SATEC
Powerful Solutions

expertpower™

ExpertPower 5.x

User Manual

BG0602 REV.A1

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Overview

This manual is intended to help new users become familiar with the main functions and pages of the ExpertPower Energy management web application.

Note that installation and setup topics are covered by other dedicated materials.

Manager Menu

Main/My View

The main view is a configurable personalized switchboard allowing to present information in various ways.

Layouts

The main view has two optional layouts – the Box view and the Map view. The Box view allows you to concurrently present data from multiple devices, and the Map view show a map of your metering devices. You can switch between the two via the Choose layout menu on the upper right corner.

Box view

The main screen allows viewing four smaller independent screens. Data is shown in either a table grid, or as a line diagram or a bar chart. The screens are defined for every user according to his or her permissions.

Click the pencil icon to edit the specific box device selection and change the view settings.

1. Select the view contents according to the current user permissions

2 Select the devices of choice from the device selection tree

3 Select the type of information to show

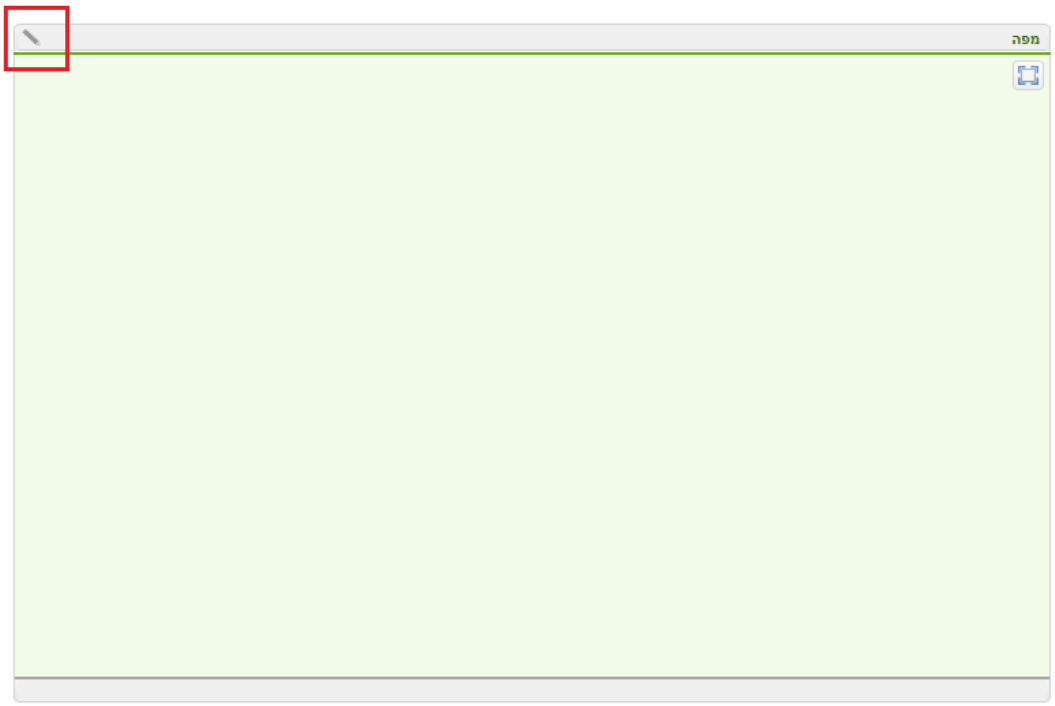
4 Click Add to complete

5 Click Cancel to cancel out

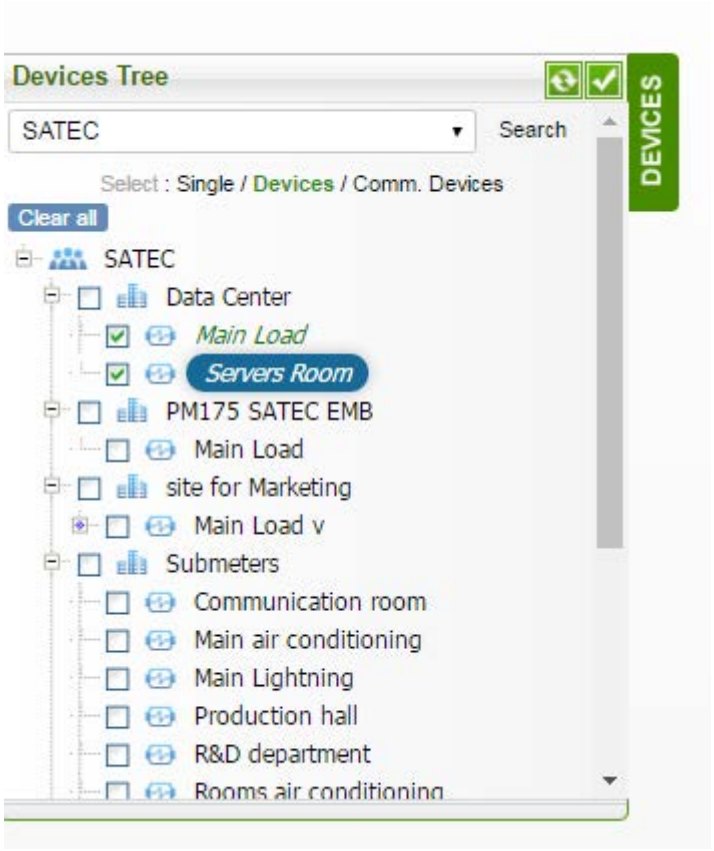
Click the View button at the bottom of every box to zoom in on that box by going to the dedicated specific page related to it. For example – clicking on View below the Last reading box will open a tab with the Last reading page for the device defined for the box.

