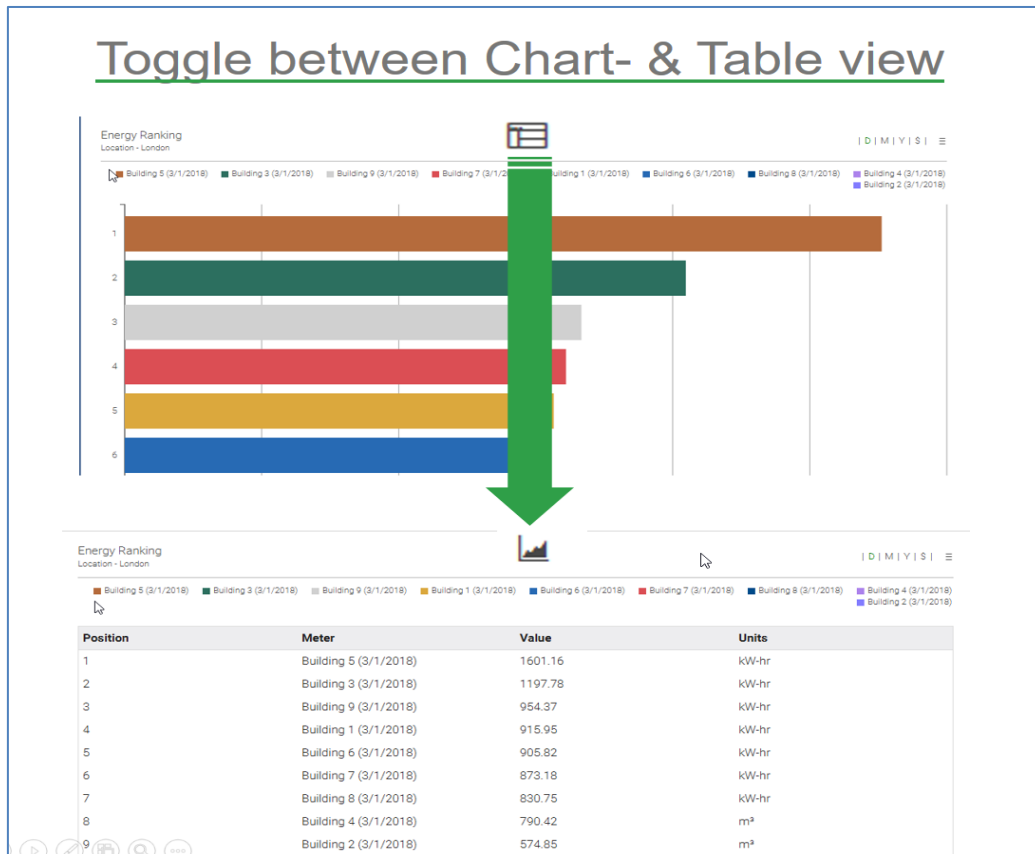


Figure 19 - EXAMPLE CHART & TABLE VIEW

Chart Properties



### Chart Properties

- Open graphic in edit mode to access the chart properties
- All properties are listed in the lower right corner
- For all charts the properties are similar
- Common properties are
  - backgroundColour
    - Graphic background colour
  - chartSubTitle
    - The subtitle of the chart
  - chart Title
    - The title of the chart
  - Enabled
    - Enables / disables the chart
  - foregroundColour
    - Covers the text and the chart outline

Figure 20 – (a) EXAMPLE CHART PROPERTIES

### Chart Properties

- js
  - NA (Tridium feature)
- layer
  - Defines the layer of the chart (optional)
- layout
  - Chart will be auto resized fitting to the layout setting
  - Chart width & height
  - Position of X-Axis & Y-Axis of the chart
- timeRange
  - defines the default time range loading the chart
- visible
  - Show- / hide chart

Figure 21 - (b) EXAMPLE CHART PROPERTIES

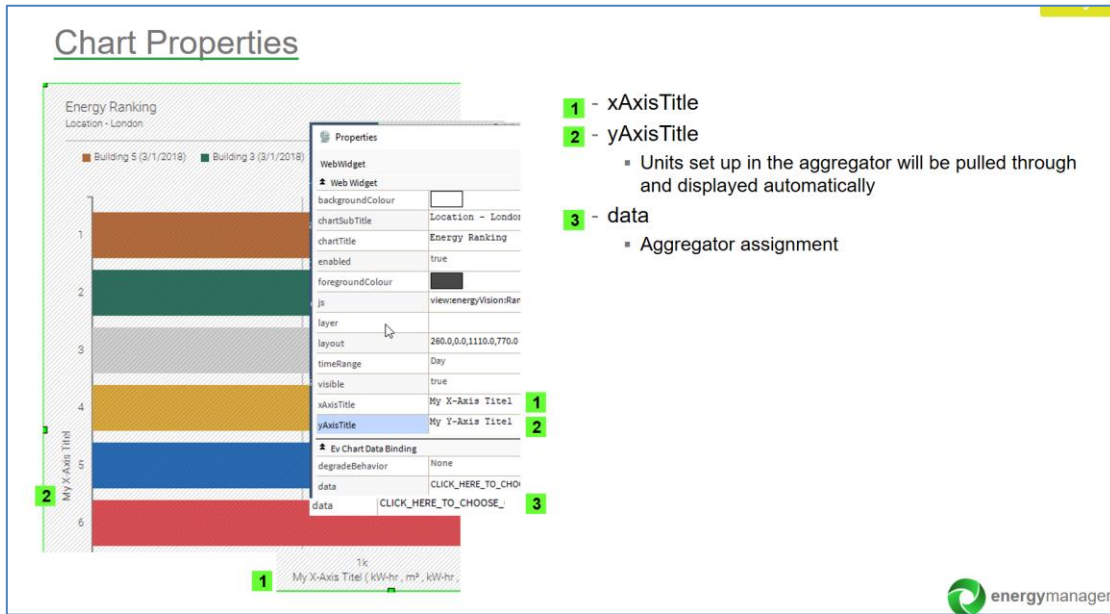


Figure 22 - (c) EXAMPLE CHART PROPERTIES

Data Binding

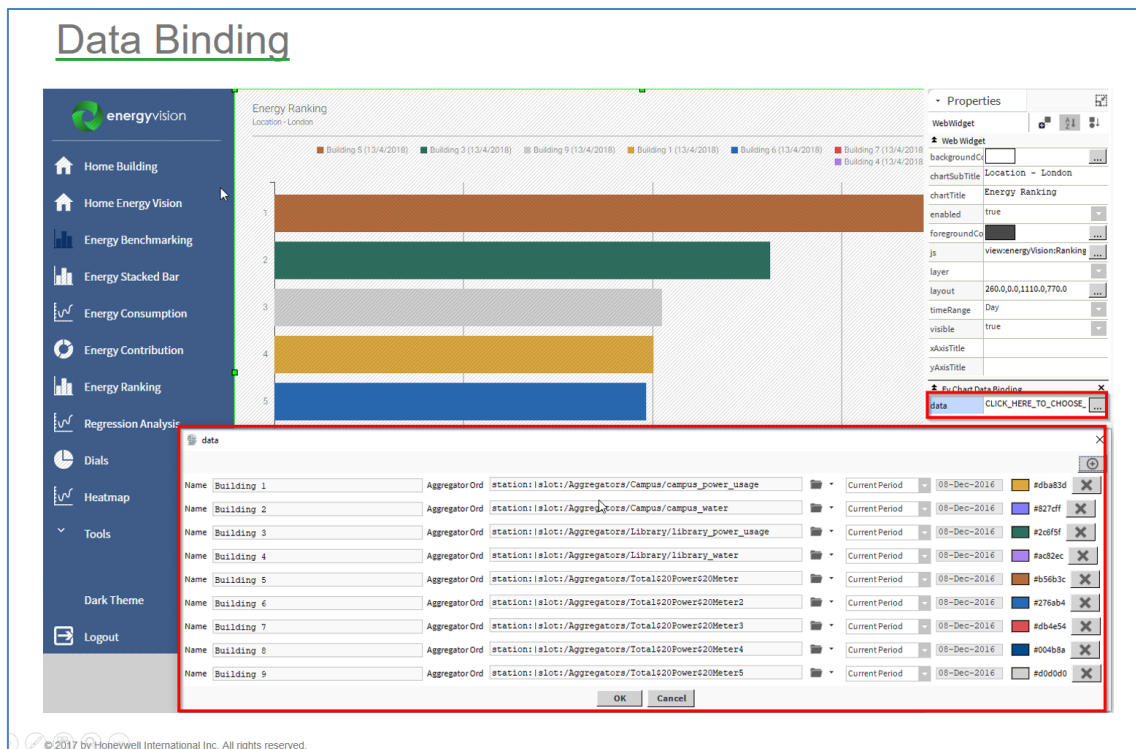


Figure 23 - EXAMPLE DATA BINDING VIEW

### Data Binding

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Name Building 1	AggregatorOrd station:/slot/Aggregators/Campus/campus_power_usage	Current Period	08-Dec-2016	#d8a83d
Name Building 2	AggregatorOrd station:/slot/Aggregators/Campus/campus_water	Custom	08-Dec-2016	#827dff
Name Building 3	AggregatorOrd station:/slot/Aggregators/Library/library_power_usage	Last Period	08-Dec-2016	#2e6f5f
		Current Period	08-Dec-2016	#2e6f5f

- 1** - Alias for Aggregator
- 2** - Path of Aggregator Ord
- 3** - Value display period
  - Time Range + time Period = Query date time range
    - Day + current period = Today
    - Day + last period = Yesterday
    - Day + custom period = any custom date
  - Month + current period = Current month
  - Month + last period = Last month
  - Month + custom period = any custom month
- 4** - Color assignment (can be customized)
- 5** - To add further aggregators
- 6** - Remove item form list




Figure 24 - DATA BINDING HEADINGS

## 7 Saia PCD Supervisor EM Charts

### 7.1 Line Chart

The Line Chart displays aggregator values as a series of points connected by straight lines. A line chart is normally used to show the trend of data over time.



By enabling **Multiple Y Axis** in the Line Chart Property tab, multiple Y Axis will be drawn for each unique facet found in the Aggregators assigned to the chart.

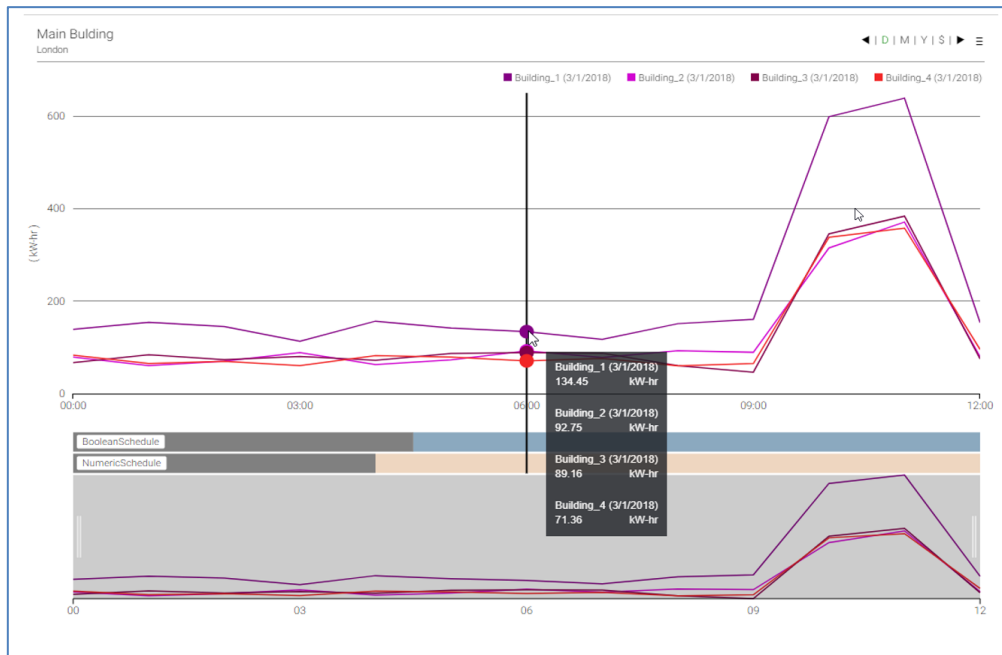


Figure 25 -EXAMPLE LINE CHART

### Line Chart

▪ Line Chart options:

- 1 - Chart content
  - The Line Chart displays aggregator values as a series of points connected by straight lines
  - It shows the trend of data over time
- 2 - Schedule
  - Adds a schedule as a bar below the line chart
  - Temporary configuration via "Burger Menu"
- 3 - Minimap
  - To zoom Chart content

### Line Chart – How To implement

- Add Line Chart to graphic
  - Open Graphic in “Edit Mode”
  - Open “Energy Vision” Palette
  - Drag & Drop Line Chart to graphic
  - Adjust the Line Chart size
  - Configure Line Chart properties
    - 1 = Background Color
    - 2 = Chart (Sub) Title
    - 3 = timeRange
    - 4 = Optional add x- / y Axis Title
    - 5 = Add Aggregator to chart
    - 6 = Save graphic

## 7.2 Bar Chart

The bar chart represents the value of the aggregators assigned to it, by the height of bars. This chart is commonly used to show comparisons between different categories of data.

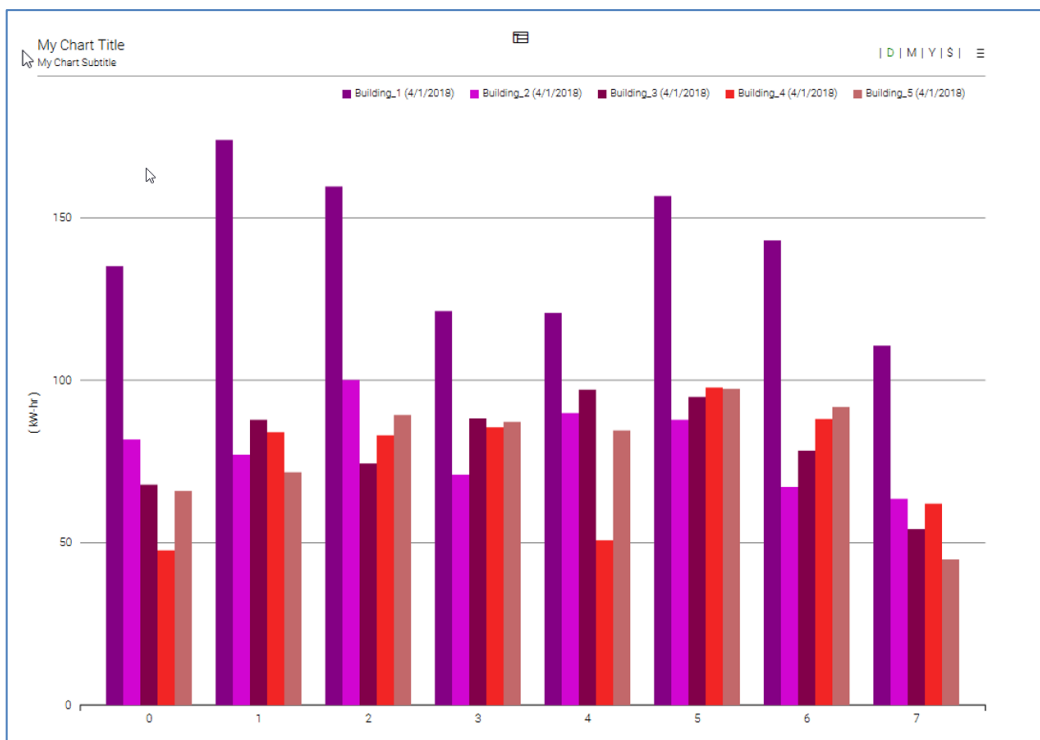


Figure 26 - EXAMPLE BAR CHART

### Bar Chart

- Bar Chart options:
  - Consumption in same period
    - Benchmark consumption of different aggregators
  - Consumption against previous period
    - Benchmark consumption against previous period
  - Consumption against customized period
    - Benchmark consumption against a fix period
    - e.g. against ideal day, month or year

### Bar Chart – How To implement

- 1 backgroundCo
- 2 chartSubTitle
- 3 timeRange
- 4 xAxisTitle
- 5 data

- Add Bar Chart to graphic
  - Open Graphic in “Edit Mode”
  - Open “Energy Vision” Palette
  - Drag & Drop Bar Chart to graphic
  - Adjust the Bar Chart size
  - Configure Bar Chart properties
    - 1 Background Color
    - 2 Chart (Sub) Title
    - 3 timeRange
    - 4 Optional add x- / y Axis Title
    - 5 Add Aggregator to chart
    - 6 Save graphic

### 7.3 Ranking Chart

The Ranking Chart displays the value of each aggregator assigned to it as a horizontal bar chart. These values are then ranked into order from highest to lowest. This could be used to rank energy usage across multiple sites, ranked to show the most efficient/inefficient.



There is no limit on the number of aggregators that can be added to a Ranking Chart. However, large numbers may reduce performance.

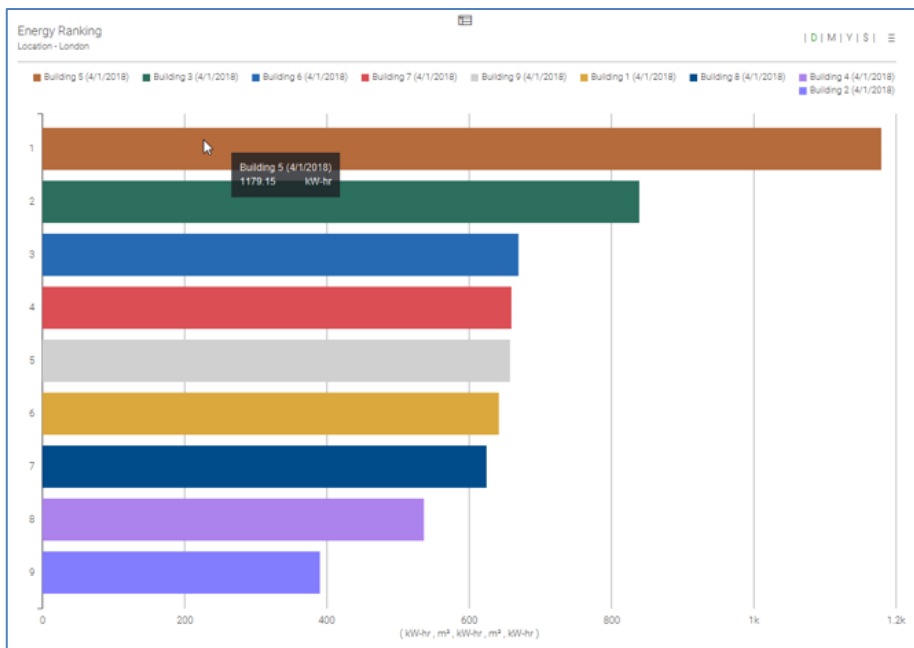
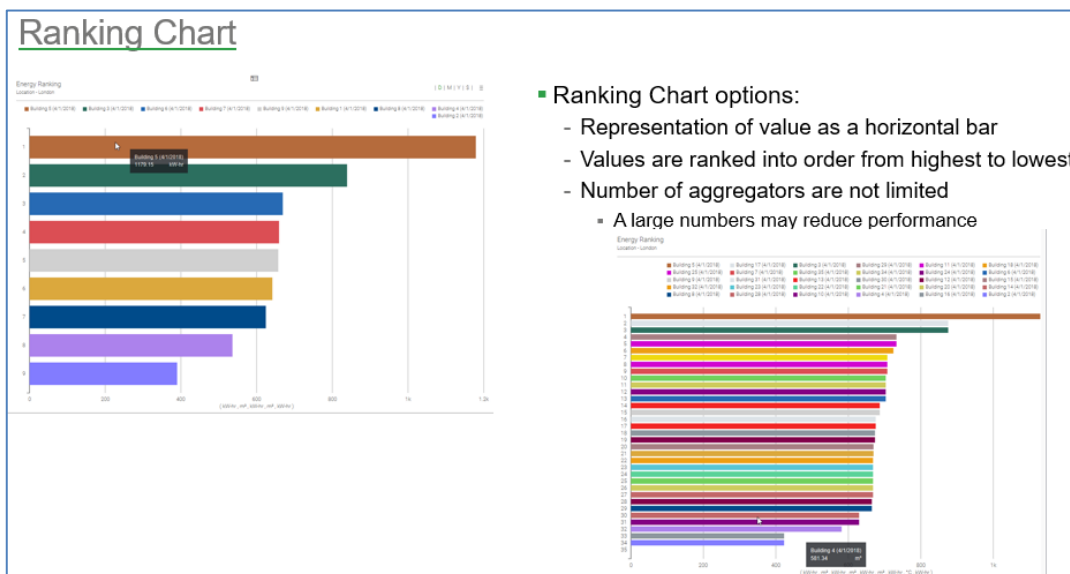


Figure 27 - EXAMPLE RANKING CHART



### Ranking Chart – How To implement

- Add Chart to graphic
  - Open Graphic in “Edit Mode”
  - Open “Energy Vision” Palette
  - Drag & Drop Chart to graphic
  - Adjust the Chart size
  - Configure Chart properties

- 1 = Background Color
- 2 = Chart (Sub) Title
- 3 = timeRange
- 4 = Optional add x- / y Axis Title
- 5 = Add Aggregator to chart
- 6 = Save graphic

## 7.4 Pie Chart

The pie chart displays the total value of all aggregators assigned to it, split into sectors of a circle.

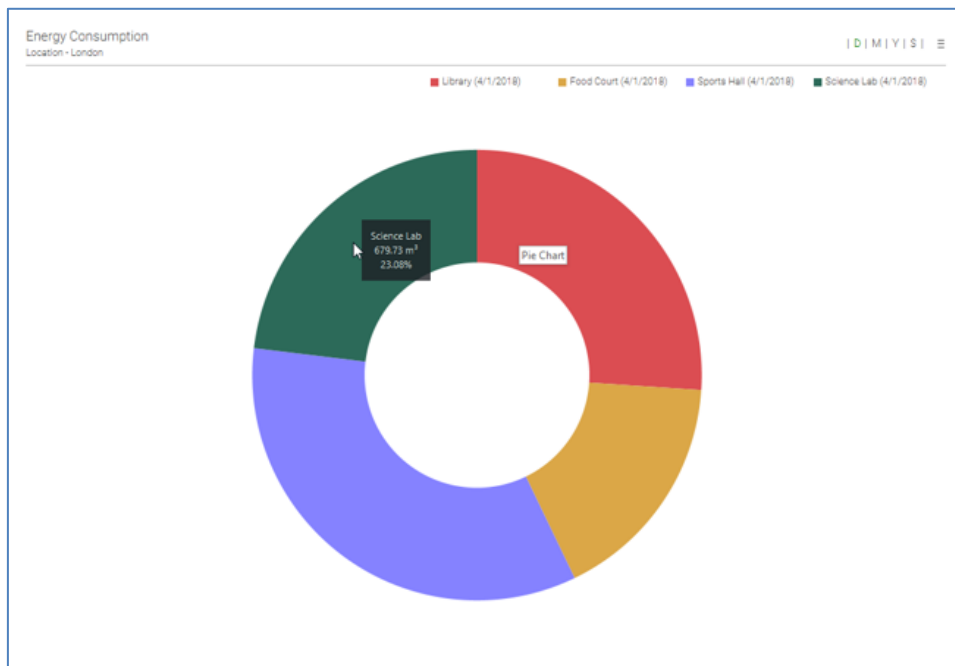


Figure 28 - EXAMPLE PIE CHART



### Pie Chart

- Pie Chart displays:
  - The total value of all aggregators split into sectors of a circle
  - The percentage of consumption
    - The percentage will be recalculated dynamically adding a new aggregator

### Pie Chart – How To implement

- Add Chart to graphic
  - Open Graphic in “Edit Mode”
  - Open “Energy Vision” Palette
  - Drag & Drop Chart to graphic
  - Adjust the Chart size
  - Configure Chart properties
    - 1 - Background Color
    - 2 - Chart (Sub) Title
    - 3 - timeRange
    - 4 - Add Aggregator to chart
    - 5 - Save graphic

Name	Aggregator Ord	Station	Current Period	Color
Library		station: !slot:/Aggregators/Campus/campus_power_usage	15-May-2017	#0b4d52
Food Court		station: !slot:/Aggregators/Campus/campus_water	15-May-2017	#0b4747
Sports Hall		station: !slot:/Aggregators/Library/library_power_usage	15-May-2017	#8582ff
Science Lab		station: !slot:/Aggregators/Library/library_water	15-May-2017	#20a59
Building 1		station: !slot:/Aggregators/Total120Power20Meter	04-Jun-2017	#840084

## 7.5 Stacked Bar Chart

The Stacked Bar Chart offers an alternative view to the Bar Chart. Where the Bar Chart offers the user the view of seeing data represented in bars organised side-by-side, the Stacked Bar Chart will group and stack the data on top of each other. For example, if 2 individual meters represent a room, the engineer could group the 2 meters on top of each other. This would indicate the individual meter values whilst showing the combined total of the 2 meters on a bar chart.