Map View

Map view allows to graphically navigate between the devices defined for the customer. The Map provides a tree like layout of multiple devices. Clicking on one group will show the sub group of devices under it. Clicking on one device will move to a page presenting that specific device. The Edit button on the upper right corner allows to switch between several maps for the user.



Device Selection Tree:



Single

Allow to select a single Customer/Device/Comm Device from the tree.

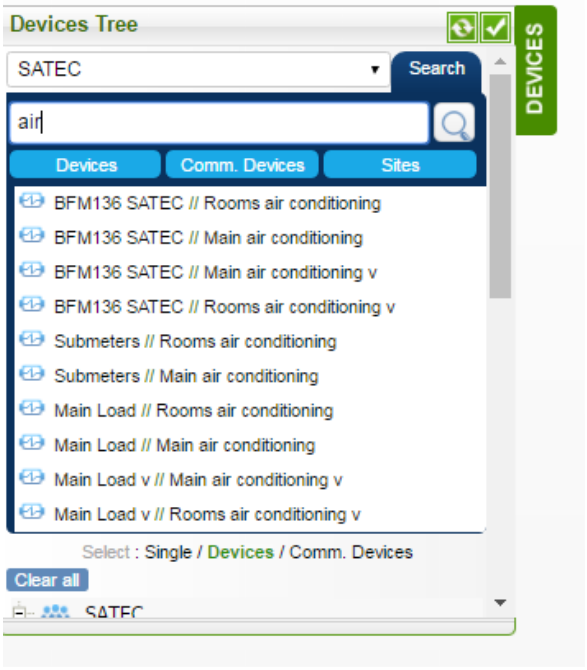
Devices

Allow to select one or more device from the tree.

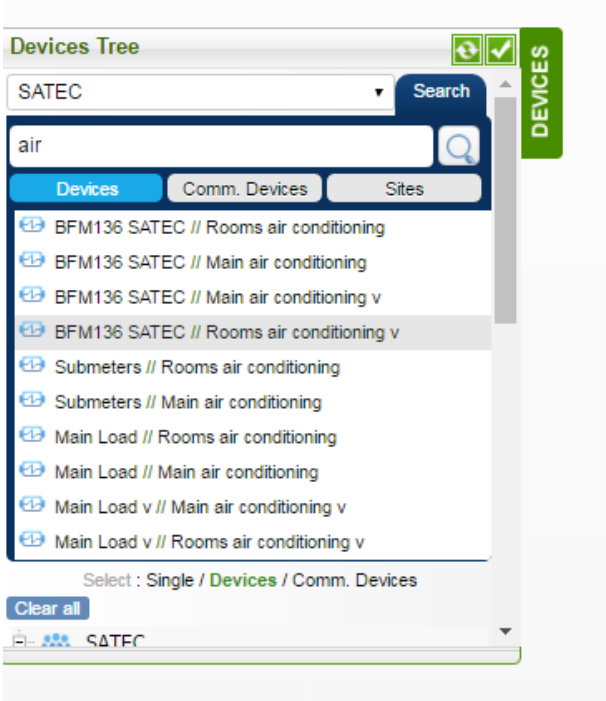
Comm. devices

Allow to select one or more communication device.

Search the Tree

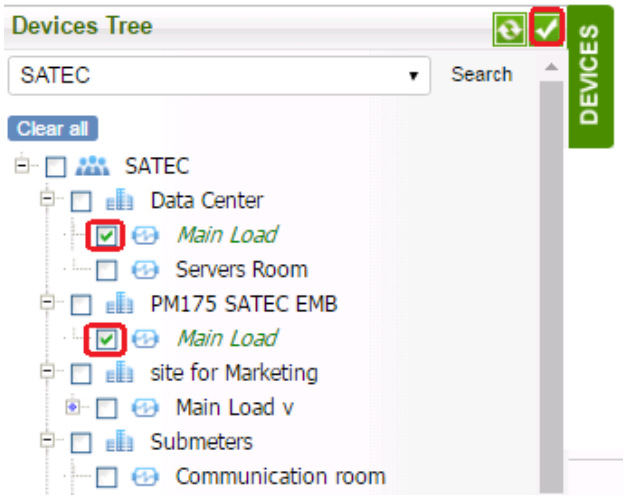


The Search option appears on the top of the Device selection tree. It applies to one or more of the three categories: Devices, Comm. Devices and Sites. Only selected categories (appearing in blue) will be included in the search. In order to exclude a category from the search, click it and it will turn white. For example, the following image shows the search tree after clicking the Comm. Devices and Sites top buttons, to make them grey and exclude them from the search:



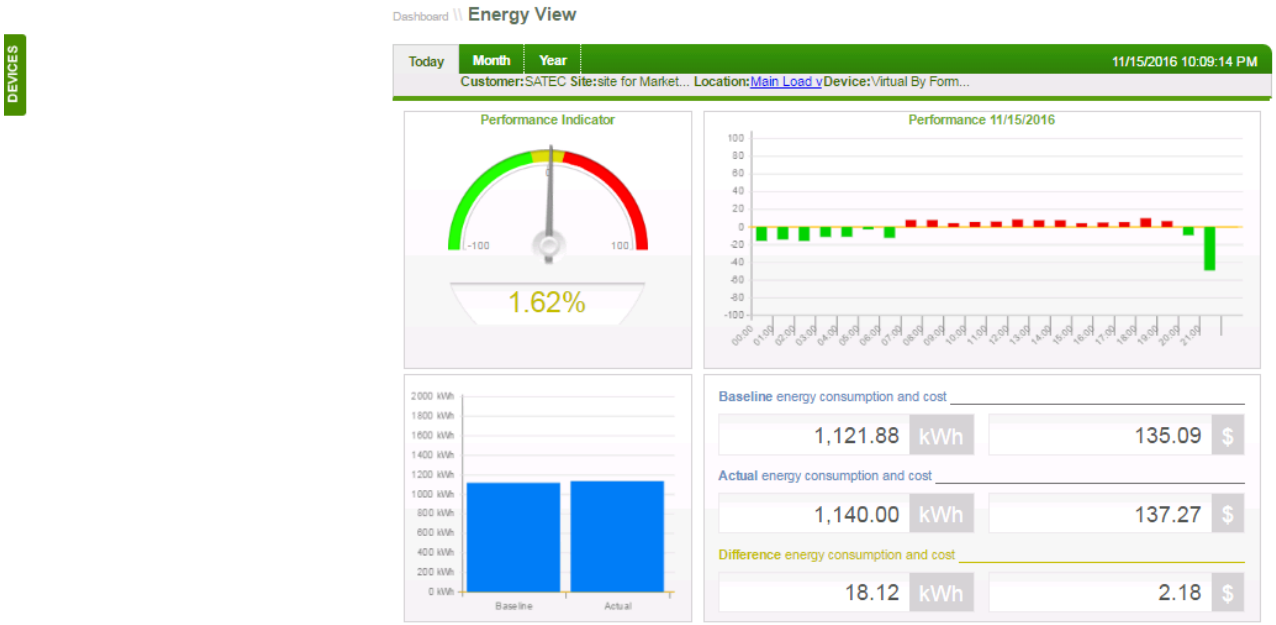
Device selection

Click the checkmark of one or more specific devices or sites of choice, and then for the selection to take place, click the green checkmark on the top right:



Energy View

This page provides a picture about a certain device in terms of performance, consumptions and cost



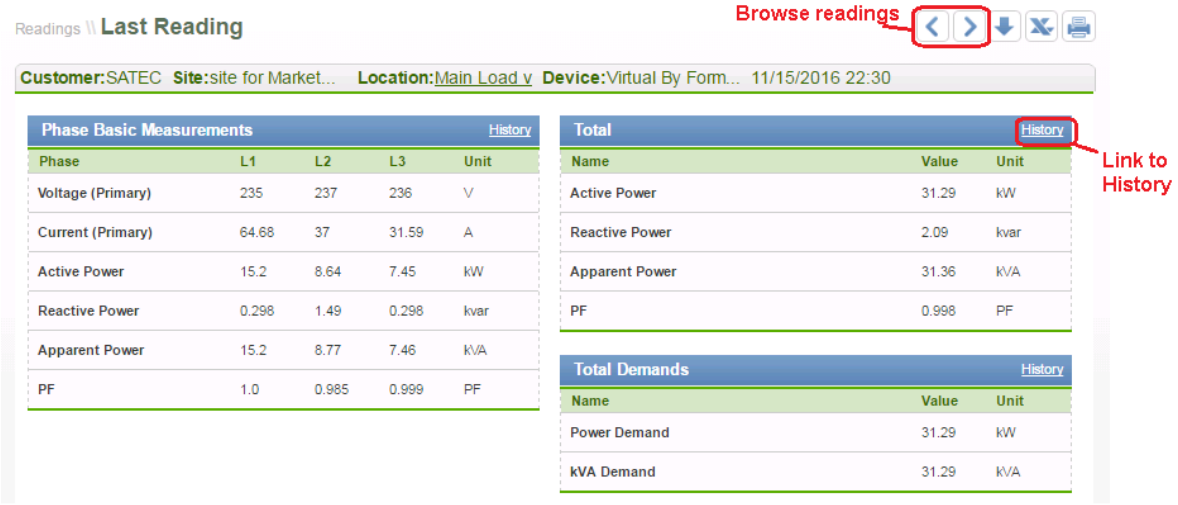
Readings

Readings pages are used to present various devices from the following aspects:

- Last reading
- History
- Max demands
- Data logs

Last reading

This screen shows the last reading from the device. You can browse between the different readings using the arrow button. At the upper part of every data group you can find a link to the history page. Clicking the parameter will also open the History page at the related parameter location.