### Properties

The Stacked Bar Chart data configuration is slightly different. Stacked Bar Chart has an extra option: **Category**. All Aggregators with the same Category will be placed on the same stacked bar. Each category will have its own stacked bar.

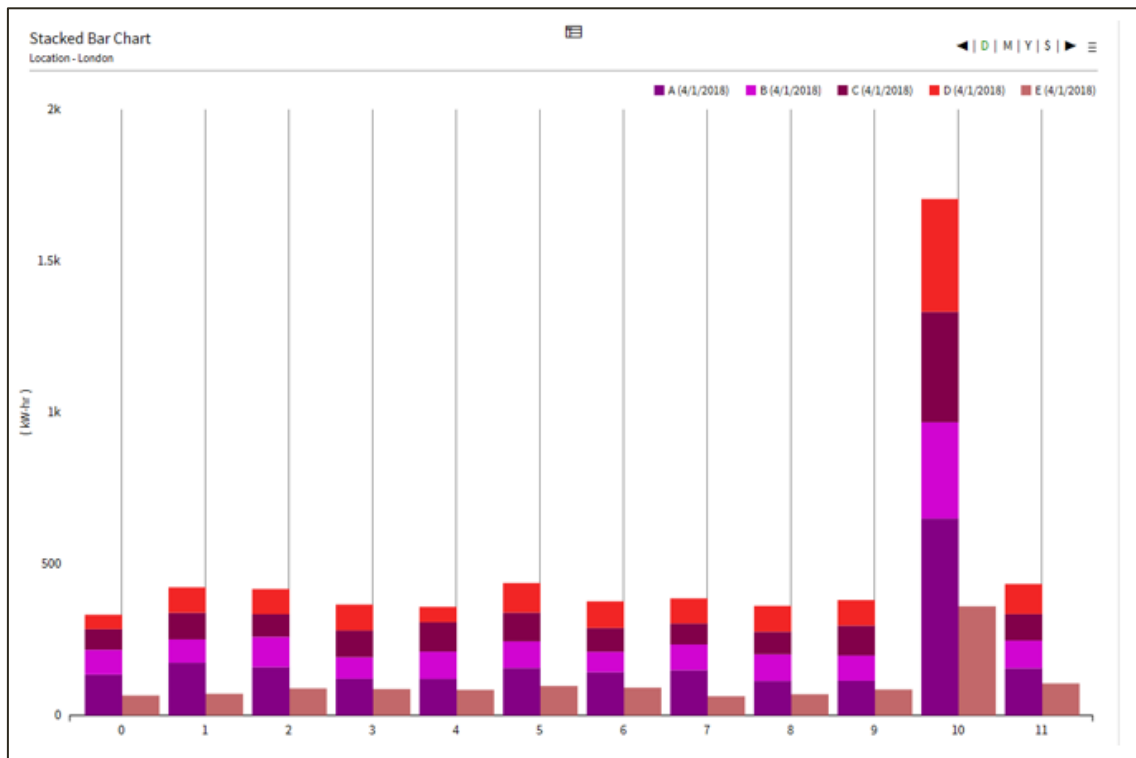


Figure 29 - EXAMPLE STACKED BAR CHART

### Stacked Bar Chart

- Stacked Bar Chart:
  - Is an alternative view to the Bar Chart
  - Aggregators
    - 1 - Can be added to a group
      - The values will be added to one bar within the group
    - 2 - Optional groups can be added

### Stacked Bar Chart – How To implement

- Add Chart to graphic
  - Open Graphic in "Edit Mode"
  - Open "Energy Vision" Palette
  - Drag & Drop Chart to graphic
  - Adjust the Chart size
  - Configure Chart properties (via right lower corner)
    - 1 - Background Color
    - 2 - Chart (Sub) Title
    - 3 - timeRange
    - 4 - Optional add x- / y Axis Title
  - 5 - Add Aggregator to chart
  - 6 - Define the Category
  - 7 - Save graphic

## 7.6 Heatmap

The Heatmap is a widget that allows the yearly data for an aggregator to be represented on a Heatmap chart. The chart will display the value represented by the applicable colour on each day, for each month for the year (if data is available). The Heatmap chart is engineered similarly to the other charts, in that it is directly connected to an aggregator.

### How are the Colours Automatically Applied?

The widget will examine the data being added to it for the entire year. It will then apply a Range based on the minimum & maximum value. The minimum value will be assigned the deepest green and the maximum value will be assigned the deepest red.

Using the example below, the chart is representing the OAT (Outside Air Temperature) for a building. It is clear to see when the temperature rises and lowers. The cooler days/month represented in Green are clearly displayed throughout December & January, with the temperature steadily rising until it peaks between June & August, which are represented with deeper Red.

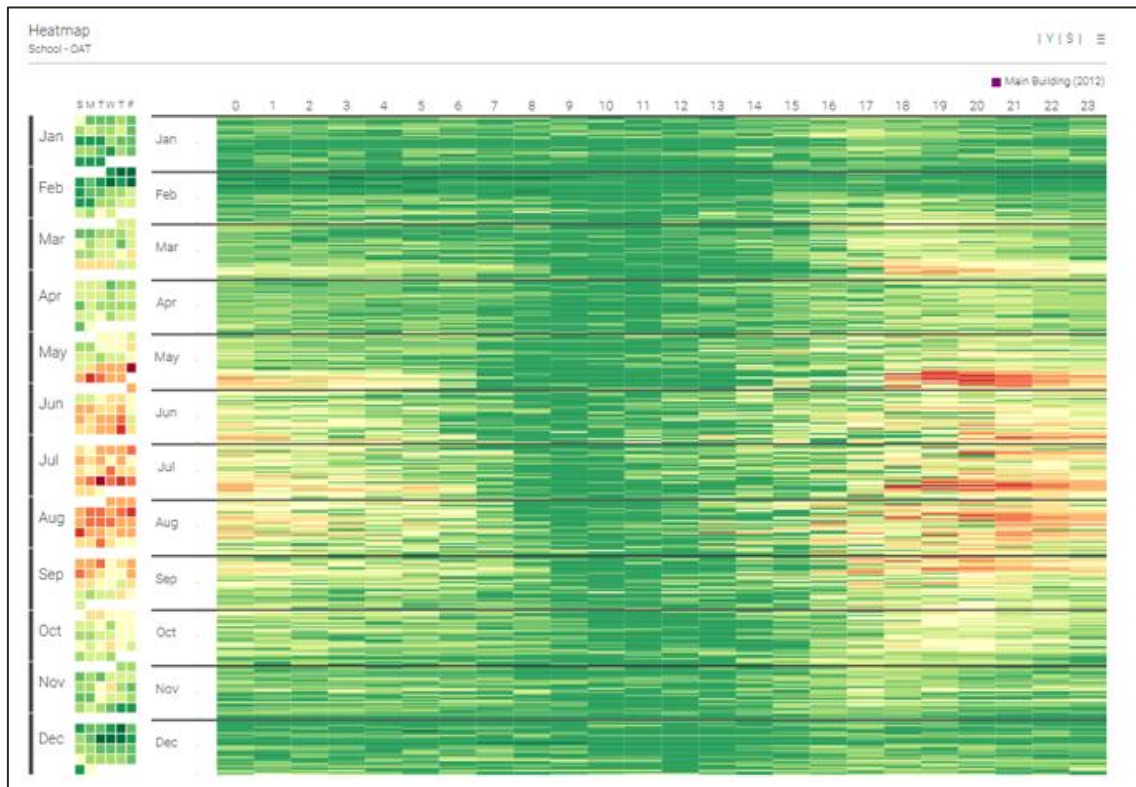


Figure 30 - EXAMPLE HEAT MAP

### Heatmap Chart

- Heatmap Chart:
  - Represents the yearly data of an aggregator in one chart
  - 1 = Hour of the day
  - 2 = Month
    - Click to toggle between hide / show month
  - 3 = Value per day of this hour
  - 4 = Duple click to a value will show
  - 5 = Display consumption or cost

### Heatmap Chart

- How are the Colors Applied?
  - The data for the entire year will be examined
  - A range based on Min- & max value will applied
  - Whole range is split by 10 and a Colour range from green to red will be applied
    - Bright green = minimum value
    - Dark red = maximum value
  - The chart could show if on regular base a value is out of range
- Note:
  - As the chart is rendering a whole year's data set the chart may pause for a moment on first launch, depending on the spec of the PC/Server.

### Heatmap Chart– How To implement

- Add Chart to graphic
  - Open Graphic in "Edit Mode"
  - Open "Energy Vision" Palette
  - Drag & Drop Chart to graphic
  - Adjust the Chart size
  - Configure Chart properties (via right lower corner)
    - 1 = Background Color
    - 2 = Chart (Sub) Title
    - 3 = Add one Aggregator to chart
    - 4 = Save graphic

The heatmap does not contain a property for setting the time period. Instead, the period is set in the data configuration popup. This is because the graph is designed to show yearly data only, so the data configuration popup lets you define that year period.

### 7.7 Degree Day Regression Chart

The Degree Day Regression Analysis chart is a representation of degree days (Heating Degree Days and Cooling Degree Days) and energy consumption.

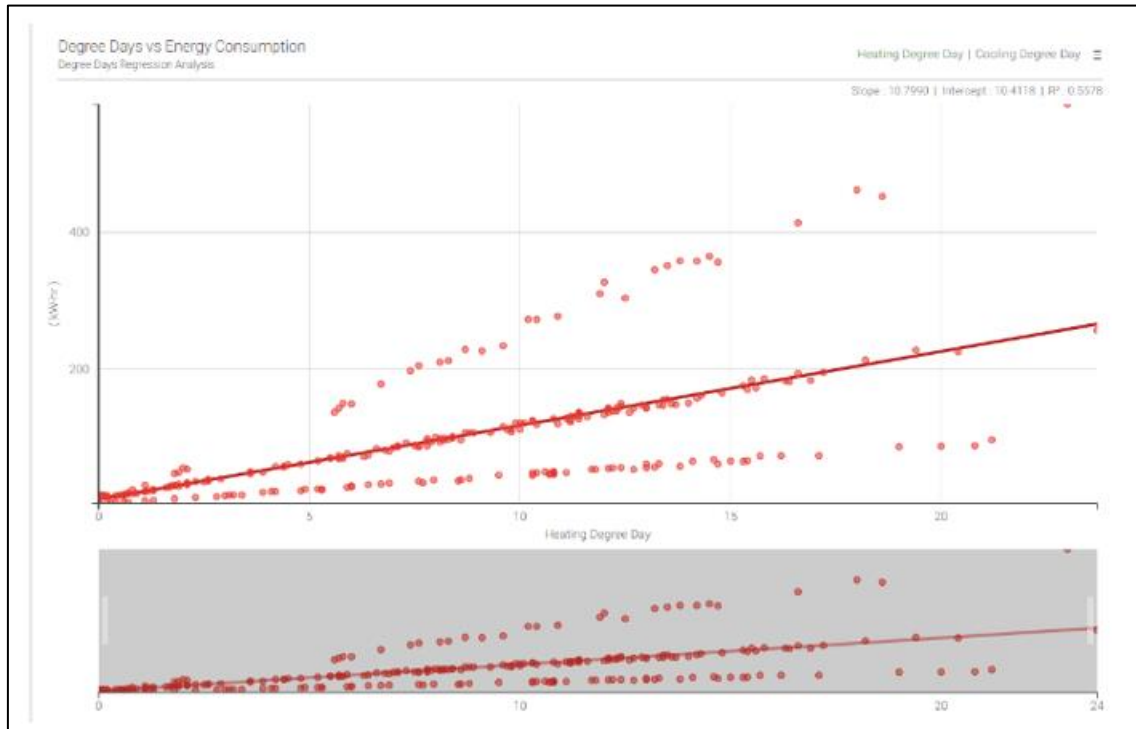
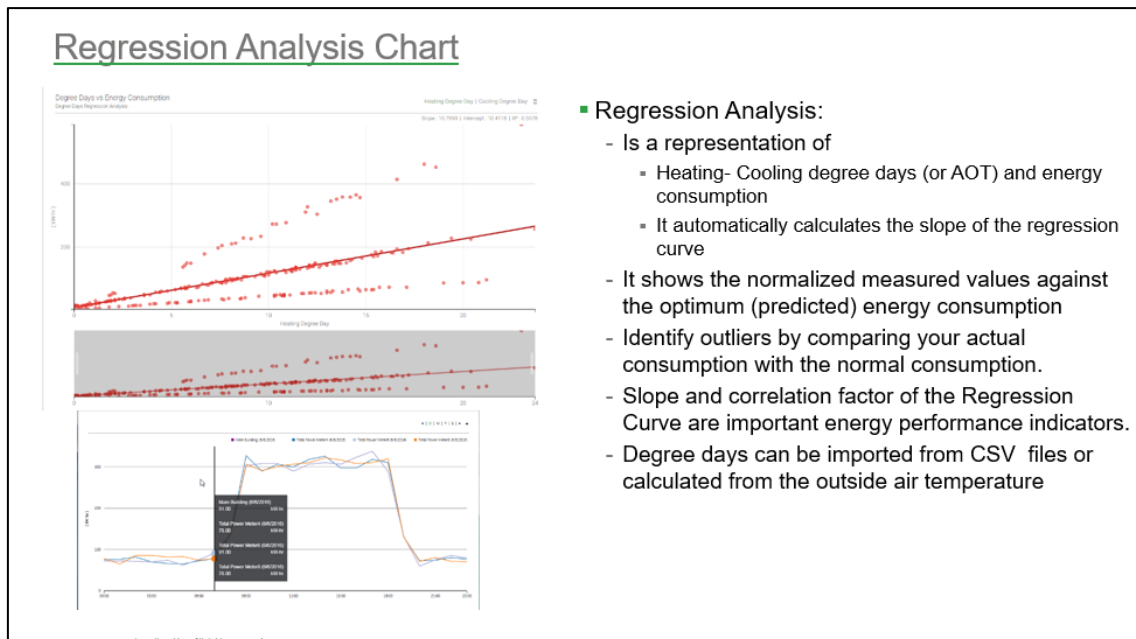
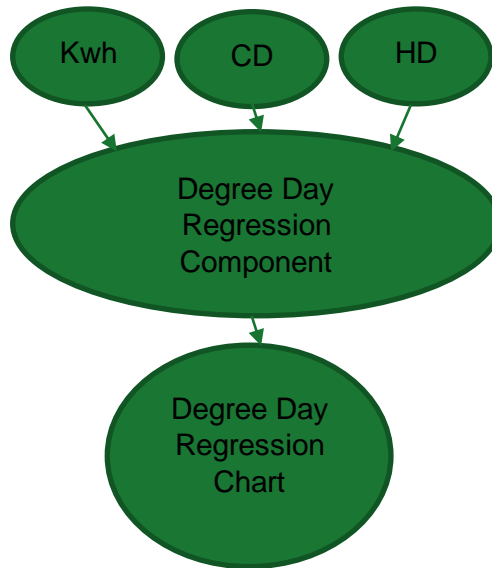


Figure 31 - EXAMPLE DEGREE DAY REGRESSION CHART



- Regression Analysis:
  - Is a representation of
    - Heating- Cooling degree days (or AOT) and energy consumption
    - It automatically calculates the slope of the regression curve
  - It shows the normalized measured values against the optimum (predicted) energy consumption
  - Identify outliers by comparing your actual consumption with the normal consumption.
  - Slope and correlation factor of the Regression Curve are important energy performance indicators.
  - Degree days can be imported from CSV files or calculated from the outside air temperature

The diagram below represents the data flow that allows the Degree Days Regression Component to calculate its data.



The Degree Day Regression chart has three steps to engineer. Firstly, **Degree Days Aggregators** must be present in the station – these differ from standard Aggregators. Secondly, the **Degree Day Regression** component must be added to a station. This is where the Aggregators are configured. Finally, the **Degree Day Regression Chart** needs to be added to a PX Page. When the data property is configured, the component previously configured will be used as the data ORD.

### 7.8 Degree Day Aggregator

The Degree Day component inputs temperature and baseline temperature with the output of Degree Days. Although the Degree Day Component isn't a chart, it can still be linked to a chart allowing the processed data to be presented on a chart. The component would need to be bound to an OAT (Outside Air Temperature).

#### Property Sheet of the Degree Day Aggregator

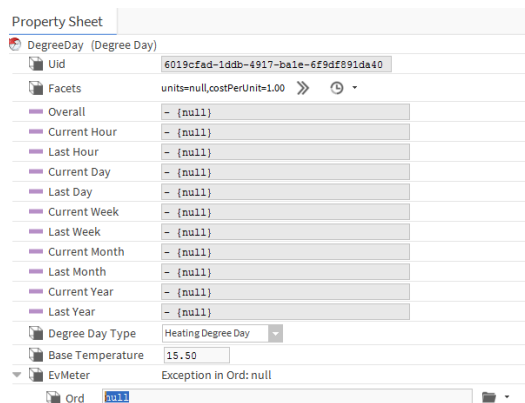


Figure 32 - DEGREE DAY COMPONENT PROPERTY SHEET (NOT CONFIGURED)

- **Facets** – The unit of the data.
- **Degree Day Type** – Switch between Heating and Cooling Degree Days.
- **Base Temperature** – Enter the base temperature of the building.
- **Meter**
- **Ord** – Link to the OAT (Outside Air Temperature) aggregator.

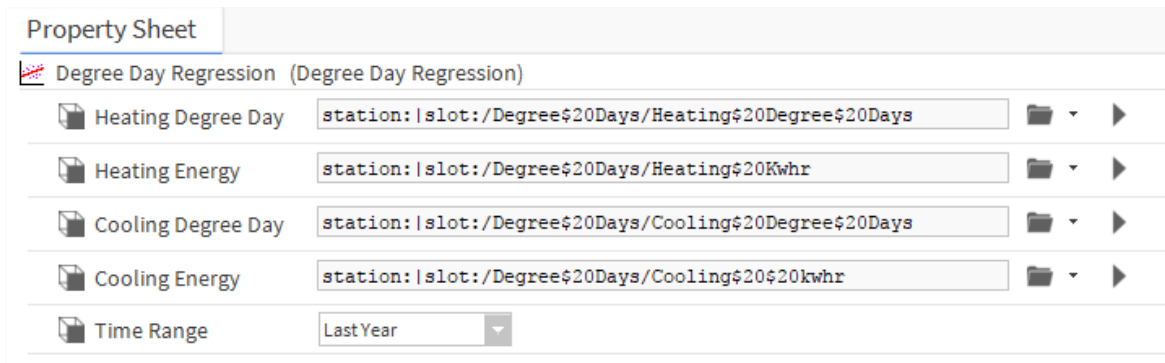
### 7.8.1 How to Engineer the Degree Day Aggregator Component

1. **Drag and drop** the Degree Day Component from the Palette into the wiresheet on which the chart will be displayed.
2. **Double click** on the component.
3. The first setting to change is **Ord**.
  - a. **Click** the drop-down arrow next to the **Folder Icon**.
  - b. **Select** Component Chooser.
  - c. **Navigate** to the OAT (Outside Air Temperature) aggregator.
  - d. **Select** it.
  - e. **Click OK**.
4. Enter the **Base Temperature** for the building.  
Ensure the correct **Degree Day Type** has been selected.

### 7.8.2 How to Engineer Degree Day Regression Component

1. **Drag & drop** the component in the page folder.
2. **Double click** on the component to open the property sheet. (Figure 20)
3. The **Ord** link fields will appear **null**.
  - a. **Heating Degree Day** – Use the drop-down icon next to the folder icon
    - i. select **Component Chooser**
    - ii. Navigate to the **Heating Degree Day** aggregator
    - iii. Click **OK**.
  - b. **Cooling Degree Day** – Use the drop-down icon next to the folder icon
    - i. select **Component Chooser**
    - ii. Navigate to the **Cooling Degree Day** aggregator
    - iii. Click **OK**.
  - c. **Energy** – Use the drop-down icon next to the folder icon
    - i. select **Component Chooser**
    - ii. Navigate to the **Total Energy** aggregator
    - iii. Click **OK**.
4. Using the drop-down menu, select the **Time Range**.
5. Click **Save**.
6. Open the Px Page the **Degree Day Regression Chart** will appear on.
7. Select **Edit Mode**.
8. **Drag & Drop** the **Degree Day Regression Chart** onto the **Px Page**.
9. **Double Click** on the chart.





**Figure 33 - DEGREE DAY PROPERTY SHEET**

1. **Heating Degree Day** – A link to the Aggregator for Heating Degree Day.
2. **Cooling Degree Day** – A link to the Aggregator for Cooling Degree Day.
3. **Energy** – A link to the Aggregator for energy consumption.
4. **Time Range** – Use this setting to define the range of time.

- Regression Analysis Chart inputs:
  - Kwhr
    - Heating- Cooling energy consumption
  - CDD (Cooling Degree Days)
    - Default Base Temperature = 20
  - HDD (Heating Degree Days)
    - Default Base Temperature = 15,5

building standard	base temperature
existing building	15.0 °C
low-energy houses	12.0 °C
passive houses	10.0 °C
  - Degree Day Regression Component
    - Combines the consumption and Degree days
    - Defines the time range of which the regression is performed
    - Data will be feed into the Regression Chart

## 7.9 Energy Temperature Curve (ET Curve)

ET Analysis helps determine how the energy consumption of a site varies with temperature. For a given time period, the kWh/m<sup>2</sup> of a site and temperature can be superimposed onto a graph showing the ideal consumption for the period.

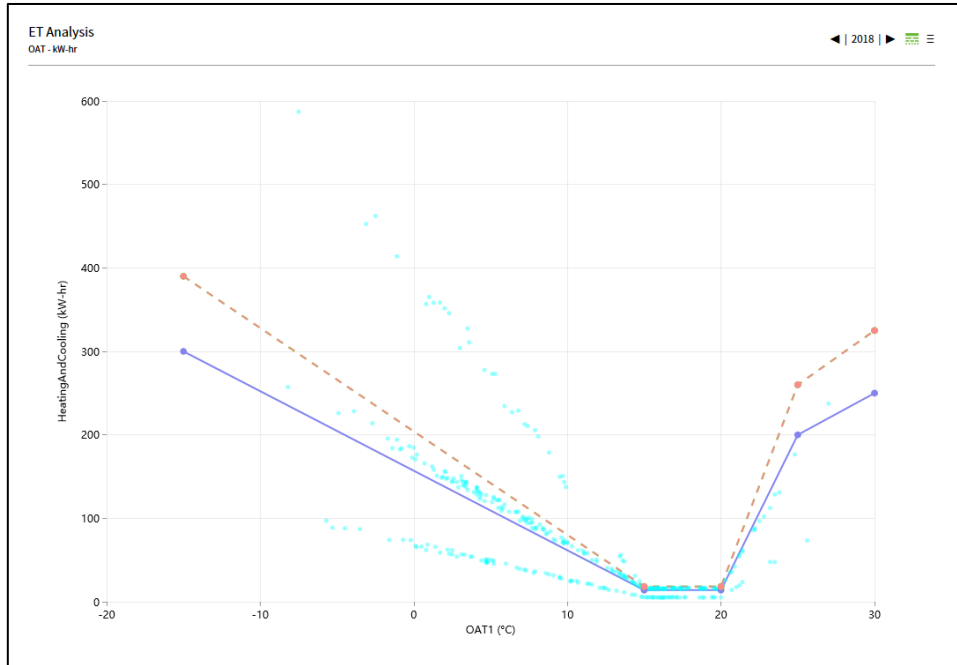


Figure 34 - EXAMPLE ET CURVE CHART

### 7.9.1 Adding an ET Curve chart

Drag and drop an **Energy Temperature Analysis** component from the Palette into the station and configure the properties.

Energy Temperature Analysis (ET Analysis)	
Status	OK {ok}
X Axis Aggregator	station:/slot:/Aggregators/OAT1
Y Axis Aggregator	station:/slot:/Aggregators/HeatingAndCooling
Energy Start	300.00
Energy1	14.00
Energy2	14.00
Energy3	200.00
Energy End	250.00
Temperature Start	-15.00
Temperature1	15.00
Temperature2	20.00
Temperature3	25.00
Temperature End	30.00
Upper Bound	30.00 % [0.00 - 100.00]
Lower Bound	30.00 % [-100.00 - 0.00]

Figure 35 - EXAMPLE ET CURVE COMPONENT PROPERTY SHEET

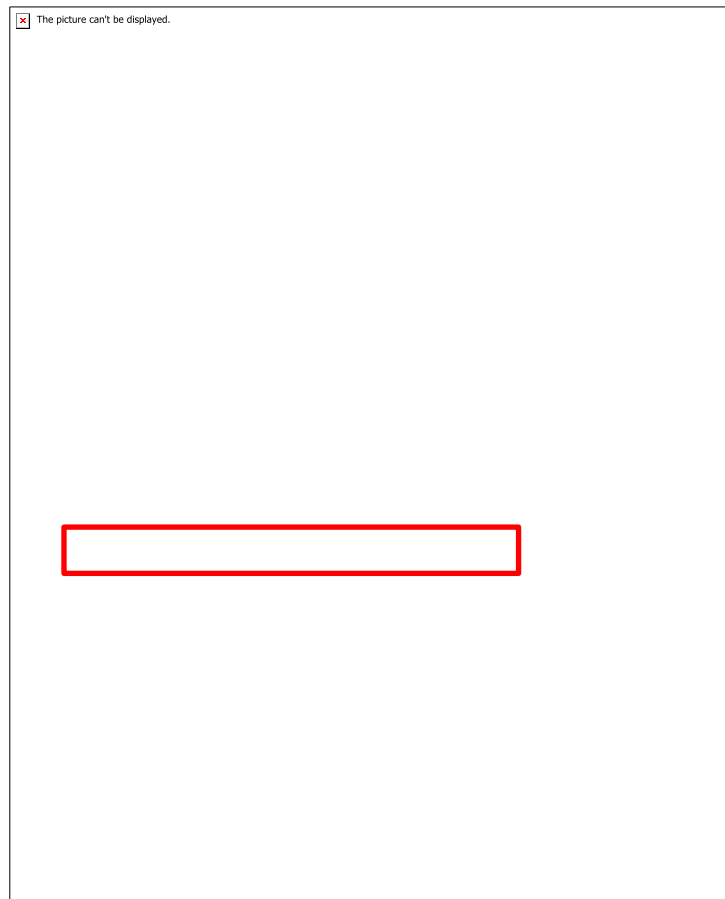


Important, temperatures 1, 2 & 3 must increase in value (Example, Temperature 1 < Temperature 2 etc.).

**Property description:**

- **X Axis Aggregator:** Ord to an Aggregator with temperature data
- **Y Axis Aggregator:** Ord to an Aggregator with energy consumption data
- **Ideal ET profile:** The ideal curve is generated from user-configured temperature, energy and tolerance values.
  - **Temperature:** [Temperature Start, Temperature1, Temperature2, Temperature3, Temperature End] – Temperature range and bands are defined in an increasing order. E.g., [-15,15,20,25,30]
  - **Energy:** [Energy Start, Energy1, Energy2, Energy3, Energy End] – E.g., [300,14,14,200,250]

Drag and Drop the ET analysis chart to the canvas from the palette once the properties have been configured.



**Figure 36 - EXAMPLE OF BINDING TO AN ET COMPONENT**

Once the binding is complete the ET curve chart as shown in figure 40 is created.

## 8 Burger Menu

The burger menu is intended to hide the functionality of the charts until required. It houses the access to instant reports and data quality features. Any configurable option for the chart can be accessed through this menu. Settings made in the burger menu to the configuration of a chart can be saved using the save button in the date config menu. These changes are stored locally and used each time the charts are displayed.

### 8.1 Saving data config locally

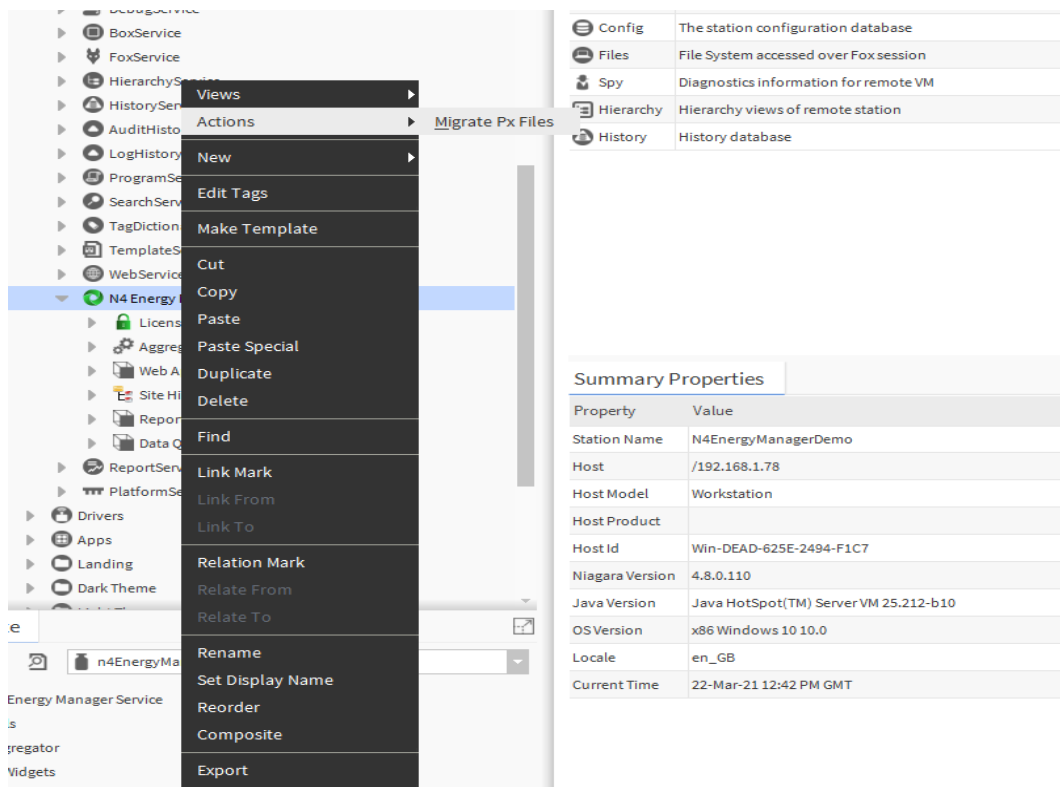
- **For existing charts**

Saving of data config only work if chart contains a property named widgetId, to add a property named widgetid to existing charts, SAIA PCD job must be run.

**Steps for Running SAIA PCD job:**

1. Go to to SAIA PCD workbench and click on **config** directory in the station.
2. Then click on services directory and select Saia PCD Supervisor EM .
3. Right click on Saia PCD Supervisor EM and go to actions
4. In actions, click on 'migrate px files 'job.

Once the job is run successfully, the old charts can persist data config in the browser.

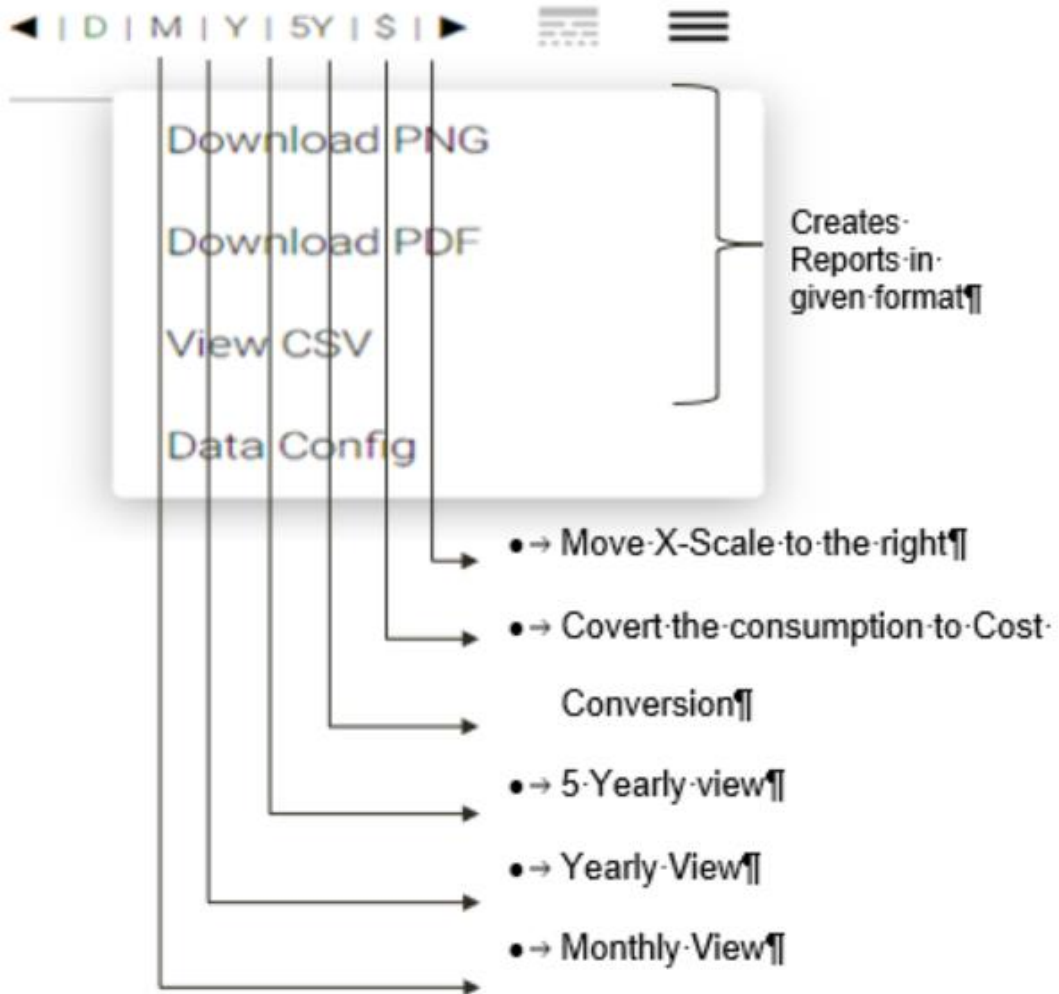


- **For new charts**

There is no need to run SAIA PCD job when adding new charts from the pallette.

## 8.2 Instant Reports

SAIA PCD SUPERVISOR EM charts can produce an instant report as a PNG, PDF or CSV file. The diagram below shows the chart controls and their functionality. Google Chrome must be installed on the machine to support this feature.



### 8.3 Daily/ Weekly / Monthly / Yearly Profiles / 5Y

The D|M|W|Y|5Y profiles that feature in each of the charting components are interactive buttons allowing the user the view data from a different time period.

For example, if the user is viewing the line chart in 'Daily' mode, they would see the most recent data from that day. Using the arrows ◀▶ the user can navigate forwards and back through the data.

When comparing data, the days are aligned. For example, if the user wants to compare yesterday's data (e.g. 2<sup>nd</sup> January 2017) then the chart would compare data from the same day last year (2<sup>nd</sup> January 2016) regardless of whether the actual days (e.g. Monday to Monday) align.

### 8.4 Data Config

The Data Config window can be accessed from the instant report menu.



The chart configuration menu needs to be operated through web browser access. Some of the configuration menu will not work correctly in workbench



Any changes which are made in the Data Config window are not saved and are only visible until the chart is reloaded. (Unless you are using the Data Config menu in the Report Builder – this is explained in the following section.

The Data Config window contains three main tabs:

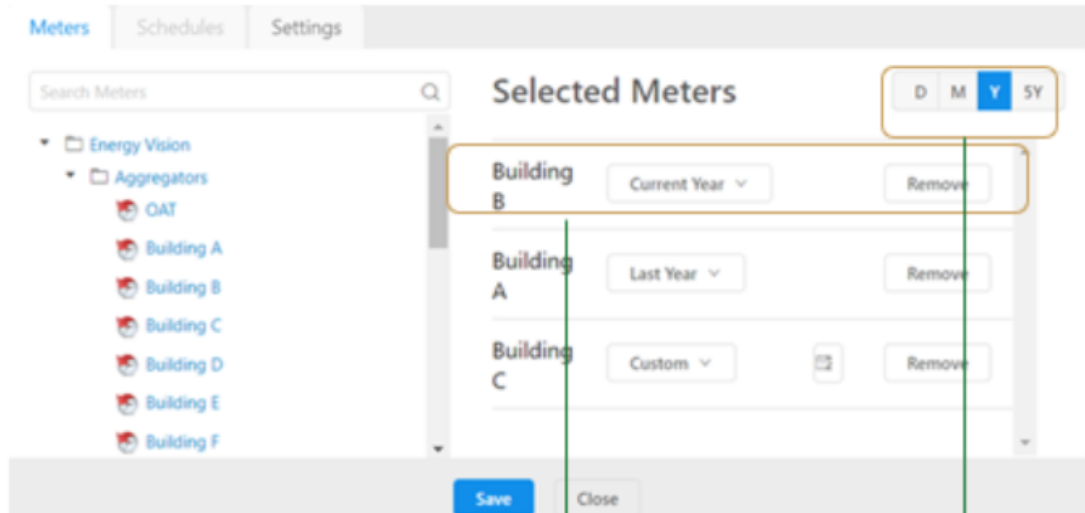
- Meters,
- Schedules
- Settings.

### 8.5 Data Quality

Users can now view the integrity of the data displayed within charts via a 'Data Quality' icon placed to the top right of most charts (not applicable to Regression and the HeatMap charts). The button's colour changes based on the minimum integrity value returned from the data set being displayed on the chart. Further details on this can be found in the main Data Quality section of the document.

## 8.6 Meters

The **Meters** tab allows configuration of which Aggregators (See section on SAIA PCD SUPERVISOR EM Aggregators) are being displayed on the current chart, along with the selection of custom time periods and time ranges depending on the selected time period (e.g. Day, Month, Year, 5 Yearly).



One instance of a meter added to the chart. Depending on the selected time period, the drop down enables time range selection.

This is a list of all Aggregators in the station, selecting one of these will add it to the **Selected Meters** list on the right.

Selects the time period the chart will show.

## 8.7 Change Aggregator Display Name on chart.

Chart data legend display name is the selected data set target Aggregator name by default.

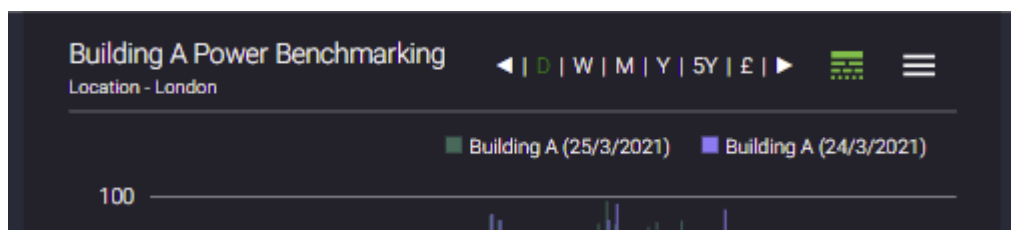
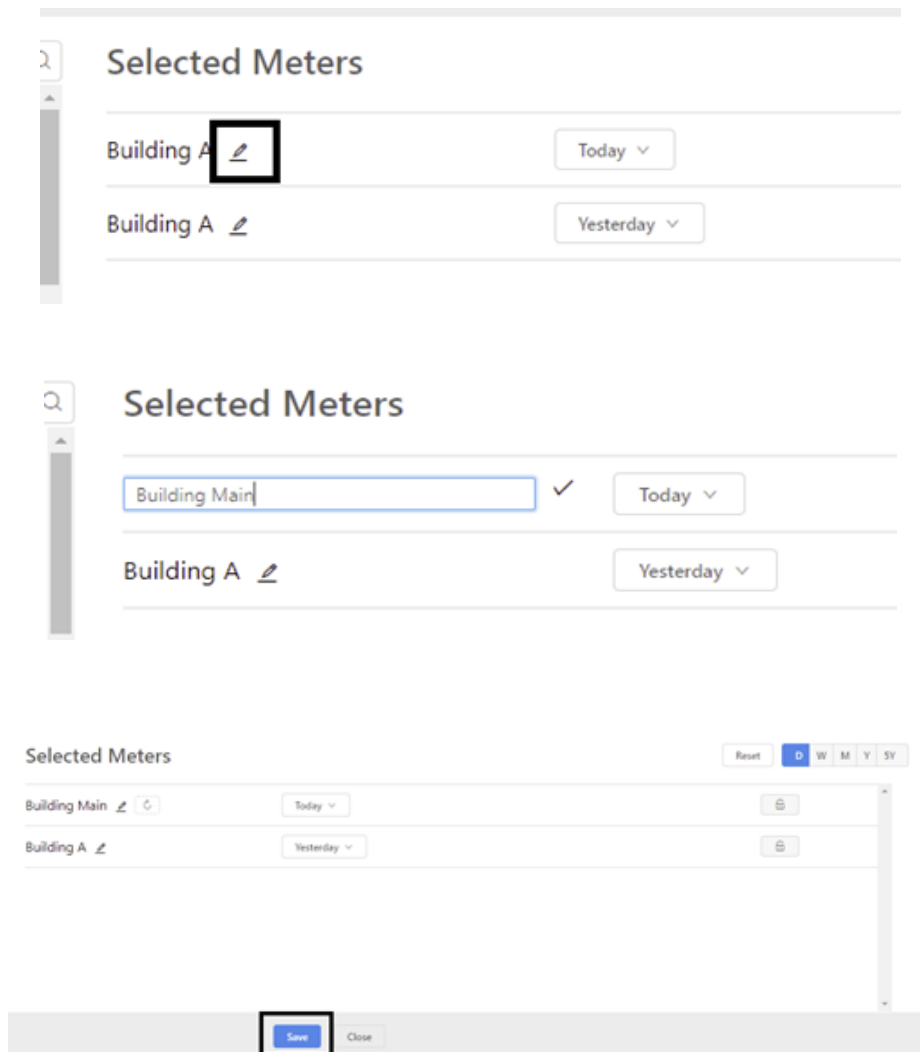


Chart data legend display name on the charts can be changed through the chart Data config menu.

Rename chart data legend name:

- Open data config menu.
- Click on the Icon beside the Aggregator name.
- Change the name in the input box.
- Click in the icon or press Enter button.
- Click Save button on the Data Config menu.



**Note:** Data Config menu Save option must be used to save the new display name to the data legend.

On clicking **reset** Button the data config reset to the defaults (SAIA PCD data config).

The changed chart data legend name will be displayed on the chart legend.



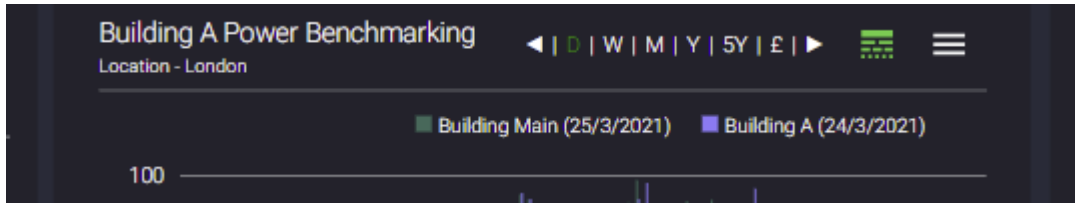
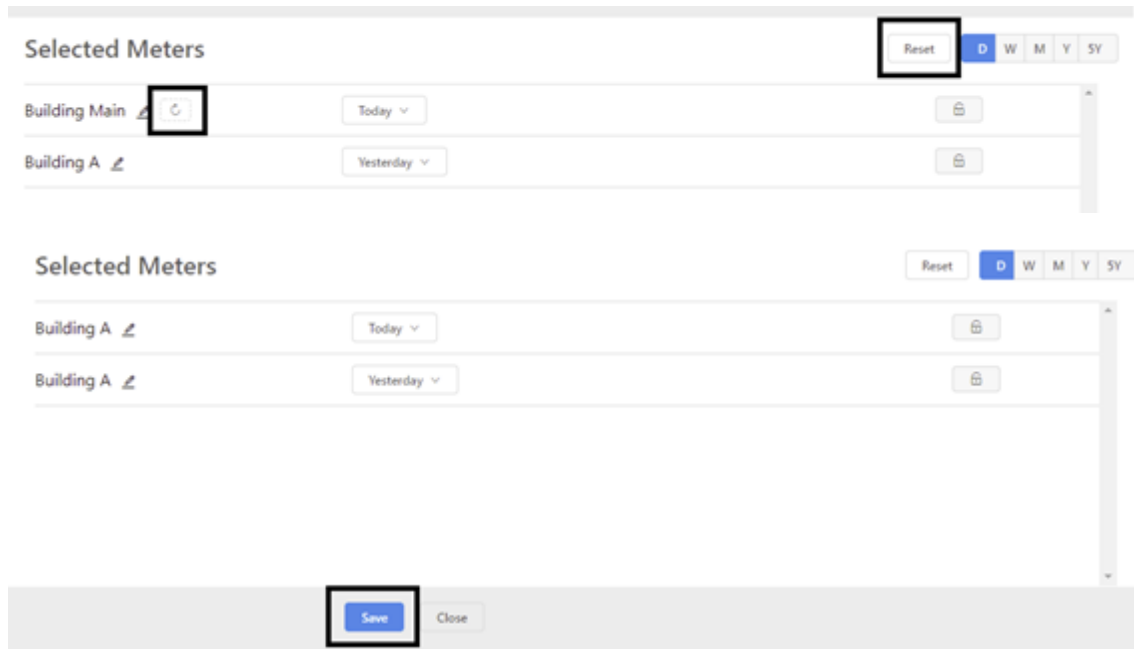


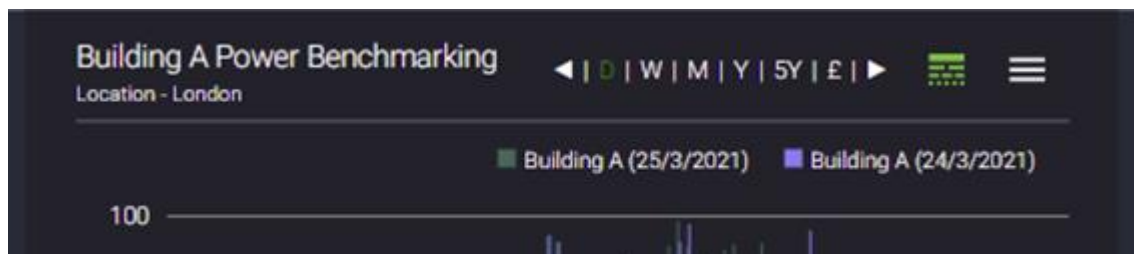
Chart data legend name can be changed many times or Rest to the original name in the Data Config.

Reset data legend name:

- **Open** Data Config menu.
- **Click** on the Reset button beside the Aggregator name or on the right top of the menu.
- **Click Save** button on the data Config menu.



Original Aggregator name will be displayed on the data set legend name after reset.