History

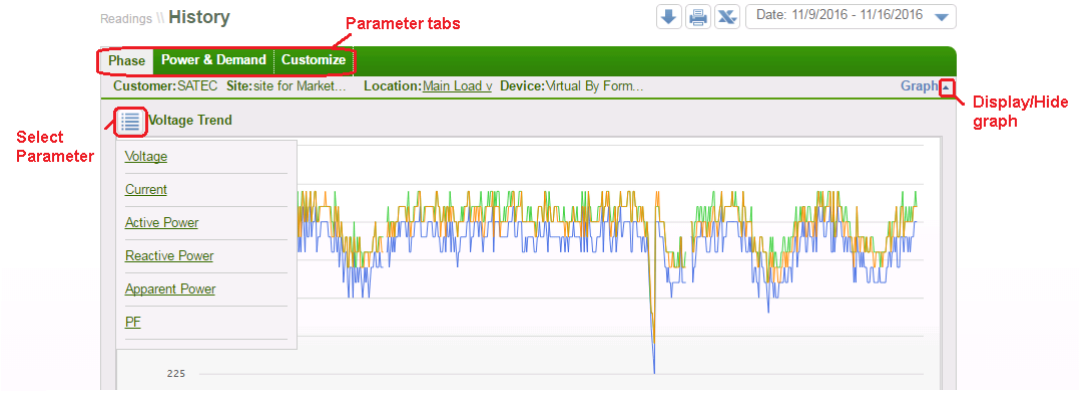
This screen shows the device historical readings. You can select Phase or Power & Demand tabs on the top, or the Customize tab in order to select specific fields: Check the specific fields and Submit to view their information.

Date selection

Dates can be selected by clicking the date selector from the upper right corner.

Graph

The top of the graph area has a show/hide button on the right, and a parameter selection on the left.



Data table

The table shows the selected reading fields. In order to see the details of a specific reading, click on its record time:

Record Time	Voltage LN, V			Current, A			Active Power, kW			
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1
11/16/2016 15:30:22	233.2	234.9	234.5	7.72	14.52	21.64	1.39	3.22	4.94	1.2
11/16/2016 15:01:52	233.3	234.7	234.1	7.72	14.56	21.56	1.39	3.22	4.94	1.2
11/16/2016 14:30:20	233.6	235.2	235	0	6.32	13.84	0	1.49	3.22	0
11/16/2016 14:02:04	233.7	234.8	234.5	0	6.28	13.88	0	1.49	3.22	0
11/16/2016 13:30:27	232.5	234.1	233.8	12.84	19.56	27.4	2.45	4.18	6.19	1.78
11/16/2016 13:01:49	232	233.8	233.1	0	6.28	13.88	0	1.49	3.22	0
11/16/2016 12:30:20	233.1	234.5	233.7	4.36	10.6	18.52	0.816	2.45	4.27	0.528
11/16/2016 12:01:58	233.3	234.8	234.5	8.72	15.36	13.64	1.68	3.41	2.93	1.2

As a result, the following details are shown for that reading:

Readings \\ **Last Reading**

Customer:SATEC **Site:**Submeters **Location:**Main air conditio... **Device:** BFM136-036 Logs 11/16/2016 15:30

Phase Basic Measurements History

Phase	L1	L2	L3	Unit
Voltage LN (Primary)	233.2	234.9	234.5	V
Current (Primary)	7.72	14.52	21.64	A
Active Power	1.39	3.22	4.94	kW
Reactive Power	1.2	1.2	1.1	kvar
Apparent Power	1.78	3.41	5.04	kVA
PF	0.762	0.937	0.974	PF

Total History

Name	Value	Unit
Active Power	9.46	kW
Reactive Power	3.5	kvar
Apparent Power	10.13	kVA
PF	0.939	PF
Frequency	49.97	Hz
Neutral Current (Primary)	13.52	A

Energy History

Name	Value	Unit
Active Energy	49,345	kWh
Active Export Energy	0	kWh
Apparent Energy	61,732	kVAh