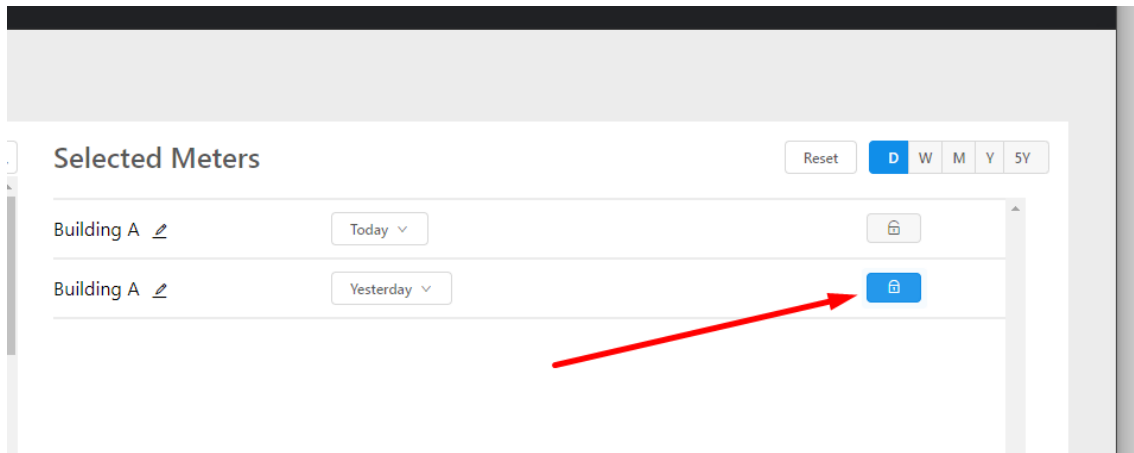
## 8.8 Lock Ideal time range

- Meters can have ideal time locked for a time range from the data config popup for the charts.

- As an engineer meters can be locked from the work bench and can have the default time locked for the ideal time period.

Steps to lock the ideal time range

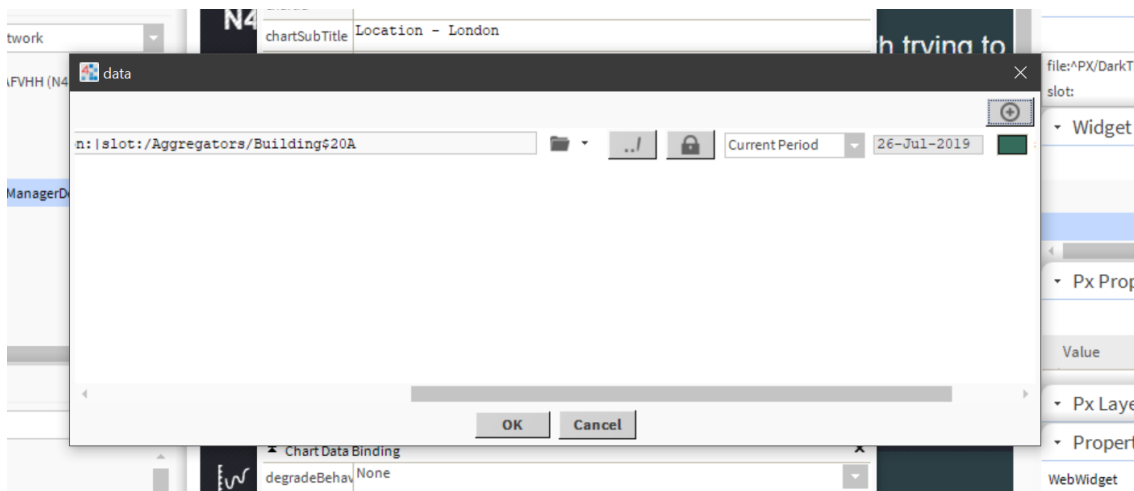
1. Click on the burger menu
2. Lock the selected meter
3. Save



- Locking to default time range can also be achieved by clicking on lock icon on the meter in the data binding.

Steps to lock on the work bench as an engineer

1. Choose a chart
2. Toggle to edit the chart
3. Double to have a menu option
4. Choose Click here to choose ord
5. And lock the required meter



## 8.9 Schedules (special addon for Line Chart)

The **Schedules** tab will only be available within graphical widgets which support the Schedule functionality. The Line Chart supports the Schedule functionality. The **Schedule** function allows the addition of a schedule to the bottom of the chart (e.g. to show occupancy information).

Using the drop-down box, select the Schedule you wish to be displayed on the chart.



In case a new created Schedule will not be visible please restart the station or run “Rebuild Site Tree” under Saia PCD Supervisor EM → Site Hierarchy.

## 8.10 Settings

The **Settings** tab will contain settings relevant to the chart you are editing.

**Show Minimap** – If enabled, the slider on the bottom of the chart will be displayed allowing the user to navigate the chart using either a mouse or their finger on a tablet/smartphone.

**Show Schedules** – If enabled, this will display any added schedules.

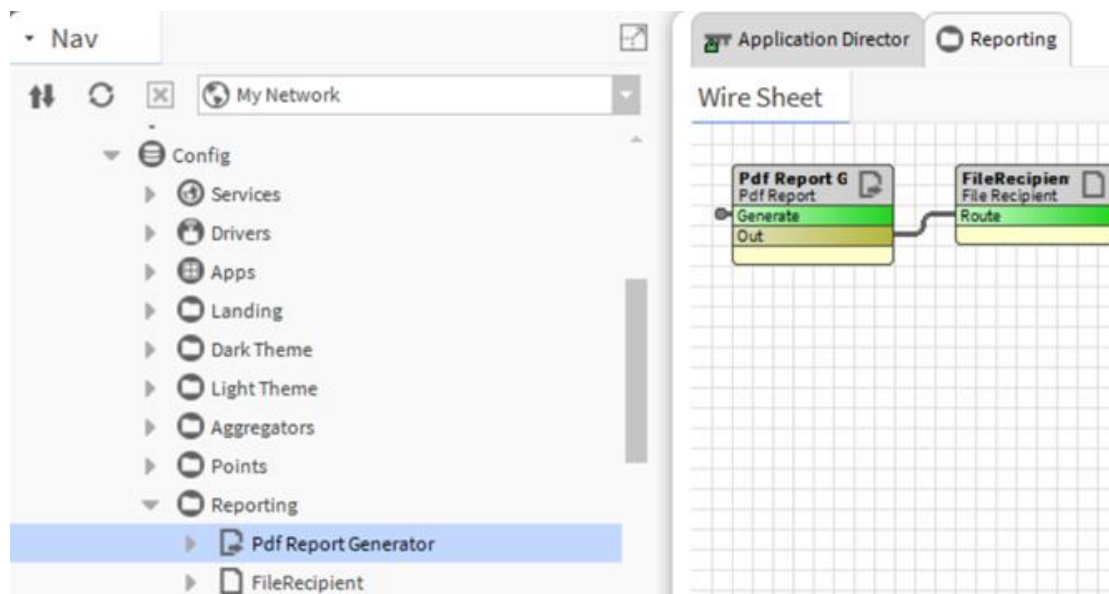
## 9 Batch Reporting

Batch Reports give a powerful way to generate customised reports and automatically generate them on a schedule of your choosing. These reports can then be 'pushed' elsewhere by using standard forwarding options from the Reporting Palette (e.g. Email Recipient or File Recipient).

### 9.1 Enabling the automated reporting service

To enable the functionality of automated reporting in your station a few steps must first be carried out to setup the feature.

1. Create a folder under config (e.g. Report)
2. Add the following component to the report folder
  - a. Pdf Report Generator
  - b. FileRecipient
3. Double click on the report folder to open the Wire Sheet
4. Connect the two component as shown below.



5. Please update headline and number fitting to list above  
Within Workbench, open the Saia PCD Supervisor EM and expand the **Report Manager**.
  - a. Default is disabled. The service needs to be **Enabled**.
  - b. Server Port default is 9000. If no other servers/services are running on that port, leave as default. If not, you can change this to a port of your choice.



Ensure the latest version of Chrome is installed on the Server (where the Saia PCD Supervisor EM station is running). **This is critical to report generation.**

## 9.2 Adding an automated report (Workbench configuration)

Before starting to design the report, the initial setup of the automated must be done in Workbench. You must add a **PDF Report Generator** onto your station and configure the generation period and any forwarding options you want. The following example created an Automated Report and sends the generated report to a File Recipient.

1. Check your license if the Batch reporting feature is enabled
  - a. Get screenshots from Ernie
2. Enable Report option under Saia PCD Supervisor EM
3. Create your recipients in Workbench
4. Create the report template name and recipient in Workbench
5. Design the report via Web Browser
6. Manual execution / Test of the report.
7. Create a new folder under the Station.
  - a. Name it something relevant (e.g. energyReport).
  - b. Open the wiresheet of the folder.
8. Ensure the SAIA PCD SUPERVISOR EM Palette is open in the Palette window.
  - a. Expand **Aggregator**
9. **Drag & Drop** the **PDF Report Generator** onto the wiresheet of the **energyReport** folder.
  - a. Give the component a name (e.g. energyReport)
10. Open the Property Sheet of the **PDF Report Generator**
  - a. Here you can set the trigger mode, frequency and intervals between automatic report generation. **(Figure 9)**
11. In the Palette window, open the **report** Palette.
  - a. Expand Reporting.
  - b. Drag & Drop the FileReceipient component onto the wiresheet.
  - c. Link the out slot of the energyReport to the route slot of the FileReceipient.
  - d. Double-click on the component to open the properties. By default, it will save the report in the root of the station. Create a new folder if required and save the report to the desired location (engineers discretion).
  - e. Enable Append Timestamp.



You could also use the Email Recipient in the same way as the File Recipient to forward to report to an email address.



Other custom logic could be used to trigger the component using the 'Generate Report' action on the PDF Report Generator component.



Reports can be generated manually by right clicking on the component and selecting actions > generate.

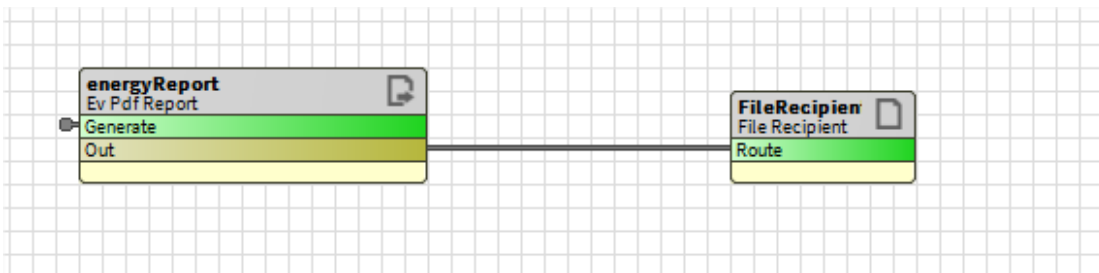


When using the report builder, the user is able to change the names of the selected aggregators using data config popup.



Reports will continuously be generated on the schedule configured. Whether automatic or manual, reports take around 30 seconds to be generated.

**Figure 37 - AUTOMATED REPORTING PROPERTY SHEET**



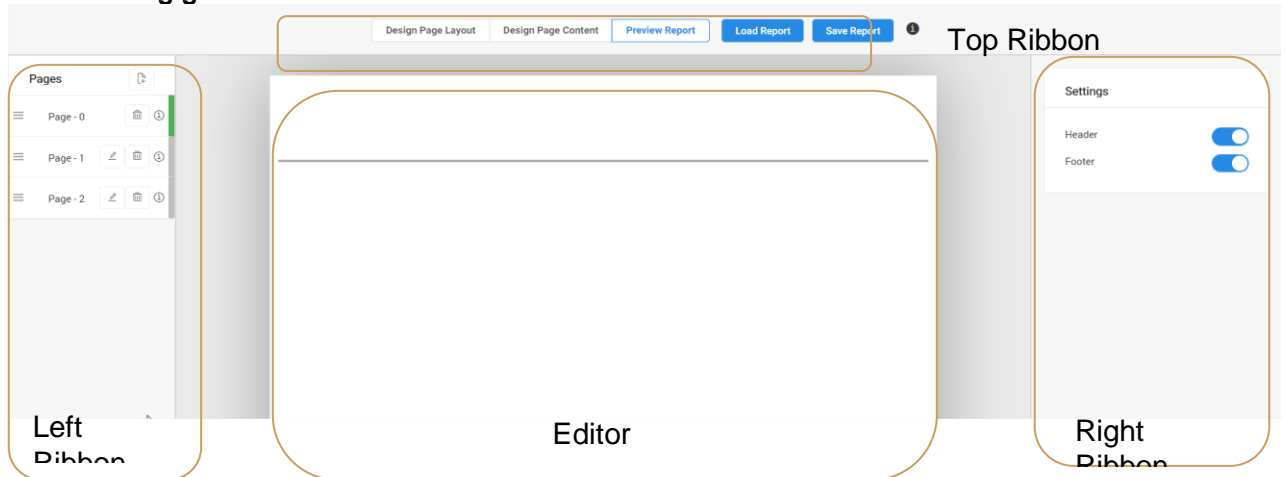
**Figure 38 - WIRE SHEET**

### 9.3 Designing an automated report (Web Browser configuration)

Once the automated report component has been set up in Workbench, the design phase of the report needs to be done via a web browser. The same automated report component, which was added previously, when viewed in a web browser, will present the tools needed to design the report.

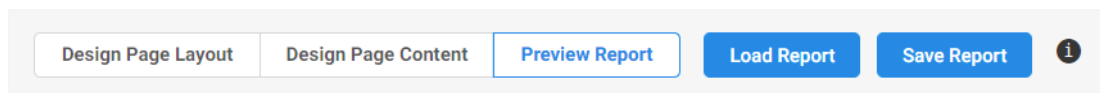
1. Open the web. Login to the station. Use an engineer's login so that the structure of the station can be seen, rather than loading into a graphical PX.
2. Under the folder structure of the station, navigate to the **energyReport** folder.
  - a. Right-click on the **energyReport** component and select **views**.  
**Report Builder** – Responsible for building the reports.  
**Report Viewer** – Responsible for viewing the reports.
  - b. Select **Report Builder**.
  - c. The report designer page will now open.

**Figure 9** shows the layout of the report designer and how each section is referred to in the following guide.



**Figure 39 REPORT DESIGNER**

The report designer has three modes: Design Page Layout, Design Page Content and Preview Report. These can be selected using the top ribbon of the report designer. (Figure 12)



**Figure 40 - MODE SELECTION**

- **Design Page Layout**
  - Allows the header and footer to be resized and edited.
  - When this is selected, the **Add Header Widget & Add Footer Widget** options will appear.
- **Design Page Content**
  - Allows the content of the page to be resized and edited.

- When this is selected the **Add Widget** option will appear.
- **Preview Report**
  - Allows the report to be previewed as it would appear exported.
- **Load Report**
  - This will send the report to the report generator.
- **Save Report**
  - This will save the report.



It is recommended to periodically save your report using the Save Report button to prevent unintended loss of report configuration

## 9.4 Design Page Layout

When in **Design Page Layout** mode, it possible to resize and edit the header and footer of the report. Initially, this is applied to all pages in the report (and any subsequently added pages). This can be overridden per page by using the **Settings** options on the right ribbon (Figure 9).

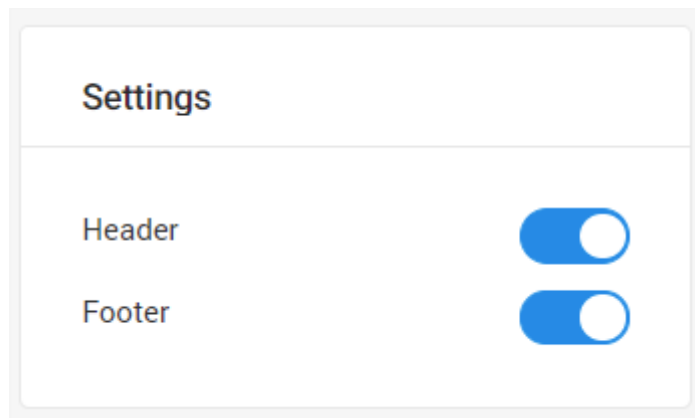
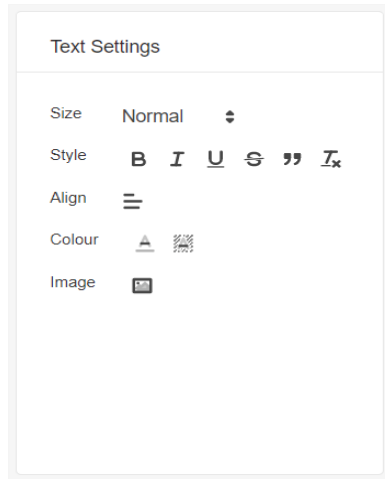


Figure 41 - SETTINGS

In **Design Page Mode** you can use the resize handle on the report page to resize the header and footer.

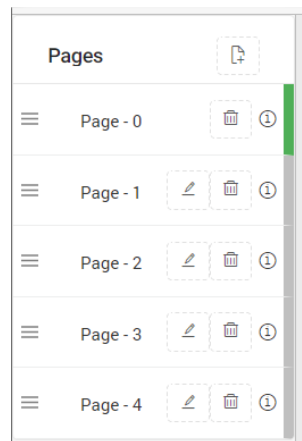
Using the **Add Header Widget** or **Add Footer Widget** buttons in the top ribbon, you can add text widgets to the respective locations. Once these have been added, the **Text Settings** options appear in the right ribbon. Use these to alter text appearance, and to insert images into the text box. (Figure 10).





**Figure 42 - TEXT SETTINGS**

Pages can be configured when in any of the three operating modes by using the Pages options in the right ribbon. This is also the method to navigate to different pages of the report (Figure 11)



**Figure 43 - PAGES**

At the top of the Pages tab, the **Add Pages** button will add a blank page to the end of the report.

Each page will have a **Pencil icon**. Clicking this will enable editing of that page.

Each page will have a **Trash Can Icon**. Clicking this will delete the page.

Each page will have an **I (information) icon**. Hovering over this will display the name of the page.



When adding or navigating to a page, there will be a prompt to save any changes made on the current page.

## 9.5 Design Page Content

When in **Design Page Content** mode, a variety of widgets can be added to the body of your report by clicking the **Add Widget** button and selecting the desired widget (Figure 12).

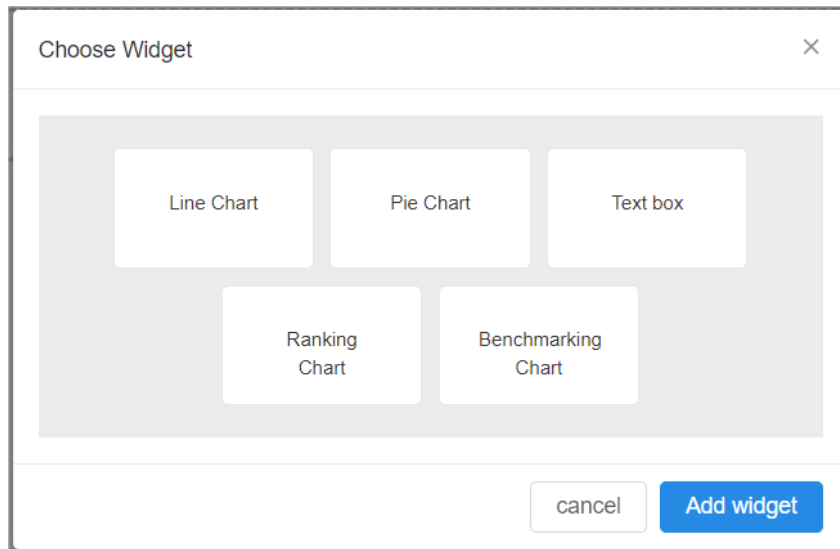


Figure 44 - ADD WIDGET

Once a widget is added to the report, it is configured using the **Data Config** menu, which is explained in the **Instant Reports** section of this manual.



New widgets are always initially added to the bottom of the current page. Using the drag handles you can resize and re-arrange the widgets on the page.

## 9.6 Preview Report

When in **Preview Report** mode, the current page of your report is displayed to check the layout prior to saving.

### Viewing the completed Report

Go back to the folder structure of the station within the browser. Navigate to the folder energyReport, right-click on the energyReport component > views > Report Viewer.

### Printing the report

Following the 'viewing the report' steps. Use Chrome's Print to .pdf / print function by pressing Control P or right-click, print.



We recommend using Google Chrome for printing these reports.

## 9.7 Exiting Report Builder

To exit the report designer, **SAVE** your report and navigate back to the root of your station, by changing the path entering your local IP address 127.0.0.1.



If you type the original station address into the browsers address bar (this may be localhost/domain name or other IP Address), this will take you back to the root of the station.

# 10 Excel Reports & Tenant Billing

Saia PCD Supervisor EM allows you to build your reports, or tenant bills using template Excel spreadsheets built using Microsoft Excel. Saia PCD Supervisor EM will automatically create monthly bills or reports from the templates and generate pdf documents for email or print.

## 10.1 Workflow

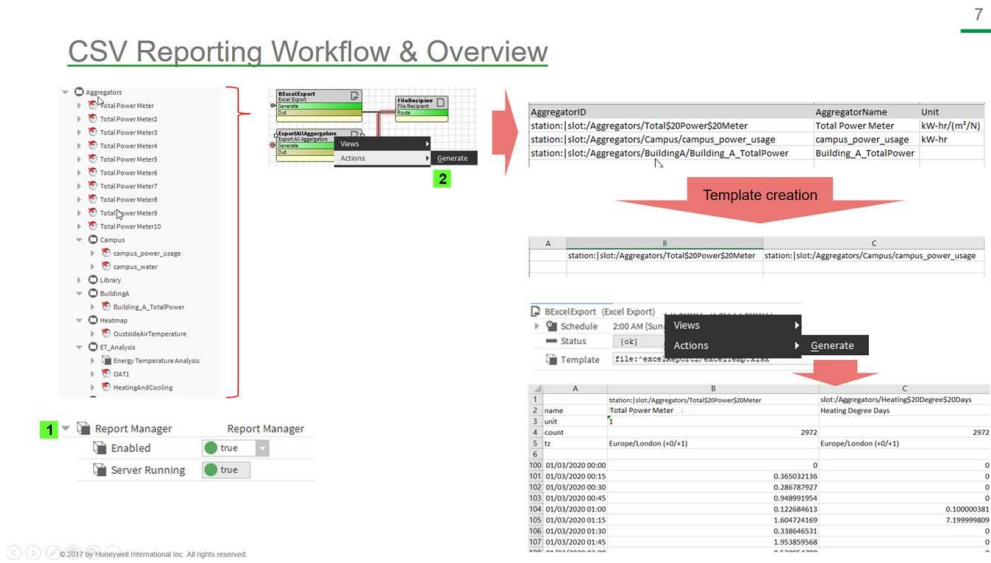
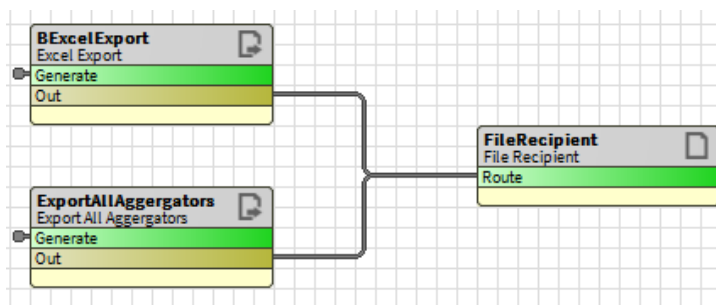


Figure 45 Excel Export workflow

## 10.2 Export all aggregators

1. Navigate to 'config' and create a new folder (called e.g. All\_aggregators) and open the wire sheet.
2. From Palette, enter Energy Manager expand Utils and add components 'ExportAllAggregators' and 'BExcelExport' to the wire sheet.
3. Navigate config>files and create a new folder for file recipient (e.g. ExcelReport)
4. Connect the components 'ExportAllAggregators' and 'BExcelExport' to a 'File Recipient' as shown below.



5. Right click 'ExportAll Aggregators' and select Actions>Generate
6. Navigate config>files>ExcelReport (Excel report containing all aggregators with the station should be available under folder.
7. The report should look like the figure below once open.

Reuse and modify the default template

1	AggregatorID	AggregatorName	Unit
2	slot:/Aggregators/Building\$20B\$20KPI\$20Normalisation	Building B KPI Normalisation	1
3	slot:/Aggregators/Heating\$20Degree\$20Days	Heating Degree Days	
4	slot:/Testing/Relativised/Charts1/Test	Test	in <sup>2</sup>
5	slot:/Aggregators/Building\$20F	Building F	
6	slot:/Testing/Relativised/Charts/Food\$20Court	Food Court	K/s
7	slot:/Aggregators/Building\$20G	Building G	
8	slot:/Aggregators/Building\$20H	Building H	

**Figure 46 Example export of All aggregators in a station**

Report Template (s)

There are two options to use templates for Excel Reporting

- Reuse and modify the default template coming with Saia PCD Supervisor EM installation setup
- Manual template creation

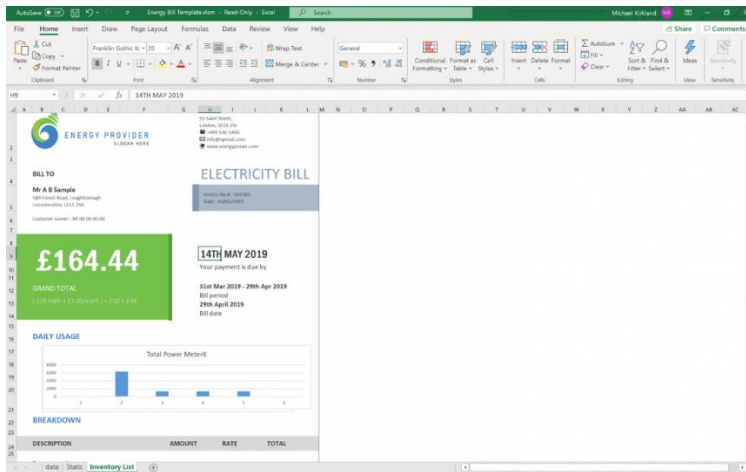
### 10.3 Reuse and modify the default template

Reusing an existing template can be achieved by locating the template in the templates folder of the release and copy it into the station. When a report is run, the template is used by the process to populate the data tab which drives the custom layout of the template itself.

### 10.4 Manual template creation

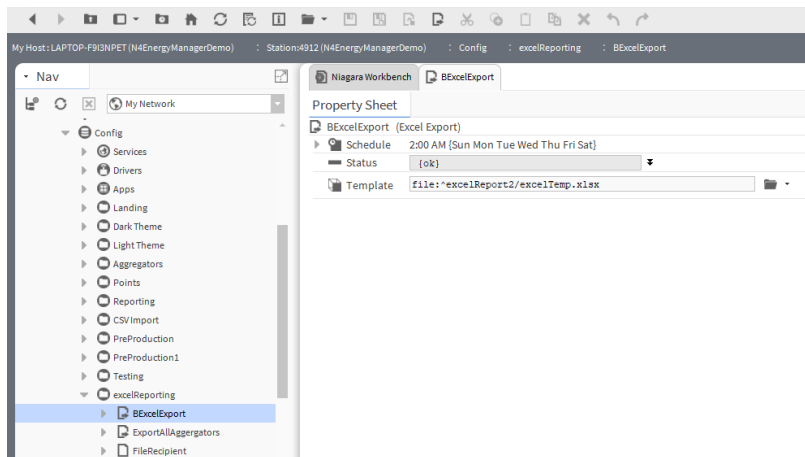
- Create excel template with sheet name 'data' using excel template that came with the release.
- Add aggregator id's to the excel template (first row) starting from cell 'B1' as shown below and save it under share files.

A	B
	slot:/Aggregators/Building\$20B\$20KPI\$20Normalisation
1	slot:/Aggregators/Building\$20B\$20KPI\$20Normalisation
2	name Building B KPI Normalisation
3	unit 1
4	count 2972
5	tz Europe/London (+0/+1)
6	
100	01/03/2020 00:00 0
101	01/03/2020 00:15 0.365032136
102	01/03/2020 00:30 0.286787927
103	01/03/2020 00:45 0.948991954
104	01/03/2020 01:00 0.122684613
105	01/03/2020 01:15 1.604724169
106	01/03/2020 01:30 0.338646531
107	01/03/2020 01:45 1.953859568
108	01/03/2020 02:00 0.520954788
109	01/03/2020 02:15 1.155905008
110	01/03/2020 02:30 0.099702001
111	01/03/2020 02:45 0.435257524
112	01/03/2020 03:00 0.11433012
113	01/03/2020 03:15 0.837152839
114	01/03/2020 03:30 1.171193361
115	01/03/2020 03:45 2.099998713
116	01/03/2020 04:00 0.938001096
117	01/03/2020 04:15 0.869348705
118	01/03/2020 04:30 1.220317602
119	01/03/2020 04:45 1.739819884
120	01/03/2020 05:00 0.723166585



## 10.5 Generate report using template

1. Navigate config>select the folder containing ExcelReport.
2. Double click on component 'BExcelExport'
3. Import the excel template
4. Right click on the component and select Actions>Generate



Excel reports can also be configured to append the date to the filename ensuring subsequent report runs do not overwrite previous versions. This can be achieved through the properties of the report component.



Report contain the following information,

1. Header (name, unit, count and time zone)
2. Time zone of the system which generated the report
3. Records start from row 100, as row 0-99 is reserved for header values.
4. The data for a monthly time range

## 11 Engineering Saia PCD Supervisor EM

Sites can be engineered from scratch or by customizing the demo station.

### 11.1 Demo Station

If you are using the provided demo station as a starting point for your own station or to present Saia PCD Supervisor EM, the login details are:

**Username:** “admin”

**Username:** “demo”

**Username:** “HBdemo”

**Password:** “Clax123456”

**Station Passphrase:** “Clax123456”



Default Username and Password should be changed in your own station for security.



A prerequisite is that histories have already been brought into Saia PCD.

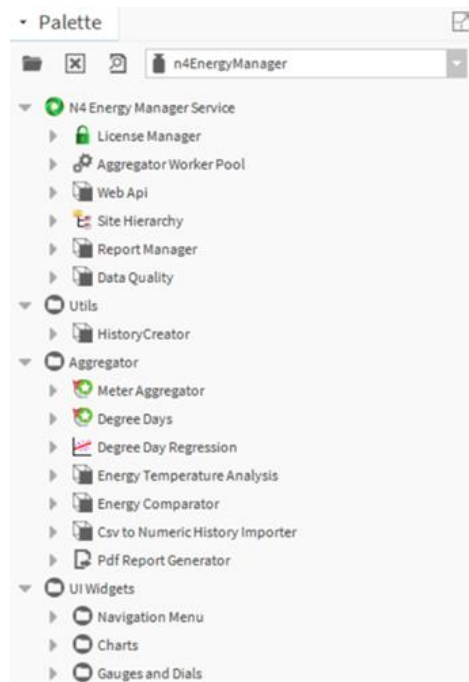
### 11.2 Saia PCD Supervisor EM Palette

The SAIA PCD SUPERVISOR EM palette is where all the SAIA PCD SUPERVISOR EM components can be accessed from. This includes the Services that provide the SAIA PCD SUPERVISOR EM processing functionality, but also the

To expose the Palette, follow these steps:

1. Click **Window** the top bar.
2. Select Side Bars.
3. Select **Palette**.  
Now the Palette sidebar is opened, the SAIA PCD SUPERVISOR EM Palette can be accessed.
4. In the Palette window, click the **folder** icon.
5. The Open Palette window will now open.
6. In the filter search box, search SAIA PCD SUPERVISOR EM.
7. Select SAIA PCD SUPERVISOR EM, click Ok.
8. The SAIA PCD SUPERVISOR EM Palette will now be open in the Palette window.





**Figure 47 - EXAMPLE PALETTE**


- **UI Widgets** – Houses all of the widgets which can be added to a PX Page
  - **Navigation Menu** – The components for the navigation menu.
  - **Charts** – The folder in which all the charts are stored.
  - **Gauges and Dials** – The folder in which all the gauges and dials are stored.
  
- **Saia PCD Supervisor EM** – Houses the services on which Saia PCD Supervisor EM runs.
  - **Licence Manager** – The service that is responsible for managing the licences for SAIA PCD SUPERVISOR EM.
  - **Aggregator Worker Pool** – The service that allows the user the modify the amount of the threads the aggregator can use simultaneously.
  - **Web API** – Allows the user the check, disable & enable the Web API service
  - **Site Hierarchy** – This component allows the histories to be brought into the station as aggregators.
  - **Report Manager** – This component allows the report manager to be enabled/disabled and the port on which it operated to be changed.
  
- **Aggregator** – Houses the services which allow the user to add the Meter Aggregator & Energy Comparator
  - **Meter Aggregator** – Allows the user to access the aggregator component
  - **Degree Days** – The aggregator designed specifically for calculating Degree Day data.

- **Degree Day Regression** – The component that combines 3 aggregators, Kwhr, Heating Degree Days & Cooling Degrees Days.
- **Energy Comparator** – The service in which users can input their energy consumption and cost per unit, and the component will output how much the energy consumed has cost.
- **CSV to Numeric History Importer** – A tool to import CSV files into a numeric history.
- **Pdf Report Generator** – Used to create an instance of an Automated Report.

### 11.3 User Interface Widgets

Contained in the **UI Widgets** folder of the SAIA PCD SUPERVISOR EM Palette file are the graphical widgets which can be used to display data within your station. You can combine these with standard SAIA PCD widgets to create a wide range of displays. Each widget has its own set of properties which can be set in workbench. Some of these are duplicated in some or all the widgets and some are unique to individual widgets.

Selected charts (Ranking / Pie / Benchmarking / Line) can be converted to a tabular CSV view whilst being viewed.

1. Ensure the chart has been configured with the appropriate aggregator.
2. Hover over the chart.
3. A table icon will appear. 
- a. The table icon is a toggle button. Click once to initiate, click again to deactivate.
4. Click on the table icon to convert the graph to a table view.
5. The chart will now convert to a table.
6. Click on the button again to toggle back to the graphical chart.

### 11.4 Widget Properties

This section will look at the various widgets available in SAIA PCD SUPERVISOR EM, their purpose and information on how to engineer them.



Where Widget Properties are duplicated, they will be described in the first Widget they appear in. Please refer to other previous Widget Property descriptions if one appears to be missing.

When a widget is added from the SAIA PCD SUPERVISOR EM palette to the PX Page in Workbench, the widget properties can be accessed by using the **Properties Tab**.



It is possible to access widget properties by double clicking on the widget. However, we recommend using the Properties Tab to add meters as some properties do not display as expected when using the double click method.

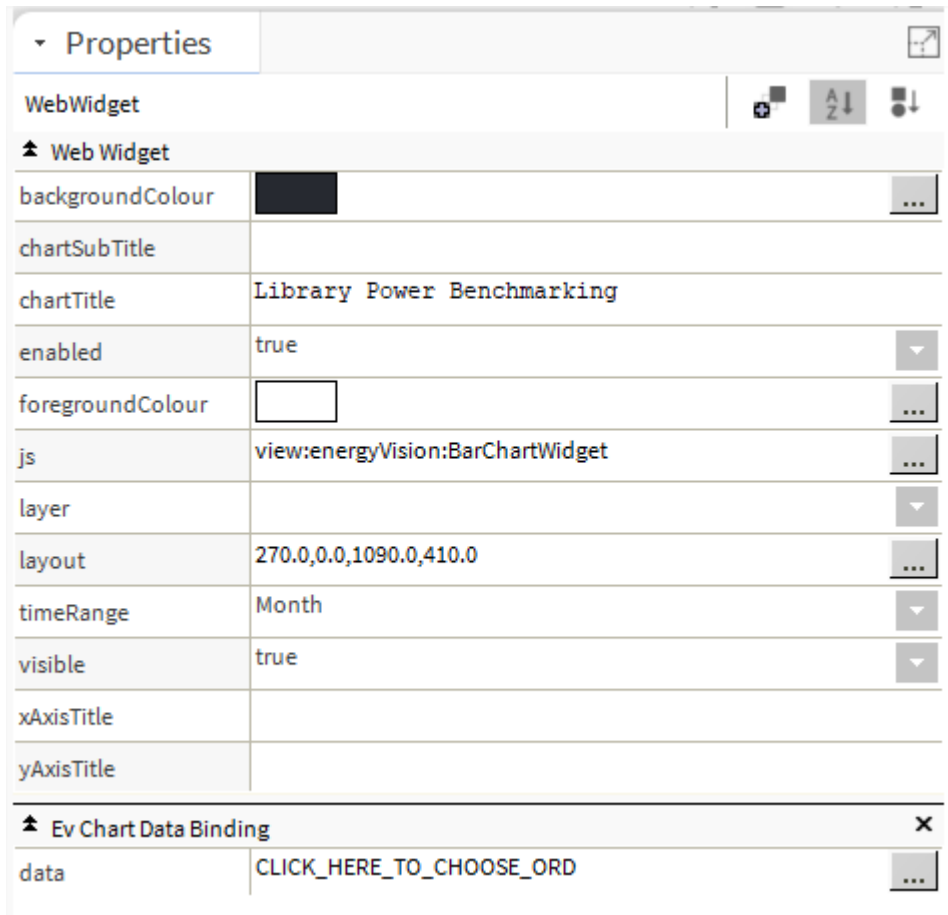


Figure 48 - EXAMPLE WIDGET

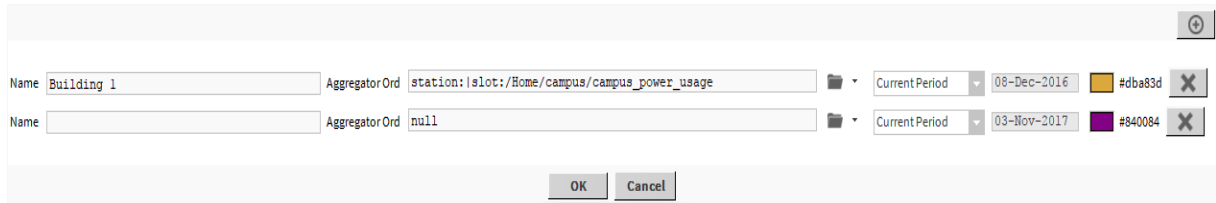
### Properties

The Widget Properties section is divided into two columns: the property name and its value. Depending on the type of property, the value column will allow different types of input – this could be, for example, a colour from a colour picker, an ORD, or a Boolean value

### Data Config

Most SAIA PCD SUPERVISOR EM charts will use the **Chart Data Binding** property to set the data to be displayed. When you click on the value column, you will be presented with the data configuration popup.

Using this popup, you can add Aggregators to the chart. You can further configure the name which will appear in the chart, the time period and an associated colour.



**Figure 49 - EXAMPLE CHART CONFIGURATION**

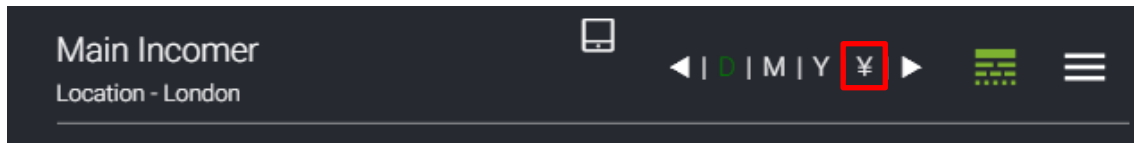
1. Click the **drop-down arrow** on the right of the folder icon, **select Component Chooser**.
2. Navigate to the desired **Meter** that needs binding. **Select & Click Ok**.
  - a. To add an additional aggregator to the Line Chart, click the **'+' sign** in the top right-hand corner of the **data pop-up**. **Repeat steps 5 & 6**.
  - b. Use the **X button** and the end of each entry to remove that aggregator from the current configuration.



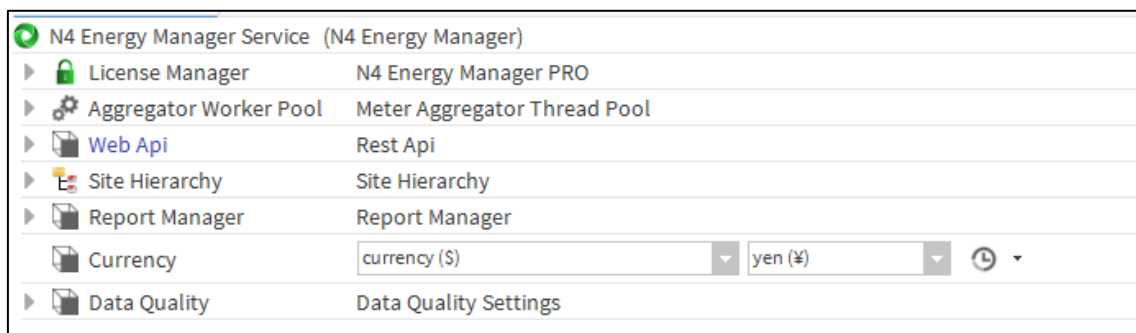
Aggregators must be individually named.

## 11.5 Currency symbol

The currency symbol on the chart headers can be configured using the currency option under services in the station.



**Figure 50 - EXAMPLE OF YEN CURRENCY ON A CHART**



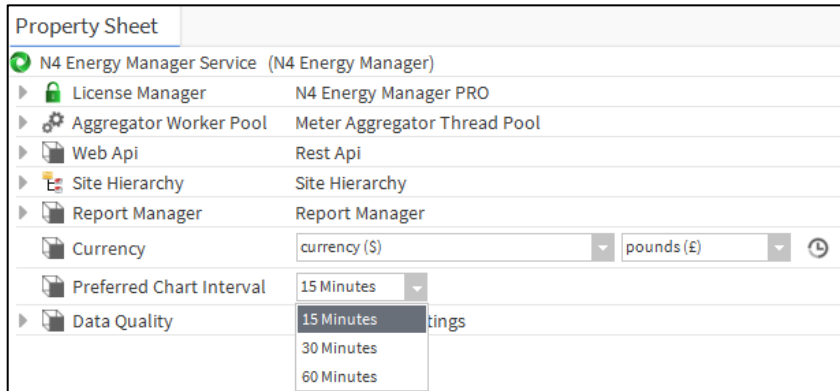
**Figure 51 - EXAMPLE CURRENCY SELECTOR IN Saia PCD Supervisor EM**

## 11.6 Preferred Chart Interval

This feature provides the ability to configure the time interval for the charts globally. The chosen interval is used by the charts when displaying hourly information. Eg: *A choice of 30 Minutes would force the charts to display two data points for every hour*

Precondition:

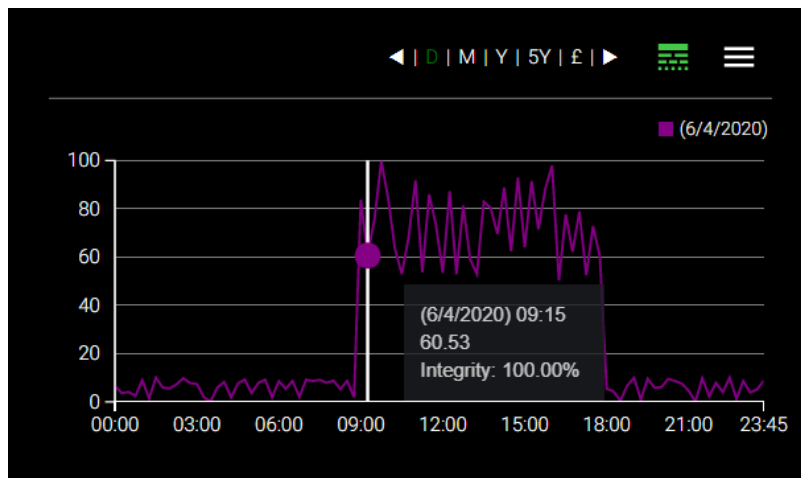
- Config>Services>energy Manager Service
- Set 'Preferred Chart Interval' to e.g. 15 minutes



**Figure 52 - PREFERRED CHART INTERVAL OPTIONS IN THE PROPERTY SHEET**

Steps to create charts with e.g. 15 minutes time interval

1. Navigate to defined PxPage under Station>config>Select the PxFolder
2. Toggle to PxEditor mode
3. Add new Line or Bar Chart
4. Double click on the chart.
5. Select Ord to connect aggregator to the chart for current period, last period and custom.
6. Set time range to Day and click 'OK'
7. The chart should be displayed with 15 minutes interval.



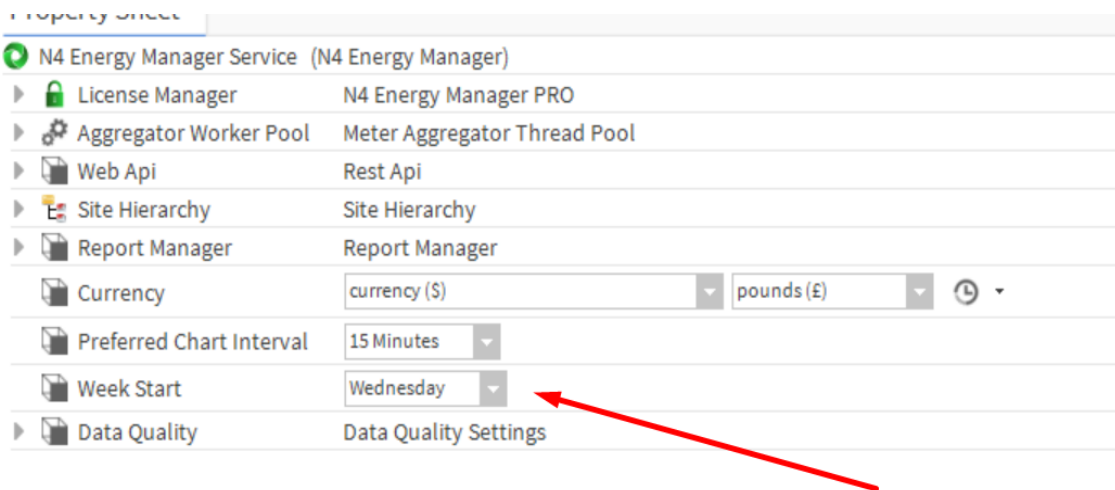
**Figure 53 - EXAMPLE LINE CHART WITH 15MIN TIME INTERVAL**

## 11.7 Weekly Time Range

User can choose a weekly time range on all applicable charts. Weekly chart with the start of week can be configured from the Energy Manager service *Week Start* property.

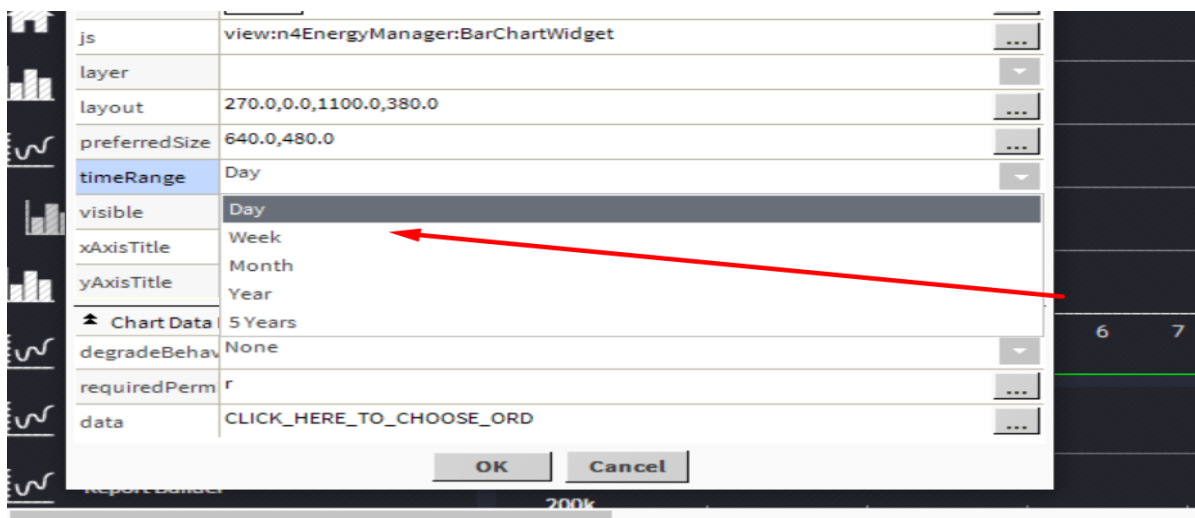
Steps to choose start of week.

1. From the station navigate to Energy Manager service
2. Choose the week from the drop named *week start*.
3. Save the changes
4. Choosing weekly chart would draw the chart for the week start chosen above.