Demands History

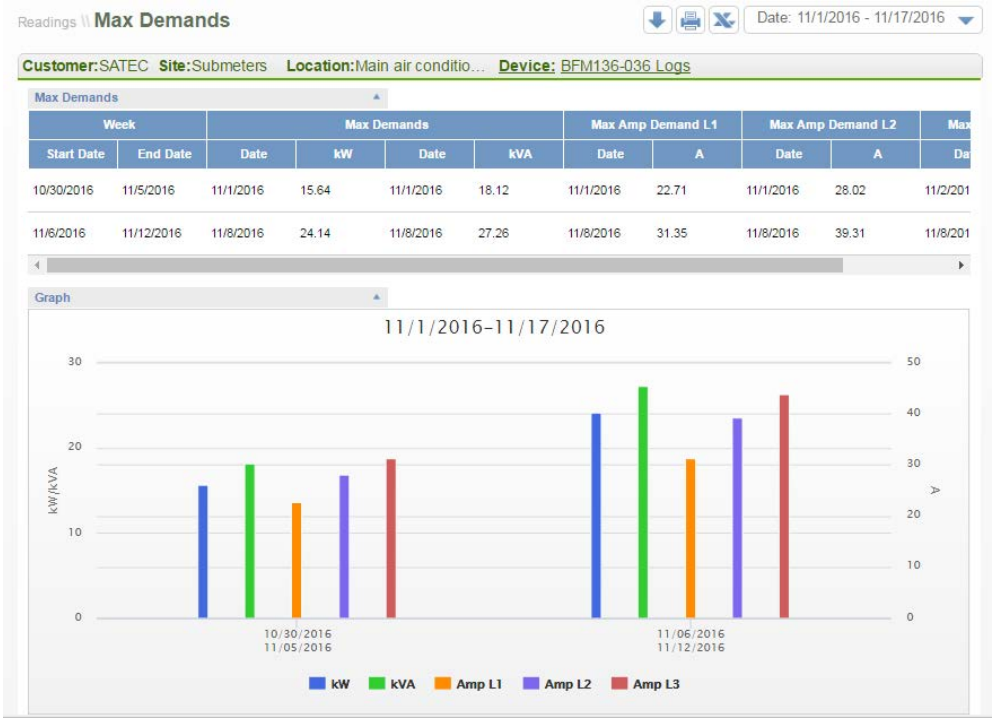
Phase	L1	L2	L3	Unit
Max Amp. Demand (Primary)	31.36	39.32	43.8	A

Total Demands History

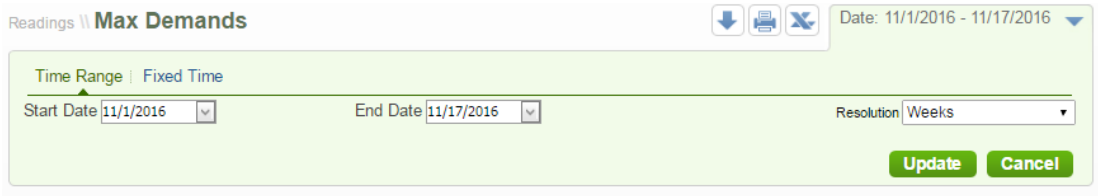
Name	Value	Unit
Max. Power Demand	24.15	kW
Acc. Power Demand	0.24	kW
Max. kVA Demand	24.15	kVA
Power Demand	7.82	kW
kVA Demand	8.11	kVA
Accum. kVA Demand	0.24	kVA

Max Demands

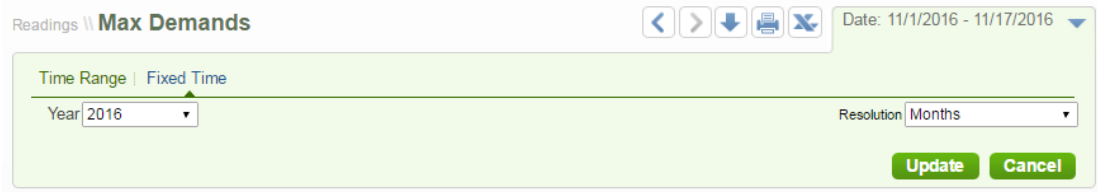
In this page you can see the Max Demand data, in a table and a graph across a Day/Month/Year according to the selected resolution, during the selected date range.