Steps to choose week as default interval

1. Toggle Px page to edit mode.
2. Add Line, Bar, Ranking or Pie chart
3. Double click on the chart.
4. Set the time range to week
5. Save



### 11.8 5 Year Time Range

Users can choose a five year time range on all applicable charts. The 5Y along with lastPeriod can be used to display past data up to a 10-year period.

1. Steps to create charts with 5 years interval
2. Toggle Px page to Edit mode.
3. Add Line, Bar, Ranking or Pie Chart.
4. Double click on the chart.
5. Set the 'timeRange' to 5 years.

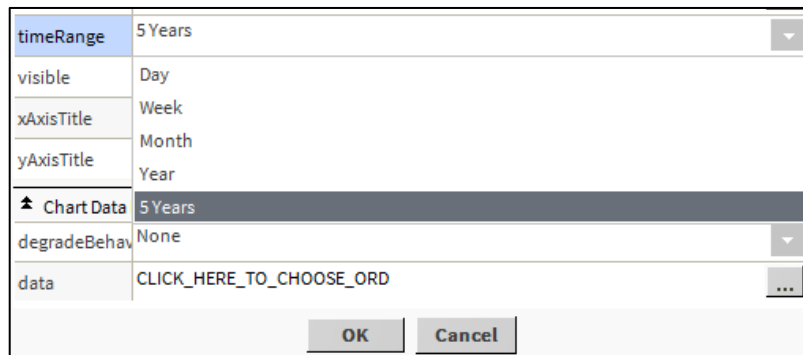


Figure 54 - EXAMPLE OF THE TIME RANGE BEING SET

6. Select the 'ord' to add aggregator to the chart.
7. Click 'OK' to save the changes and toggle the page to view mode.
  - a. The chart should display the data in 5 years' time range as shown below in the Bar chart

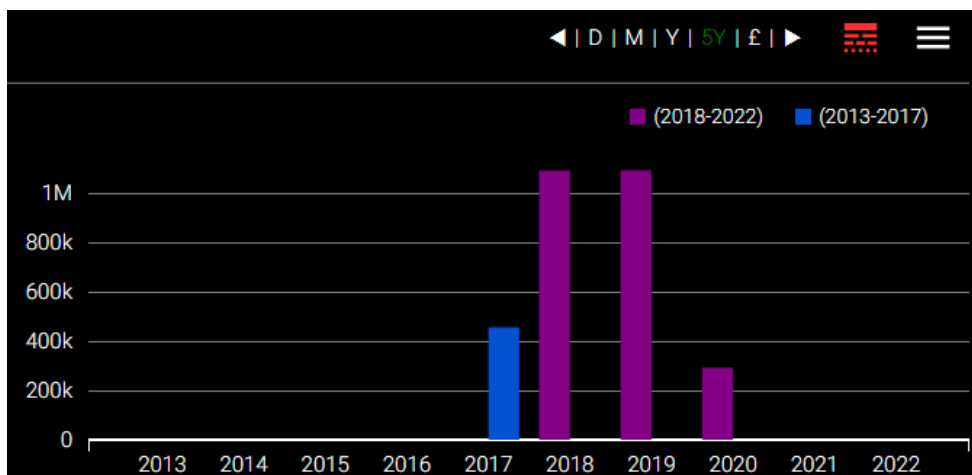


Figure 55 - EXAMPLE OF A BAR CHART DISPLAYING A 10YEAR PERIOD

## 11.9 Chart Relativization

Relativization is a process of binding SAIA PCD widgets to relative ORD's following a naming convention. It is possible to design a common px page template with relativized ORD's and assign it as a view on multiple folders, to avoid duplication and reduce errors.

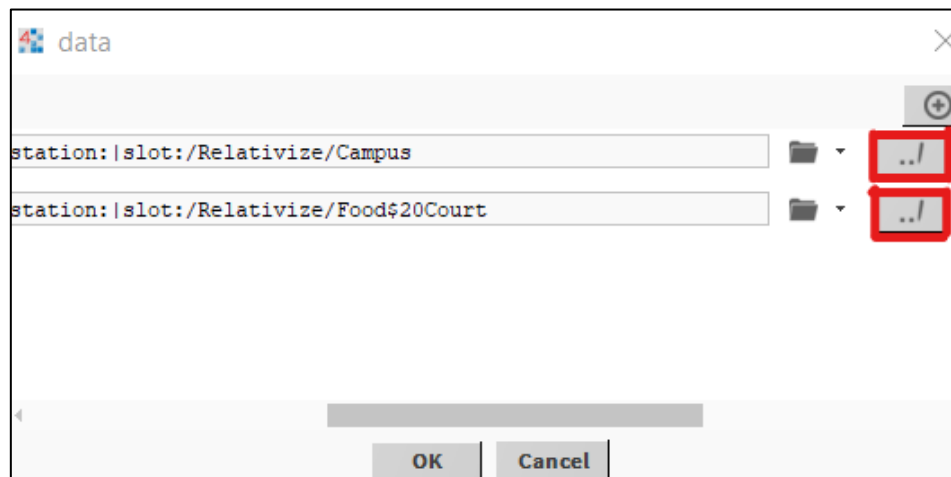
Saia PCD Supervisor EM charts can be bound to relative and absolute aggregator ORD's. ORD's could be relativized manually or by using chart data binding popup

Precondition:

- Create new folder (called e.g. Relativize) with px view
- Ensure aggregators for the charts site under the folder

Steps to create relativize chart:

1. Add line, bar, pie, ranking and stacked bar chart to the px page.
2. Double click on each of the charts.
3. Select the ORD chooser
4. Add aggregators to the chart.
5. Click on the 'relativize' button and select 'OK' to save changes.



**Figure 56 - EXAMPLE RELATIVIZED FOLDER**

6. Navigate config>Relativize folder
7. Duplicate the folder
8. Change e.g. the units on any of the aggregators from the original folder

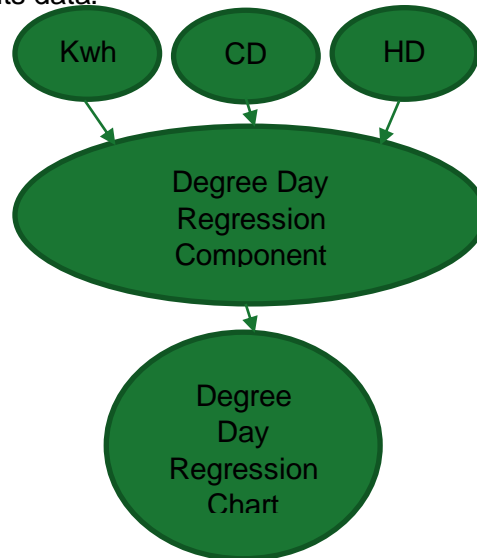
The changes to the aggregator unit should only apply to the charts in original folder.



## 11.10 Degree Day Regression Chart

The Degree Day Regression Analysis chart is a representation of degree days (Heating Degree Days and Cooling Degree Days) and energy consumption.

The diagram below represents the data flow that allows the Degree Days Regression Component to calculate its data.



The Degree Day Regression chart has three steps to engineer. Firstly, **Degree Days Aggregators** must be present in the station – these differ from standard Aggregators. Secondly, the **Degree Day Regression** component must be added to a station. This is where the Aggregators are configured. Finally, the **Degree Day Regression Chart** needs to be added to a PX Page. When the data property is configured, the component previously configured will be used as the data ORD.

## 11.11 Degree Day Aggregator

The Degree Day component inputs temperature and baseline temperature with the output of Degree Days. Although the Degree Day Component isn't a chart, it can still be linked to a chart allowing the processed data to be presented on a chart.

The component would need to be bound to an OAT (Outside Air Temperature).

### Property Sheet of the Degree Day Aggregator

Property Sheet

DegreeDay (Degree Day)

UId 6019cfad-1ddb-4917-ba1e-6f9df891da40

Facets units=null,costPerUnit=1.00

Overall - {null}

Current Hour - {null}

Last Hour - {null}

Current Day - {null}

Last Day - {null}

Current Week - {null}

Last Week - {null}

Current Month - {null}

Last Month - {null}

Current Year - {null}

Last Year - {null}

Degree Day Type Heating Degree Day

Base Temperature 15.50

EvMeter Exception in Ord: null

Ord null

Figure 57 - DEGREE DAY COMPONENT PROPERTY SHEET (NOT CONFIGURED)

- **Facets** – The unit of the data.
- **Degree Day Type** – Switch between Heating and Cooling Degree Days.
- **Base Temperature** – Enter the base temperature of the building.
- **Meter**
  - **Ord** – Link to the OAT (Outside Air Temperature) aggregator.

## 11.12 How to Engineer the Degree Day Aggregator Component

1. **Drag and drop** the Degree Day Component from the Palette into the wiresheet on which the chart will be displayed.
2. **Double click** on the component.
3. The first setting to change is **Ord**.
  - a. **Click** the drop-down arrow next to the **Folder Icon**.
  - b. **Select** Component Chooser.
  - c. **Navigate** to the OAT (Outside Air Temperature) aggregator.
  - d. **Select** it.
  - e. **Click OK**.
4. Enter the **Base Temperature** for the building.
5. Ensure the correct **Degree Day Type** has been selected.

## 11.13 How to Engineer Degree Day Regression Component

1. **Drag & drop** the component in the page folder.
2. **Double click** on the component to open the property sheet. (Figure 20)
3. The **Ord** link fields will appear **null**.
  - a. **Heating Degree Day** – Use the drop-down icon next to the folder icon
    - i. select **Component Chooser**
    - ii. Navigate to the **Heating Degree Day** aggregator
    - iii. Click **OK**.
  - b. **Cooling Degree Day** – Use the drop-down icon next to the folder icon
    - i. select **Component Chooser**
    - ii. Navigate to the **Cooling Degree Day** aggregator
    - iii. Click **OK**.
  - c. **Energy** – Use the drop-down icon next to the folder icon
    - i. select **Component Chooser**
    - ii. Navigate to the **Total Energy** aggregator
    - iii. Click **OK**.
4. Using the drop-down menu, select the **Time Range**.
5. Click **Save**.
6. Open the Px Page the **Degree Day Regression Chart** will appear on.
7. Select **Edit Mode**.
8. **Drag & Drop** the **Degree Day Regression Chart** onto the **Px Page**.
9. **Double Click** on the chart.

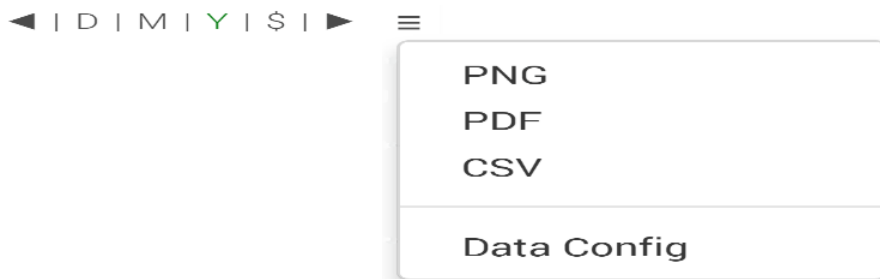


Figure 58 - DEGREE DAY PROPERTY SHEET

10. **Heating Degree Day** – A link to the Aggregator for Heating Degree Day.
11. **Cooling Degree Day** – A link to the Aggregator for Cooling Degree Day.

- 12. **Energy** – A link to the Aggregator for energy consumption.
- 13. **Time Range** – Use this setting to define the range of time.



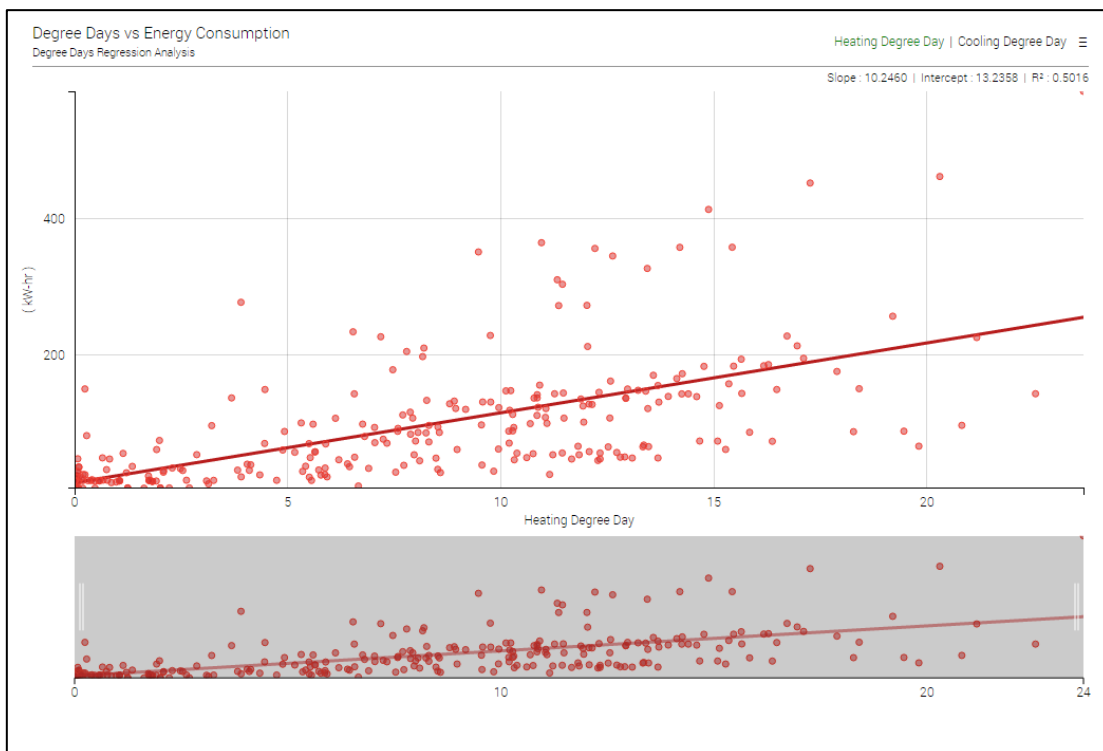
The **Degree Day Regression** components Property Sheet can be accessed via the Workbench or a web browser. If you wish to use a web browser, you will need to have access to the Property Sheet and the File Structure.

### Properties

The Degree Day Regression chart does not have any further unique properties. See Line Chart.



The Data Config of this chart works by setting the ORD to a **Degree Day Regression** component as described in the **How to Engineer Degree Day Regression Component** above.



**Figure 59 - EXAMPLE DEGREE DAY REGRESSION CHART**

## 11.14 Kiosk Mode

The Kiosk Mode is a full-page widget that allows predefined pages to carousel with a predefined timer. The widget needs to be engineered on its own full page, with the width & height of the widget slightly larger than the PX pages to avoid scroll bars.

### Engineering the Kiosk Mode

1. In the station, create a new folder for the Kiosk Mode.
2. On the Kiosk Mode folder, create a new view.
3. Ensure edit mode is enabled, double click on the PX page and make the width and height of the page 15 pixels higher and wider than the other PX pages in the station.
4. Open the SAIA PCD SUPERVISOR EM palette.
5. Drag & drop the Kiosk widget onto the page.
6. Resize the widget to the full width & height of the page.
7. Double click on the component to access the property sheet.
8. Starting from kioskPage01, begin selecting the ord of the pages to be displayed.
9. Use the ‘...’ button next to the field – select the folder with a view already assigned.
10. In the property sheet, ensure other settings are accurately set up. For example, ensure that the timer field (measured in seconds) correct.
11. Click Ok.

### Properties

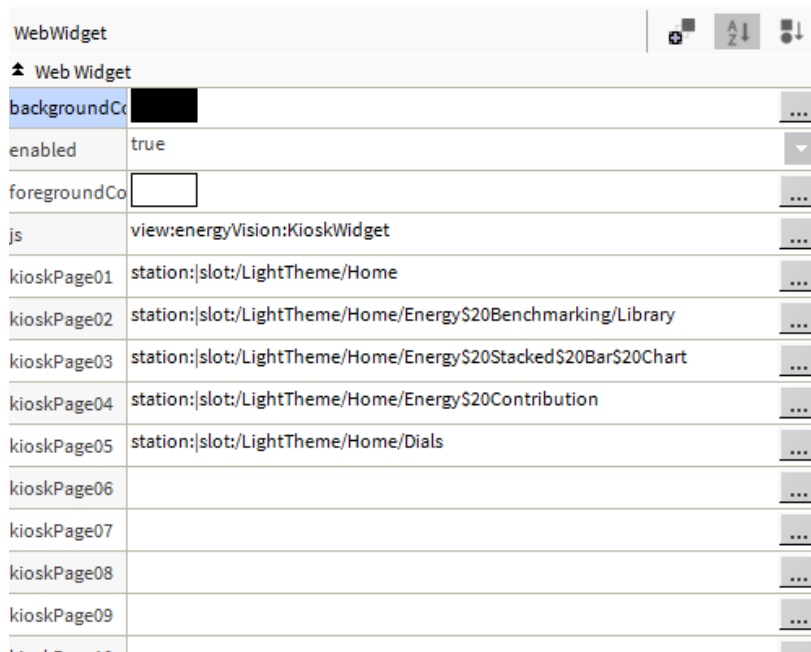


Figure 60 - EXAMPLE PROPERTY SHEET

- **KioskPage01-20** – select the ORD of the view you wish to be displayed on each Kiosk Page

- **ShowArrows** – show the arrows to manually move between kiosk pages
- **Timer** – the duration of each kiosk page



A Kiosk Page is not designed to be interacted with or navigated from. We recommend loading the Kiosk Page and once it is no longer needed closing that browser page or tab.

## 11.15 Gauges & Dials

Gauges & Dials differ from the previous Charts in a fundamental way: they are **not** linked directly to aggregators. Instead, they are linked to a **numeric writeable**. That, in turn, is linked to an aggregator and placed on the **wiresheet** of the **Px Page** it resides on. In the property sheet, as with the Chart Widgets, the gauge or dial display properties will be displayed first, with the values in the left column and the configurable value in the column on the right. In the **Wb View Binding** section below, the ORD value needs to be set to the **numeric writable** discussed above.

### How to Engineer the Gauges & Dials

1. On the Px Page wiresheet where the Gauge / Dial is being placed, place a Numeric Writeable.
2. Link the Numeric Writeable to the desired output of the aggregator.
3. The Numeric Writeable should now be displaying data from the aggregator.
4. Go back to the Px Page where the Gauge / Dial is placed.
5. Double Click on the Gauge / Dial to open the Property Sheet.
6. Populate the customisable fields (as explained above).
7. In the ord field, click Null.
8. An ord selection box will now appear.
9. Click the drop-down arrow next to the folder.
10. Select Component Chooser.
11. Navigate to the Numeric Writeable that has just been to the aggregator. Select it.
12. Click 3x Ok prompts.
13. The Gauge / Dial will now be displaying the data being pulled through from the aggregator via the numeric writeable.

## 11.16 Segments Dial

The Segments dial displays a numeric value on a circular gauge split into a calculated number of segments. The segments are coloured by assignment of a low, medium and high colours. The thresholds at which these colours start are also configurable. The result is a dial where it possible to see when a value is reaching pre-defined limits.

### Properties

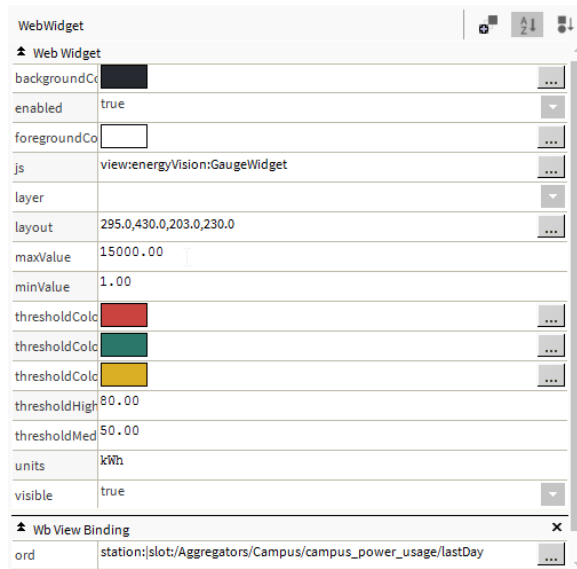


Figure 61 - EXAMPLE PROPERTY PAGE

- **MaxValue** – The maximum value the dial will show, allows the dial to scale correctly.
- **MinValue** – The minimum value the dial will show, allows the dial to scale correctly.
- **ThresholdColourHigh** – The colour of the high threshold value segments
- **ThresholdColourLow** – The colour of the low threshold value segments
- **ThresholdColourMedium** – The colour of the medium threshold value segments
- **ThresholdHighPercentage** – Percentage of the maximum value at which the high threshold will start
- **ThesholdMediumPercentage** - Percentage of the maximum value at which the medium threshold will start
- **Units** – Alters the Si Unit type measured on the dial.
- **Ord** – Link to the numeric writeable.

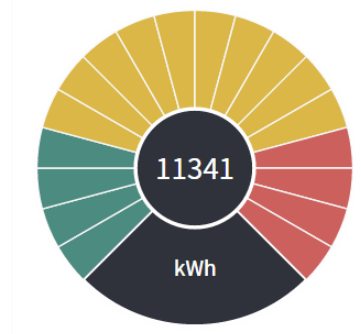


Figure 62 - EXAMPLE SEGMENT DIAL

## 11.17 Bar Gauge

The Bar Gauge displays a numeric value on a horizontal bar. The minimum and maximum value are configurable, along with the number of segments in the bar. The threshold colouring and limits can also be set the same as the segments dial.

### Properties

- **NumberOfSegments** – the number of segments in the dial
- **Text** – the text to show under the gauge

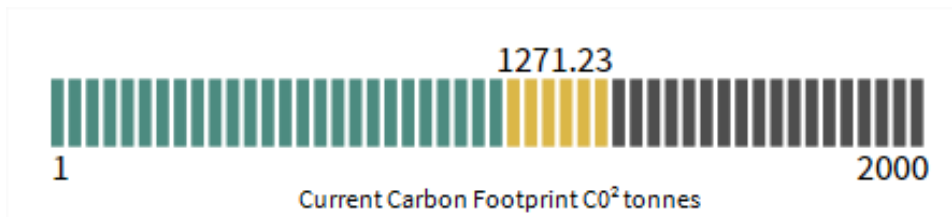


Figure 63 - EXAMPLE BAR GAUGE

## 11.18 Needle Gauge

The needle gauge displays a numeric value on a circular gauge with the value shown in its numeric form within the gauge. The minimum and maximum value are configurable, along with the unit type – which is displayed within the dial.

There are three Needle Gauge's available in the SAIA PCD SUPERVISOR EM palette file: Needle Gauge Green, Needle Gauge Yellow and Needle Gauge Red. These offer the same functionality, but the background coloured the dial are the respective colour contained within the widget name (i.e. Green, Yellow and Red).

### Properties

- **DialColour** – The colour of the dial part of the widget

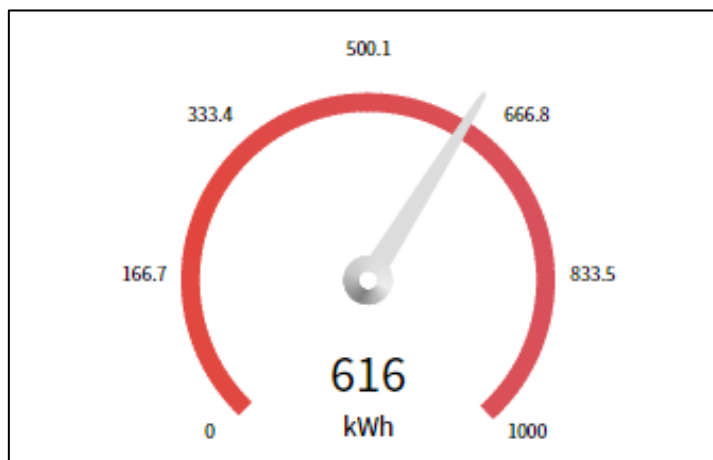


Figure 64 - EXAMPLE NEEDLE GAUGE



## 11.19 LED Dial

The LED Dial displays a numeric value in a circular gauge. The gauge is split into small segments and each one is 'lit' up to give an LED effect when the value is passed.

There are three LED Dials available in the SAIA PCD SUPERVISOR EM palette file: LED Dial Green, LED Dial Yellow and LED Dial Red. These offer the same functionality but the LED segments of the dial are the respective colour contained within the widget name (i.e. Green, Yellow and Red).

### Properties

The LED Dial does not have any further unique display properties (See Segments Dial and Line Chart for those).

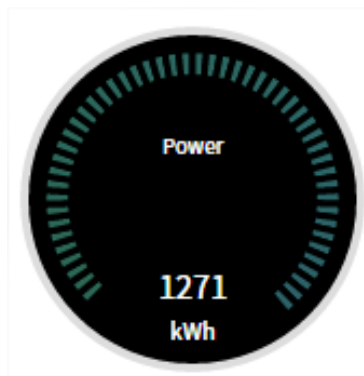


Figure 65 - EXAMPLE LED DIAL

## 11.20 CSV Import

The CSV Import function enables your historic meter data to be imported into Saia PCD Supervisor EM to manipulate the data into functional graphs and charts.

The CSV importer allows you to :

- Import data from CSV files into a new SAIA PCD history
- Merge data from CSV files with an existing history
- Run CSV imports on a schedule periodically.

Copy the relevant CSV file to the target PC. Steps to setup csv importer and import csv file:

### Precondition:

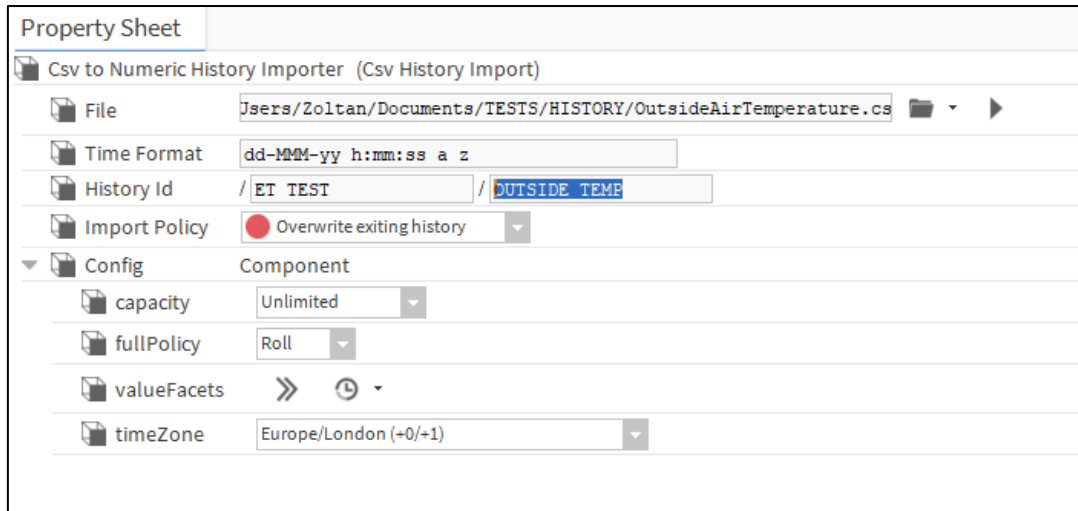
1. Ensure the time zone on the csv Importer component matches time zone on SAIA PCD platform.
2. Ensure the time format on the csv Importer component matches the time format on the csv file.

### Steps:

1. Navigate to config and create a **new folder** called 'csv import'.
2. From the palette, search for 'Energy Manager' and expand Aggregator folder
3. Add 'CSV to Numeric History Importer' component to the csv import folder created in step 1.

4. Navigate to files and create a new folder called 'csv'.
5. Copy the csv file to import to the csv folder in step 4.
6. Navigate config>csv import and double click on 'CSV to Numeric History Importer'

The property sheet page for the component should be open as shown.



**Figure 66 - EXAMPLE PROPERTY SHEET**

7. Select the file from the PC -> use **File Ord Chooser** from the drop-down menu
  - i. Set **Time Format** to match the time format on the csv import file.
  - ii. Set 'timeZone' to match the timeZone on the SAIA PCD platform.
  - iii. Click on 'Save' to save the changes.
  - iv. **Right click** – Actions – execute
  - v. The csv file should be imported successfully, and the import data can be found under the following path. Station/History/parent/child  
**EG: (EnergyVisionDemo actual running station)/History/ET TEST/OUTSIDE\_TEMP**

Commonly used date time formats.

y = year (yy or yyyy) (96 or 1996)	a = Am/Pm marker
M = month (MM).	s = seconds (ss)
d = day in month (dd)	S = milliseconds (SSS)
h = hour (0-12) (hh)	Z = time zone text (e.g. Pacific Standard Time...)
H = hour (0-23) (HH)	Z = time zone, time offset (e.g. -0800)
m = minute in an hour (mm)	

#### Day (d):

Days in a month. [1 ~ 28,29,30,31]

1,2,3 ~ 31 ==> d or dd

01,02,03 ~ 31 (padded) ==> dd

#### Month (M):

Month in the year. Number of M's determine length of format (e.g. MM, MMM or MMMMM)

1~12 ==> M

01,02~12 (padded) ==> MM

Jan, Feb ~ Dec ==> MMM

January ~ December ==> MMMMM

#### Year (y):

1998 ==> yyyy

12 (2012) ==> yy

98 (2098) ==> yy

#### AM/PM (a):

28-09-89 3:00 AM ==> dd-MM-yy h:mm a

#### Pattern Example

dd-MM-yy 31-01-12

dd-MM-yyyy 31-01-2012

MM-dd-yyyy 01-31-2012

yyyy-MM-dd 2012-01-31

yyyy-MM-dd HH:mm:ss 2012-01-31 23:59:59

yyyy-MM-dd HH:mm:ss.SSS 2012-01-31 23:59:59.999

yyyy-MM-dd HH:mm:ss.SSSZ 2012-01-31 23:59:59.999+0100

## 12 Navigation Menu

The Navigation Menu folder in the Saia PCD Spervisor EM Palette contains two widgets: the **Vertical Menu** and the **Menu Builder**.

### 12.1 Vertical Menu

The Vertical Menu can be used for navigation within your station, between defined PxPages.



The Vertical Menu widget should be added to a single PxPage and configured. You can then use this as a PxInclude page on any page you wish to see the Navigation Menu.

#### Properties

- **IconDefaultColour** – The default colour for icons.
- **IconSelectedColour** – The colour of the icon once selected.
- **MenuItemHeight** – The individual height of each menu item.
- **MenuStyle** – Choose display from both **Icon and Text**, just **Icon** or just **Text**.

The data configuration is different from the other Chart Widgets. Instead of being presented with the data configuration popup, you need only select a .menu file.



**.menu** file contains the definition for your menu hierarchy, naming, icons and link destinations. It is an JSON format which you could create yourself using the demo stations menu as a starting point. Alternatively, the Menu Builder will create this file for you through a graphical interface.



When copying the demo stations menu, the editor profile must be in **Ax Text Editor**. To achieve this, in the top right-hand corner the default editor would be **Text Editor**, click this and select **Ax Text Editor**.

## 12.2 How to Engineer the Menu

1. Create a folder in the Files folder called Menu.
2. Open the Menu folder, right-click & select New -> TextFile.txt.
3. Name that TextFile.txt -> (InsertName).menu.
4. Below is an example of the demonstration's menu structure.
5. Edit the menu & menu structure depending on project requirements.
6. Save the newly edited menu structure.
7. Open up the Px Page on which the menu will be placed.
8. Drag & drop the menu widget from the SAIA PCD SUPERVISOR EMPalette onto the Px Page.
9. Double-click the menu widget on the Px Page.
10. Click on the ord field.
11. A pop-up will appear. Click on the folder.
12. Navigate & select the .menu file.
13. Click Open.
14. Click Ok.
15. Click Ok.



Figure 67 - EXAMPLE MENU

## 12.3 Menu Builder

The Menu Builder has been designed to allow engineers to build a menu structure, without the need for any coding experience. The Menu Builder is a widget, the same as the other widgets of SAIA PCD SUPERVISOR EM and resides in the SAIA PCD SUPERVISOR EM Palette.



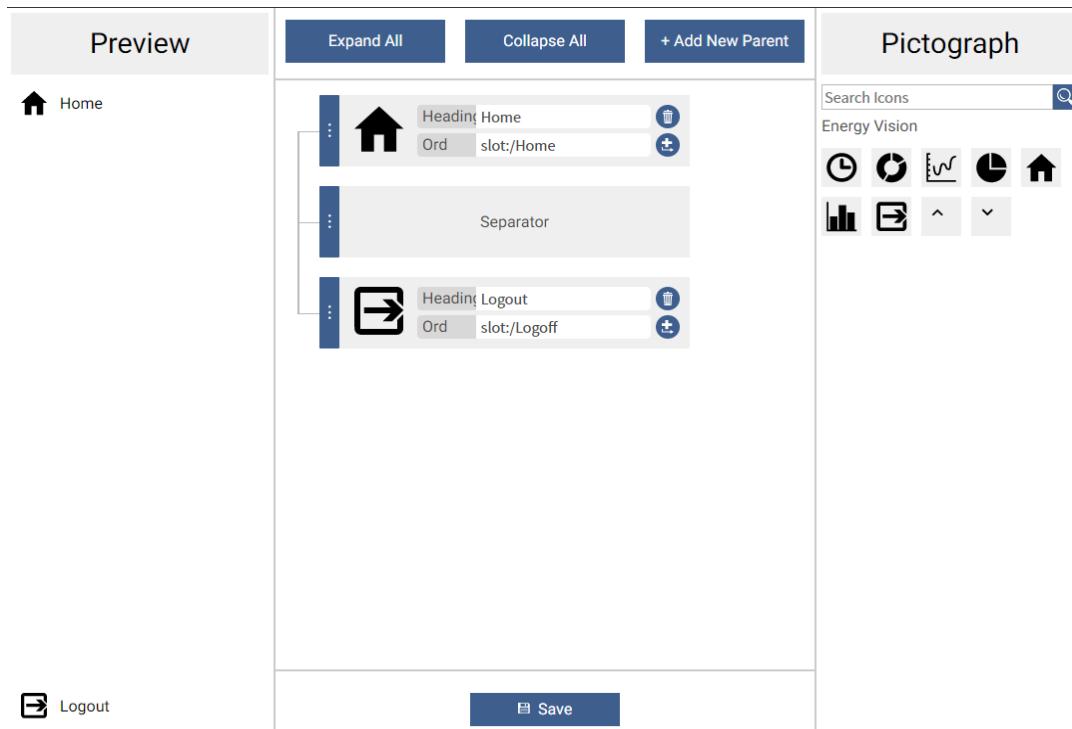
Although the widget can be used in a browser, SBC recommend creating a Px Page within Workbench, engineering the Menu using the Menu Builder, saving the file, then deleting the Px Page. We recommend this because, although the Menu Builder can be used to reorganise the Menu structure in a browser, individual end users could change the hierarchy of the menu which could complicate the setup of a finished station.



The Menu Builder will create the necessary code to enable to Vertical Menu widget to work and a Menu hierarchy to be built, however, the .menu file still needs to be manually created. Once the blank .menu file has been created, the Menu Builder can start to implement the code as the engineer starts to build the Menu.

## 12.4 How to Engineer the Menu Builder

1. Create a temporary Px Page in your Px folder. Ensure that the width of the Px Page matches the width of the Px Include as the Menu Builder is a large widget.
2. In the Menu folder (created in the previous Menu Section) ensure there is either a blank .menu file in there or an existing .menu file is in there (if using an existing .menu file, ensure the .menu file is complete and valid, if the code isn't correctly engineered, the Menu Builder will not work).
3. With the Px Page in edit mode, drag & drop the Menu Builder widget onto the Px Page.
4. The Widget will now display Please add an ord to the menu file.
5. Double Click on the widget to open the property sheet.
6. At the bottom of the Property Sheet, **find the Ord** field.
  - a. **Click** either the **null** field or the ... at the end of the **Ord** row.
  - b. The **Ord Chooser** will open.
7. Using the drop-down arrow located next to the folder icon, select File Ord Chooser.
8. In the File **Ord Chooser** pop-up, navigate to your .menu file.
  - a. Select the file & open.
9. Click **Ok**. Click **Ok**.
10. The Menu Builder will now appear.
  - a. **If an empty .menu file was used:** The Menu Builder will appear with 3 items in the menu structure.
  - b. **If a pre-coded .menu file was used:** The Menu Builder will open with the structure of the .menu file.
  - c. **If an incorrectly coded pre-coded .menu file was used:** The Menu Builder would not load.



**Figure 68 - Menu Builder with a blank .menu file**

**Preview:** The Preview window gives the engineer a live preview of what the menu will look like when in a station. The preview window will react immediately to any changes made to the menu. The hyperlinks in the preview window have been disabled so users do not accidentally move away from page prior to saving. However, the engineer can still explore child menu items when clicking on the parent menu item.

**Expand All:** The Expand All button will expand all the menu items.

**Collapse All:** The Collapse All button will collapse all the menu items.

**+ Add New Parent:** The + Add New Parent button will add a new parent menu item to the menu.

**Trash Icon:** The Trash Icon will delete the menu item.

**+> (Below Trash Icon):** This button will add a new child menu item to that menu item.

**Separator:** The separator will split the menu items above and below it, placing the item below it to the bottom of the menu. For example, the Log Out button.

**Pictograph:** The library of icons available to use within the menu.

**Save:** Save the changes to the .menu file.



## 12.5 Using the Menu Builder

The Menu Builder has been engineered around the Drag & Drop principle. To reorganise the Menu structure, drag & drop the menu item to the desired location in the menu and the Preview window will update accordingly.

### 12.5.1 Adding an Icon

To add an image, choose an image from the Pictograph and drag & drop it onto the square to the left of the **Heading & Ord** field.

#### Creating a Child Menu Item

Drag & Drop the Parent Menu Item (the Menu Item to become a Child) under the Parent Menu Item.

Or, click the **+>** (under the Trash Icon) and a Child Menu Item will be added.

#### Adding a Heading & Ord

In the Workbench view, ensure the folder structure is visible in the navigation window. Now, drag & drop the Folder into the box to the left of the **Heading & Ord** field. Both fields will now be automatically populated.

If only the **Heading**, or **Ord**, names/link need to be added, drag & drop the folder onto the respective field.

## 13 Data Quality

Users can now view the integrity of the data displayed within charts via a 'Data Quality' icon placed to the top right of most charts (not applicable to Regression and the HeatMap charts). The button's colour changes based on the minimum integrity value returned from the data set being displayed on the chart.

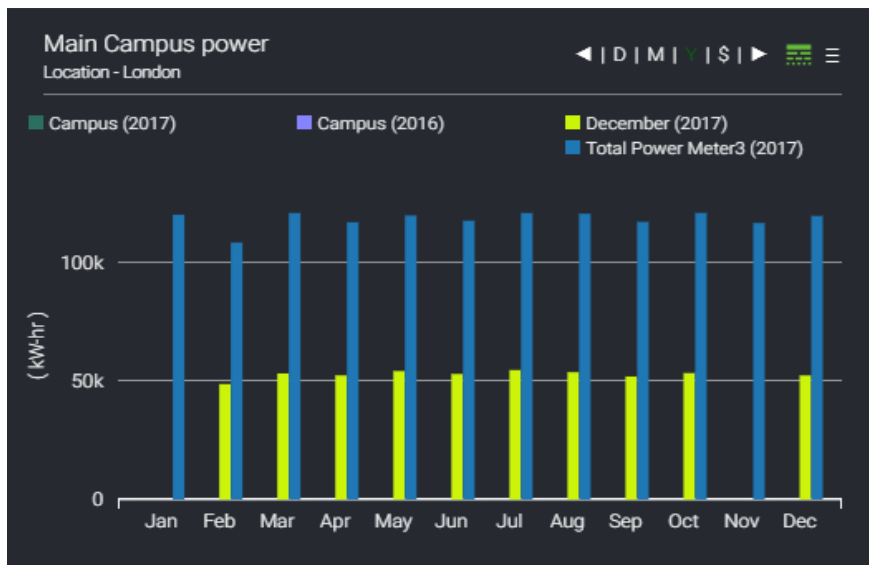


Figure 69 - EXAMPLE DATA QUALITY ICON

A simple colour code system [red, amber, green] is used to show the integrity of the data between 80-100% scale. An integrity level below 80% remains red.

Colour scale example:



Figure 70 - EXAMPLE DATA QUALITY COLOUR SCALE

Hovering over the Data Quality button will display a tooltip. This contains the following information:

- The minimum integrity from the series currently displayed
- The number of Offline Meters
- The number of Inactive Meters

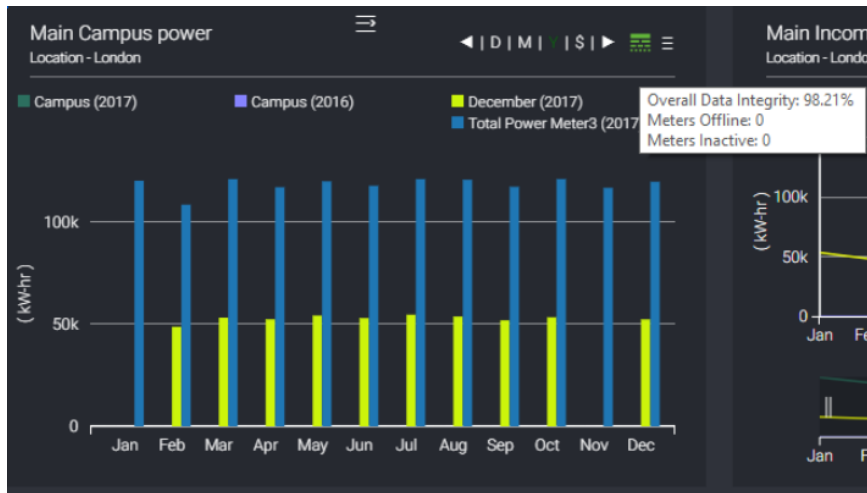


Figure 71 - EXAMPLE DATA QUALITY HOVER OVER

### 13.1 Data-Quality Popup

Clicking on the Data Quality button will bring up another window containing more in-depth information regarding the integrity of the data. Users will see a tab for each series in the chart, with each tab displaying a graph of the integrity, broken up over a more detailed time period. For example, if the main chart is set to 'year', the integrity chart will show the data broken down by month, if the main chart is set to 'month' data will be shown in days and if the main chart is set to 'day' mode then the integrity chart will show the integrity broken down into hours.

Yearly integrity popup Year example:

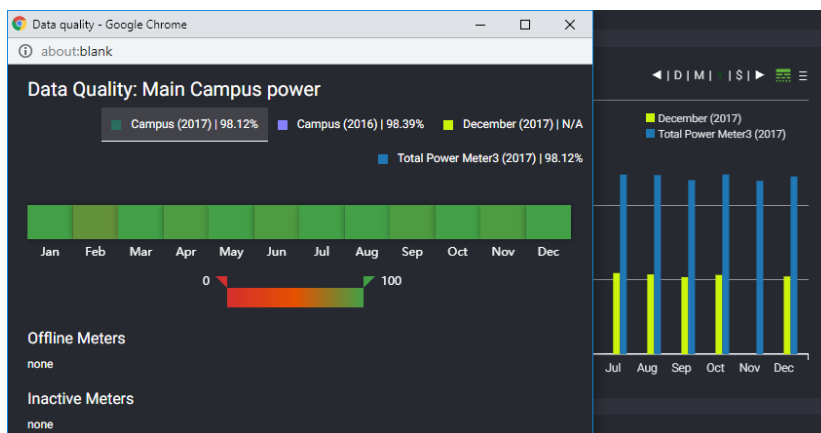
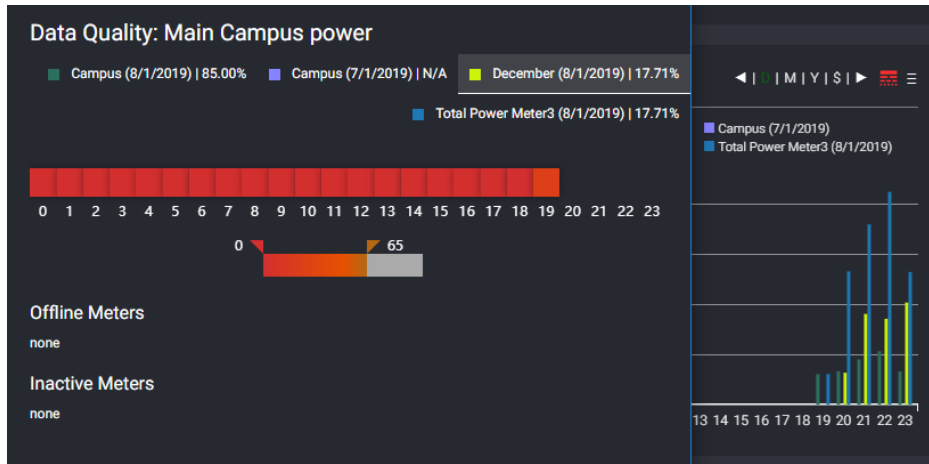


Figure 72 – EXAMPLE DATA INTEGRITY POP UP

Data quality popups include an adjustable slider that can be used to show or hide the data entry on the chart. It can be set between 0 and 100 to analyse the daily, monthly or yearly data integrity on the selected data-set.



**Figure 73 - ADJUSTABLE SLIDER BAR**

In addition to this, inactive or offline meters are also displayed.



**Figure 74 - DISPLAY OF INACTIVE / OFFLINE METERS**

### 13.2 Data-Quality Alarms

The aggregators can be setup to raise alarms when a meter is detected as offline or the data integrity falls below 80%. The alarms status is evaluated every time an aggregator calculates.

An alarm is raised if any of the following conditions are fulfilled,

- Data integrity value is less than a threshold (80 - hardcoded).
- If a meter is currently offline – no reading for last two data collection cycles.
- If a meter is inactive - last 20 meter values has not changed.

The alarms feature can be controlled at a service level and at an individual aggregator level. All alarms can be turned off globally or alarms from individual aggregators can be disabled using the “Data Quality Alarms” section in the aggregator property sheet.

A global inhibition period can be applied to pause the alarm generation on station start up for a certain time period. This help’s to avoid a flood of alarms on station start-up.