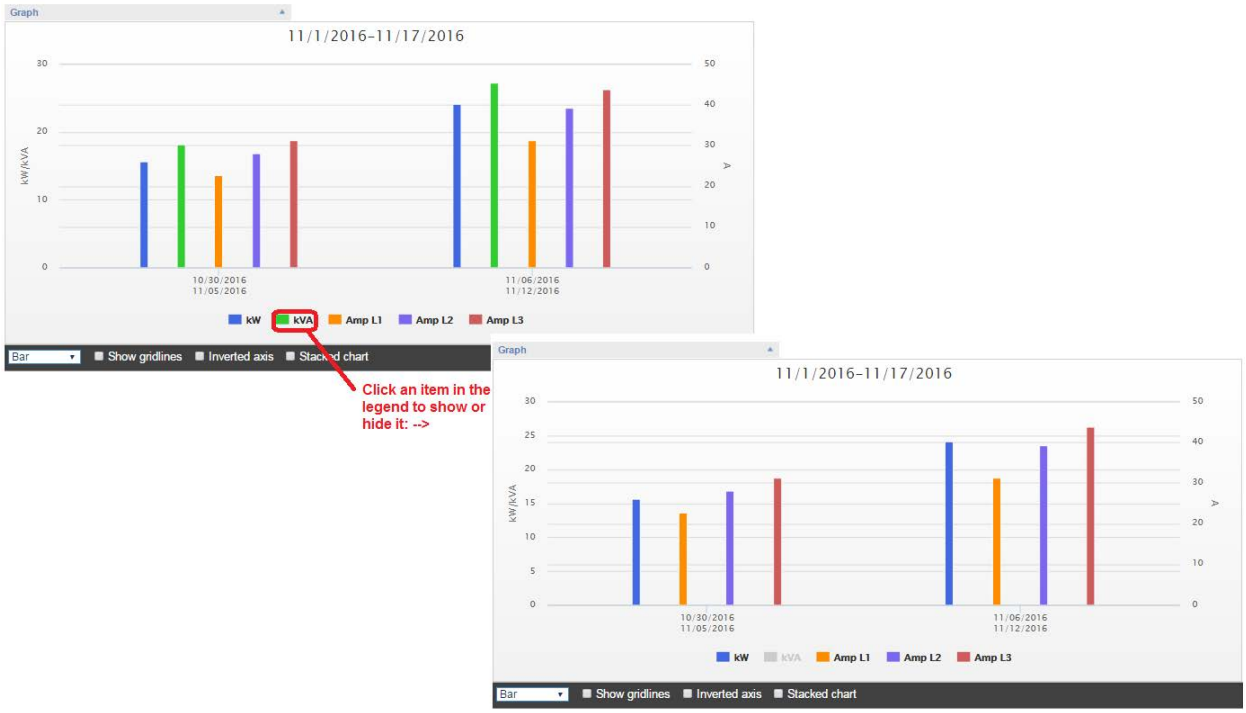
Clicking on the upper right data range selector, opens a menu for selecting a specific date range:



If you select the Fixed Time option, you can select a specific year of choice from a dropdown:

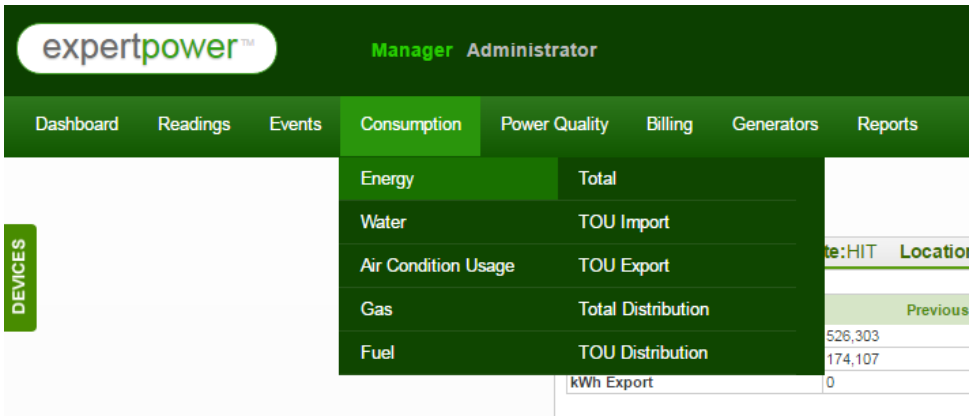


The graph legend allows to hide or show specific parameters:



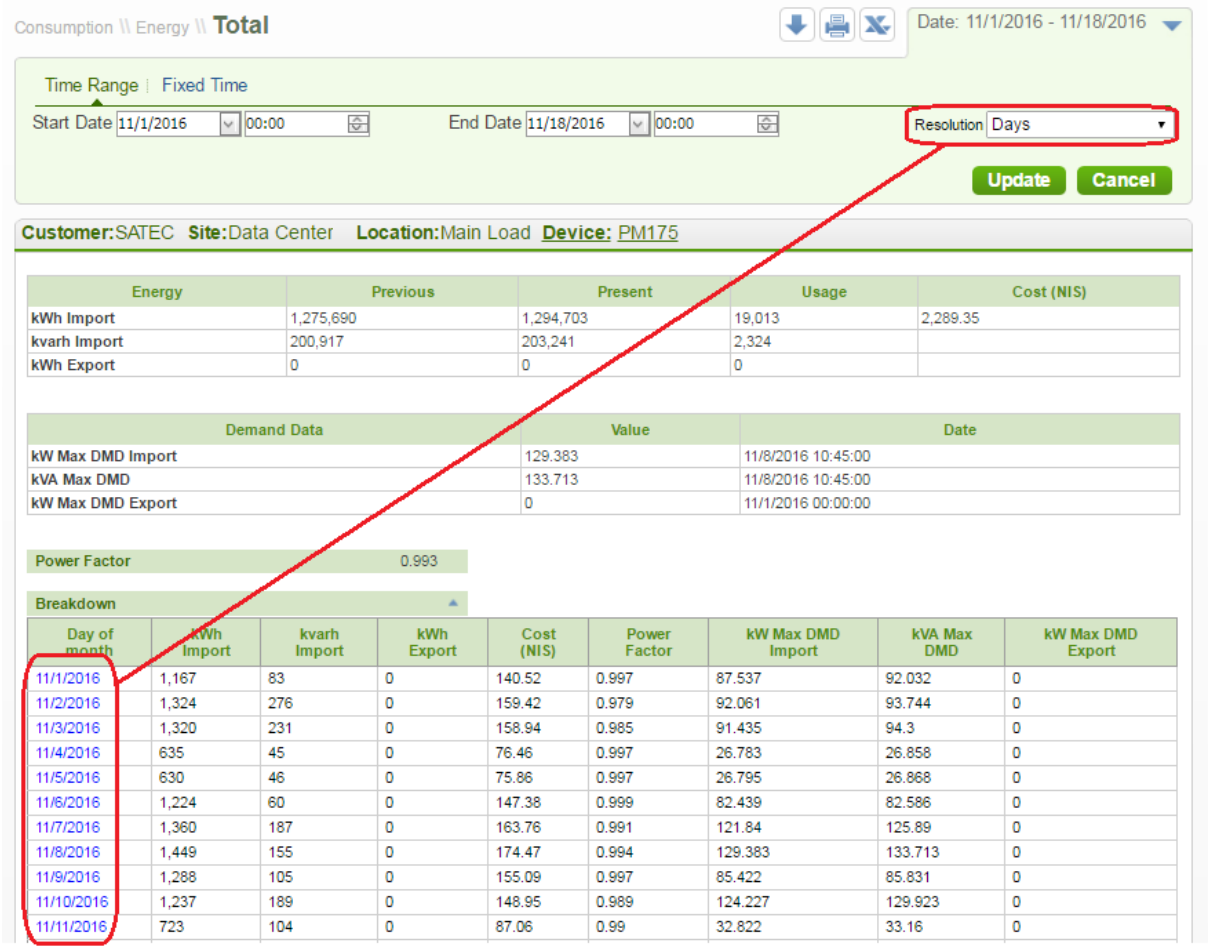
Consumption

Consumption pages offer various views around energy consumption measured by the metering devices. When selecting the Consumption tab, first select the usage type of choice: Electric energy, Gas, Water etc. and then select the duration and resolution for which you want to see the data:



Energy / Total

In this page you can display total consumption on a daily or monthly basis for one or multiple devices. Information is displayed in both a data table and a graph. The top of the page shows the total consumption in the selected period and the table below shows specific numbers according to the selected duration and resolution.



Energy	Previous	Present	Usage	Cost (NIS)
kWh Import	1,275,690	1,294,703	19,013	2,289.35
kvarh Import	200,917	203,241	2,324	
kWh Export	0	0	0	

Demand Data	Value	Date
kW Max DMD Import	129.383	11/8/2016 10:45:00
kVA Max DMD	133.713	11/8/2016 10:45:00
kW Max DMD Export	0	11/1/2016 00:00:00