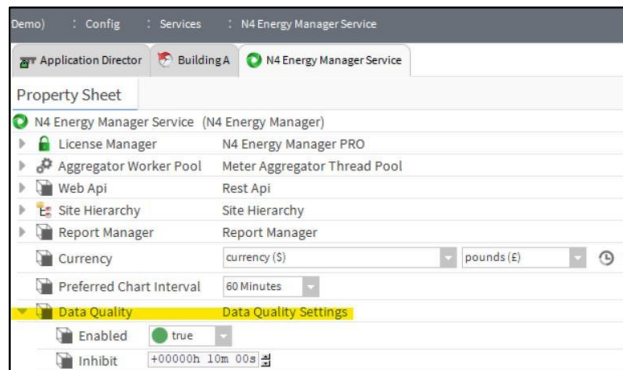


Figure 75 - EXAMPLE OF THE ALARM SERVICE DQ SETTINGS

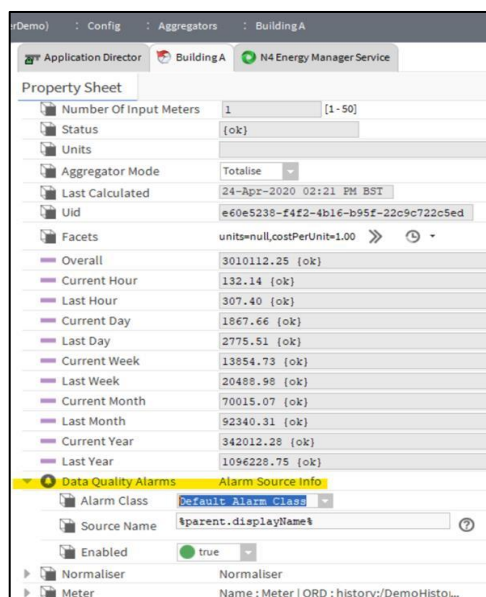


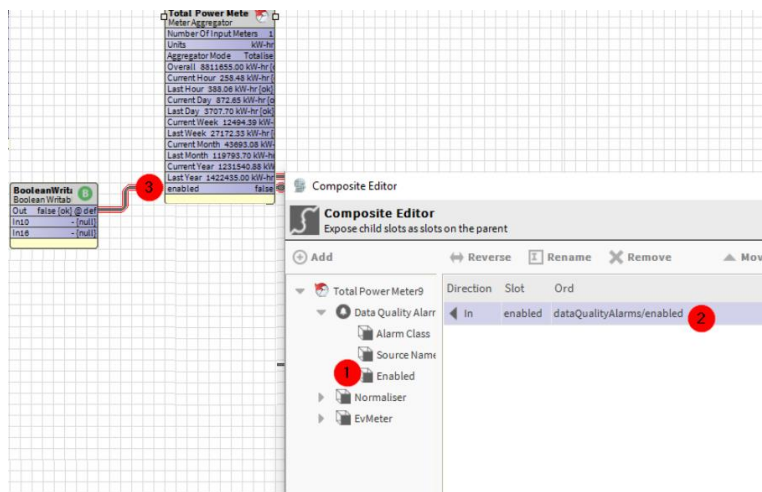
Figure 76 - EXAMPLE AGGREGATOR ALARM SETTING

In order to handle special cases (e.g. having a heating- / cooling aggregator) that not reading data over a period of time, it is possible to enable / disable the data quality via a datapoint

In order to do so it is required to add this attribute via “Composite Editor” to the Aggregator

Steps needs to be taken

1. Expose the enabled slot on the aggregator using the composite editorLink
2. Link the enabled slot to a Boolean writable using the wiresheet view
3. Add additional wiresheet logic to enable / disable data quality alarms dynamically



## 14 Energy Vision to Saia PCD Supervisor EM Migration Tool

The migration tool converts stations using energyVision modules to use Saia PCD Supervisor EM. The tool will convert all energy vision components to their Saia PCD Supervisor EM counterparts, retaining all user configuration and product features.

### Prerequisites:

- Install **energyVision Energy Manager Migrator.jar** module
- The station folder and the workbench used for migration are required to be present on the same machine.
- Create a backup of the station to be migrated.
  - If the station is present on a JACE, transfer the station to a supervisor machine.

### Migration Steps:

Open the migration tool available under the workbench Tools option.

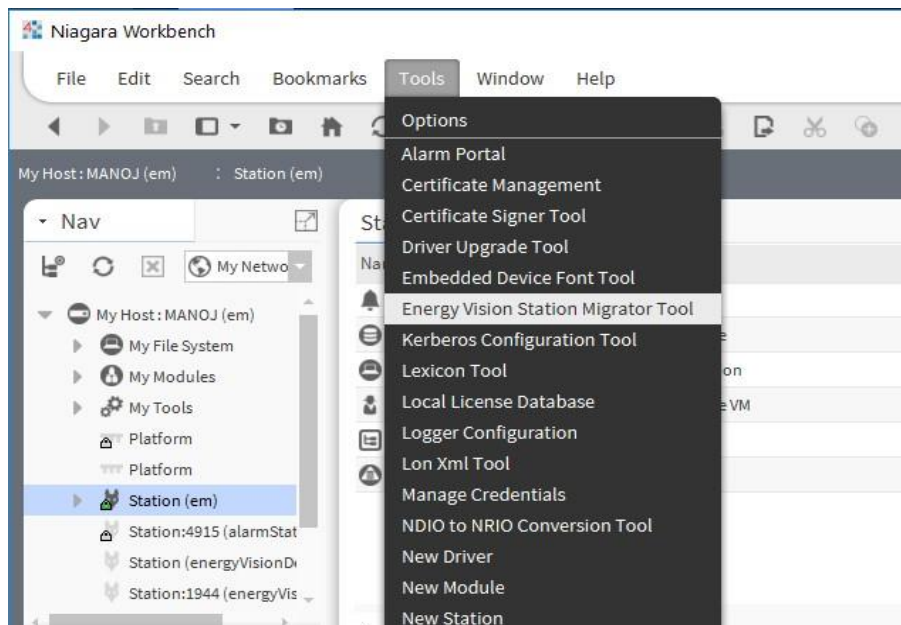
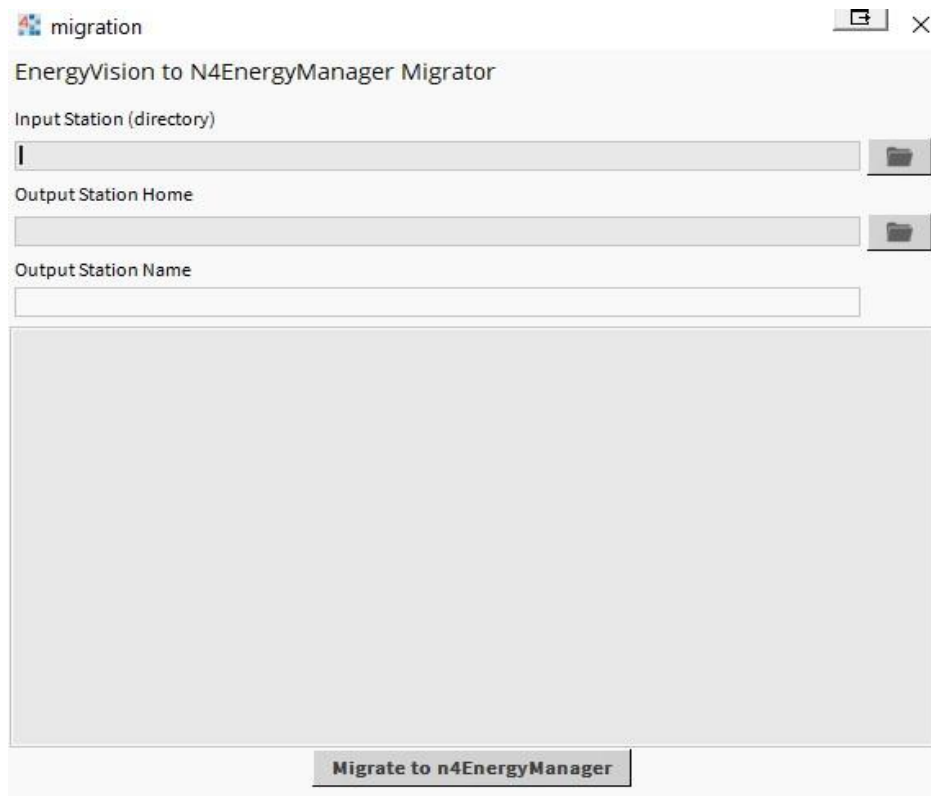


Figure 77 EXAMPLE OF OPENING MIGRATION TOOL



**Figure 78 MIGRATION TOOL**



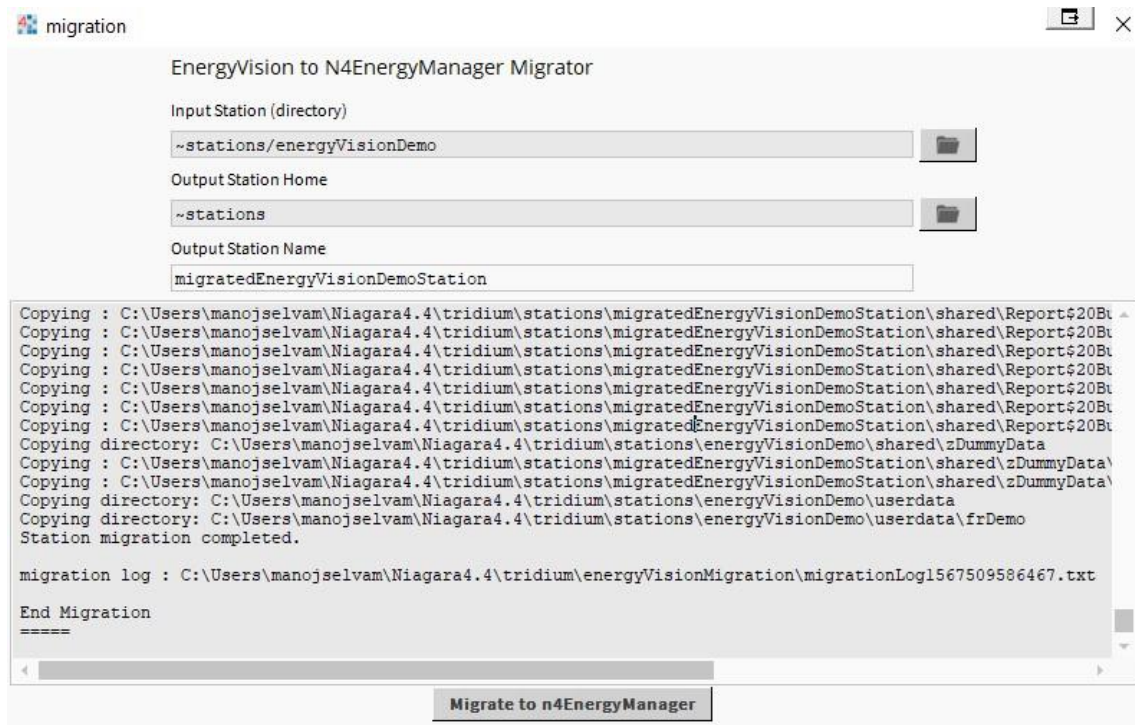
The migration is performed on a copy of the input station, The source station files would remain untouched once the migration is complete.

**Properties:**

- **Input Station (directory):** Path to the input station directory - The station to be migrated
- **Output Station Home:** Path to the directory where a new migrated station folder would be created.
- **Output Station Name:** Name of the new migrated station.

Click **Migrate to Energy Manager** to run the migration. On successful migration, a new station with user-specified **Output Station Name** would be created under **Output Station Home** folder.





**Figure 79EXAMPLE OF A SUCCESSFUL MIGRATION**

On successful migration, a log detailing the migrated components is created in the **SAIA PCD User Home**.

#### Running the migrated station:

- Rename the migrated station to the to match the source station name if needed.
  - This step could be performed during the station transfer process if using station copier.
- Uninstall all energyVision related modules.
  - energyVision-[rt,ux,wb].jar
  - enregyVisionResources-[rt-ux].jar
  - energyVisionReports.jar
- Ensure Energy Manager modules are installed.
- Start the station using the application director.
- Perform tests on the station to ensure its normal operation.
  - Test if histories have been migrated over
  - Tests if \*.px have been migrated and accessible

## 15 Activating the 60-minute Pro trial

To activate pro features for a 60-minute period:

1. Run a work bench with 'Saia PCD Supervisor EM core license'
2. Navigate Config>Services>Energy Manager Service.

The page below should be displayed with Saia PCD Supervisor EM Core (Free)



Figure 80 - EXAMPLE PROPERTY SHEET – CORE LICENSE

3. Right click on 'License Manager' and select Action>Enable Trial 60 minutes trial for Pro features should be activated as shown below.

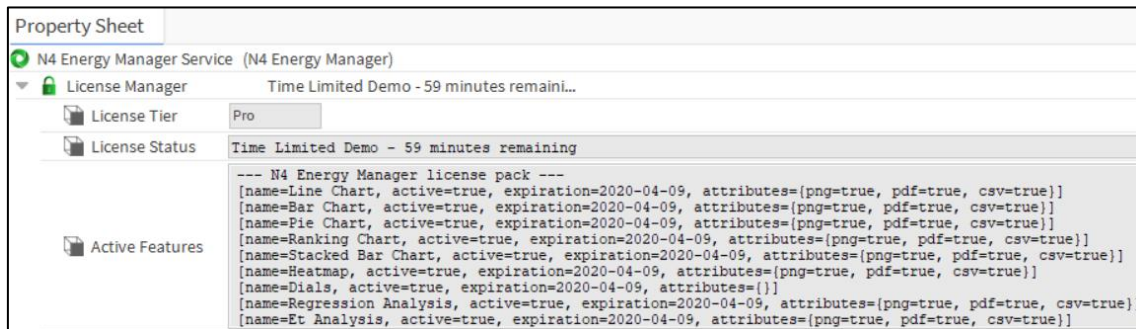


Figure 81 - EXAMPLE PROPERTY SHEET - 60 MIN PRO TRIAL

## 16 Error Logging and Usage Analytics

We collect anonymised error logs and usage analytics to improve the quality of the product and fix issues proactively. The feature is disabled by default for all users and enabled only when the user has provided consent. The users will be presented with an option to provide consent when they visit a px page with an Saia PCD Supervisor EM widget.

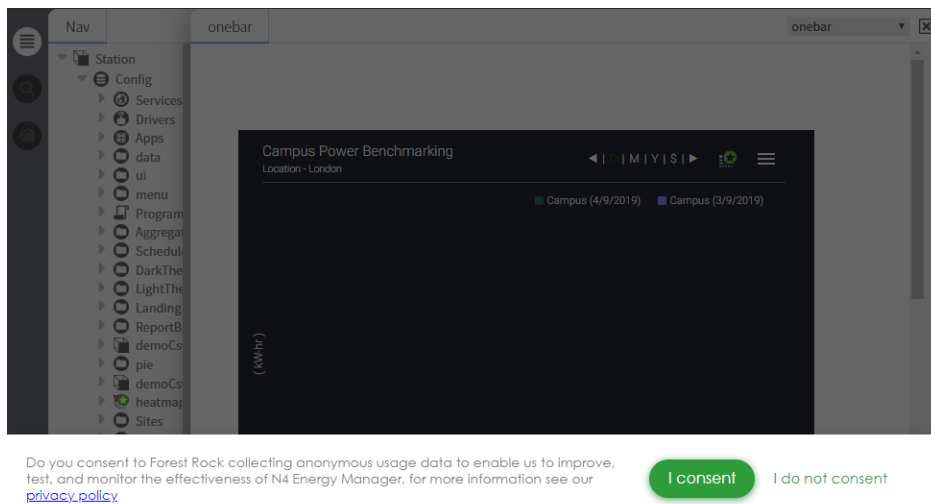


Figure 82 DIALOG REQUESTING USER CONSENT

User preferences could be changed on station, through the Energy ManagerPrivacy options available under every user in user services.

**Properties:**

**Accepted:** Has the user accepted the privacy consent

**Request Consent:** If set to True the user will be presented with the consent dialog in the browser.

**Last Updated At:** Last Time the settings were updated.

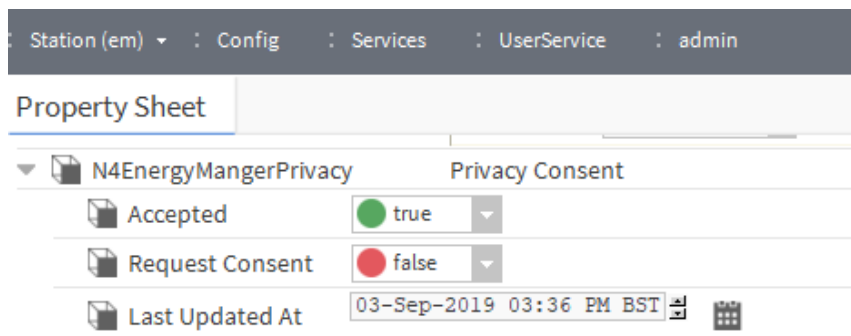
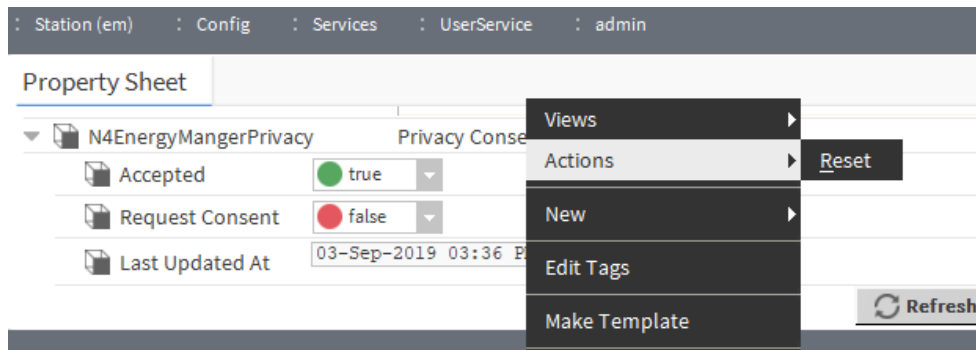


Figure 83 EXAMPLE OF A USER WHO HAS ACCEPTED THE PRIVACY CONSENT

The privacy consent can be reset for a user using the Reset Action.



**Figure 84 OPTION TO RESET USER CONSENT**

## 17 Troubleshooting

**I am using a 32-bit Installation of SAIA PCD and SAIA PCD SUPERVISOR EM does not load as expected. What can I do other than installing the 64-bit version of Saia PCD?**

These issues are ultimately caused by 32-bit applications having access to less memory than their 64-bit counterpart. The best option would be to install the 64-bit version of SAIA PCD wherever possible. However, following these steps will help alleviate issues caused by a 32-bit installation.

1. Locate the '**nre.properties**' file in your SAIA PCD installation directory. It will be inside the **defaults** folder in the root of the installation directory. This will typically be **C:\SBC\SaiaPCDSupervisor\modules**
2. Locate the property identified by '**wb.java.options=**' and, if not already present' append **-Xms512M** to the end. It will look like this:

```
#####
#
# File: nre.properties
#
# This file contains properties which used
# the NRE launch executable
#
# Revision History
# 17 Feb 04 Brian Original
#
#####

# The list of options separated by spaces to pass thru to the VM
station.java.options=-Dfile.encoding=UTF-8 -Xms512K -Xmx6000M -Xms2000M -agentlib:jdwp=transport=dt_socket,server=y,suspend=n,address=6789
wb.java.options=-Dfile.encoding=UTF-8 -Xms512K -Xmx1024M -Xms512M
```

3. Locate the '**system.properties**' file. This will be in the same folder as the file from step 1. Add the following text to the end of this file: **saia PCD.jxbrowser.disable=false**
4. Restart the station and workbench.



These actions require editing Niagara properties files. We recommend backing up these property files before editing them so that they can be reverted if any errors occur.

**I am not seeing the same popups in Workbench as I am when viewing my station in a web browser. Why is this?**

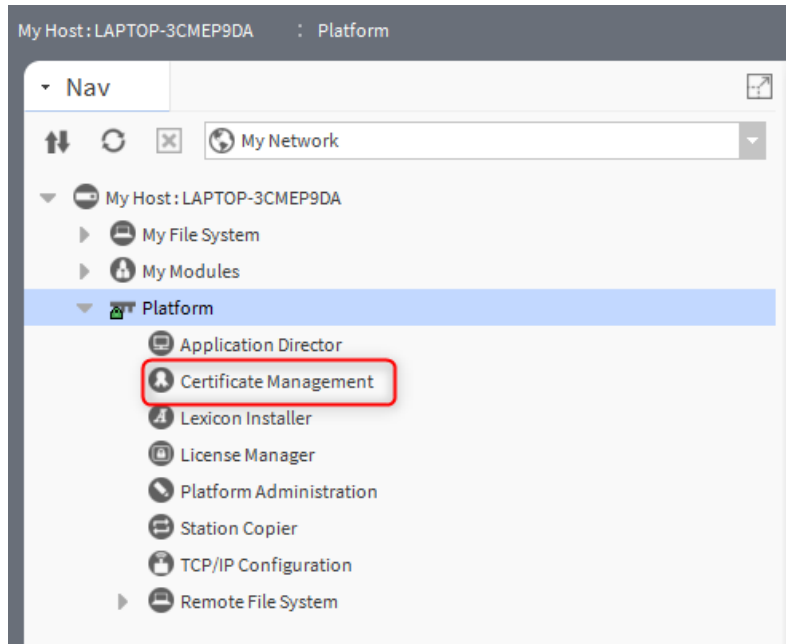
Some of the features will not work as fluently within SAIA PCD as they do in an actual browser. The SAIA PCD web browser is limited in its functionality. It is expected some of the UI elements behaviours are slightly degraded within the workbench for the above reason. Eg:- The popup menus are disabled within the workbench. Previewing in Google Chrome will allow the pop-up to work correctly.

**When connecting to my station running SAIA PCD SUPERVISOR EM via localhost, I am getting unexpected behaviour. Is there anything else I can try?**

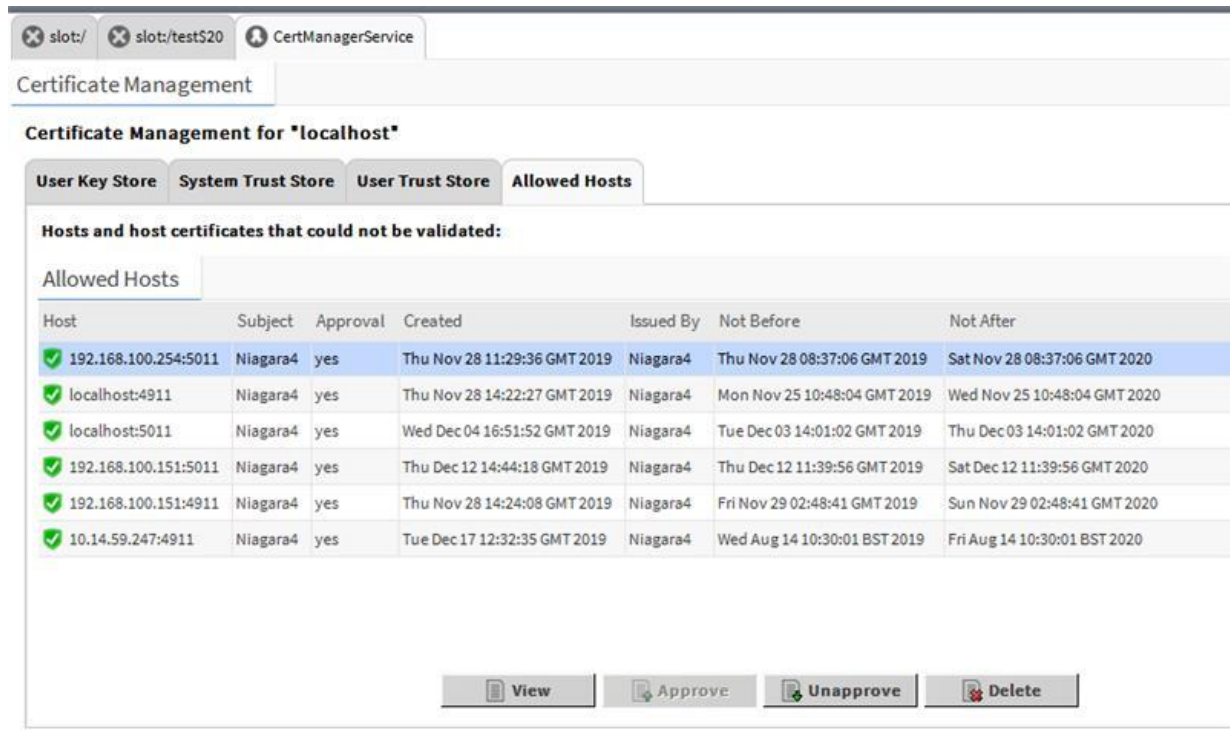
If your SAIA PCD SUPERVISOR EM widgets are not rendering as expected when accessing the station via localhost, try alternatively connecting via **127.0.0.1** or the actual IP Address of the station.

### Accepting TLC Certificate

Within workbench open the relevant platform and look for 'certificate management'



1. Navigate to the 'allowed hosts' tab
2. Search for 'localhost' and left mouse click to highlight it
3. Select the 'Approve' button
4. After you have completed this you should see the below.



## A Annex

### A.1 Icons



In manuals, this symbol refers the reader to further information in this manual or other manuals or technical information documents. As a rule there is no direct link to such documents.



This sign accompanies instructions that must always be followed.

### A.2 Contact

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Supportsite: ..... [www.sbc-support.com](http://www.sbc-support.com)

SBC site: ..... [www.saia-pcd.com](http://www.saia-pcd.com)

International Representatives &

SBC Sales Companies: ..... [www.saia-pcd.com/contact](http://www.saia-pcd.com/contact)

#### **Postal address for returns from customers of the Swiss Sales office**

#### **Saia-Burgess Controls AG**

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