Power Factor 0.993

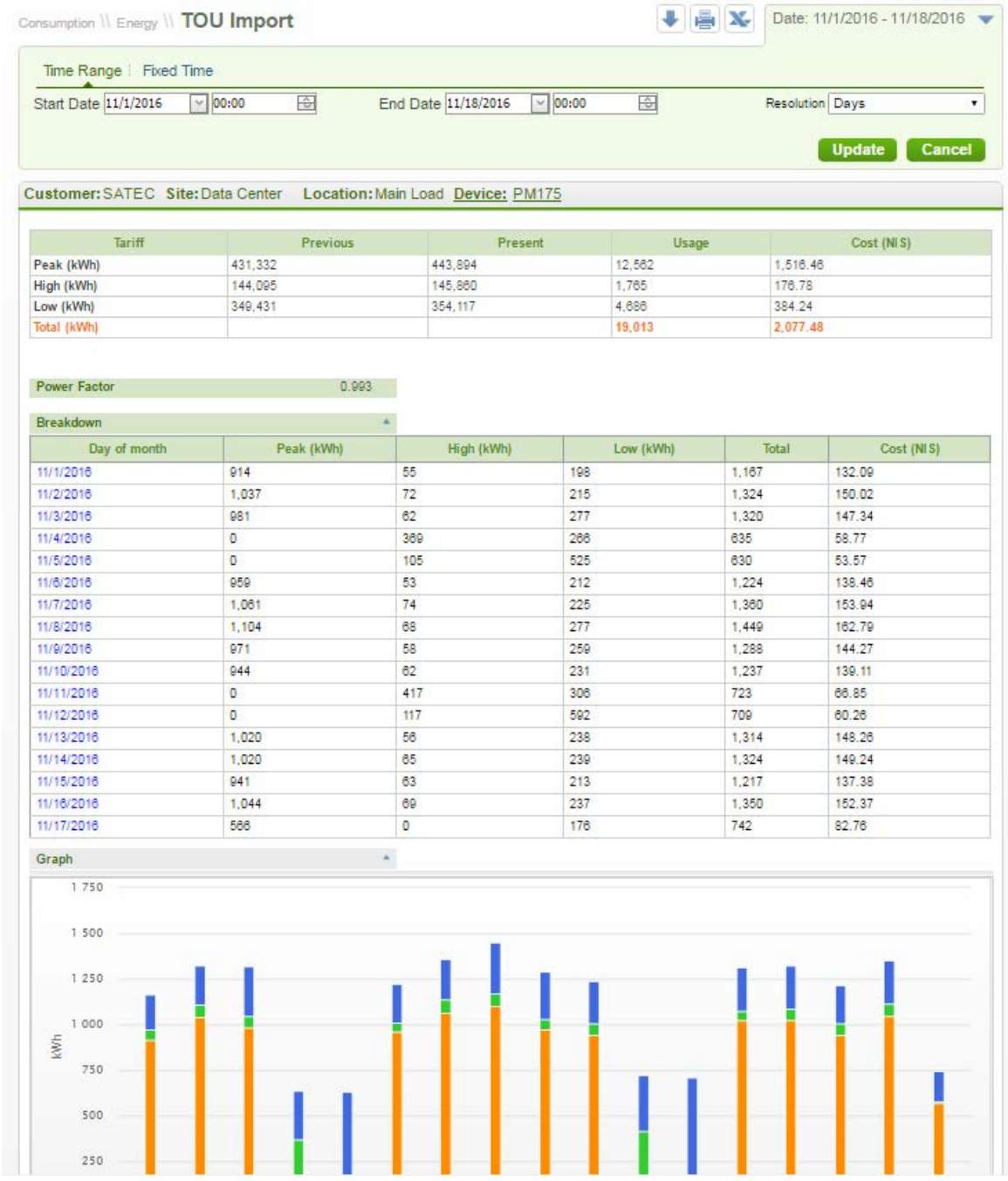
Breakdown

Day of month	kWh Import	kvarh Import	kWh Export	Cost (NIS)	Power Factor	kW Max DMD Import	kVA Max DMD	kW Max DMD Export
11/1/2016	1,167	83	0	140.52	0.997	87.537	92.032	0
11/2/2016	1,324	276	0	159.42	0.979	92.061	93.744	0
11/3/2016	1,320	231	0	158.94	0.985	91.435	94.3	0
11/4/2016	635	45	0	76.46	0.997	26.783	26.858	0
11/5/2016	630	46	0	75.86	0.997	26.795	26.868	0
11/6/2016	1,224	60	0	147.38	0.999	82.439	82.586	0
11/7/2016	1,360	187	0	163.76	0.991	121.84	125.89	0
11/8/2016	1,449	155	0	174.47	0.994	129.383	133.713	0
11/9/2016	1,288	105	0	155.09	0.997	85.422	85.831	0
11/10/2016	1,237	189	0	148.95	0.989	124.227	129.923	0
11/11/2016	723	104	0	87.06	0.99	32.822	33.16	0

Energy TOU Import/Export

These pages show consumption according to Time Of Use Peak, High and Low tariff durations throughout the day, in a monthly or daily resolution, shown as a data grid as well as a graph.

The top of the page shows the total per TOU tariff duration:



Tariff	Previous	Present	Usage	Cost (NIS)
Peak (kWh)	431,332	443,894	12,562	1,516.46
High (kWh)	144,095	145,860	1,765	176.78
Low (kWh)	349,431	354,117	4,686	384.24
Total (kWh)			19,013	2,077.48

Day of month	Peak (kWh)	High (kWh)	Low (kWh)	Total	Cost (NIS)
11/1/2016	914	55	198	1,167	132.09
11/2/2016	1,037	72	215	1,324	150.02
11/3/2016	981	62	277	1,320	147.34
11/4/2016	0	369	266	635	58.77
11/5/2016	0	105	525	630	53.57
11/6/2016	959	53	212	1,224	138.46
11/7/2016	1,061	74	225	1,360	153.94
11/8/2016	1,104	68	277	1,449	162.79
11/9/2016	971	58	259	1,288	144.27
11/10/2016	944	62	231	1,237	139.11
11/11/2016	0	417	306	723	66.85
11/12/2016	0	117	592	709	60.26
11/13/2016	1,020	56	238	1,314	148.26
11/14/2016	1,020	65	239	1,324	149.24
11/15/2016	941	63	213	1,217	137.38
11/16/2016	1,044	69	237	1,350	152.37
11/17/2016	566	0	176	742	82.76

Energy TOU/Total distribution

These pages graphically highlight the distribution between multiple devices:

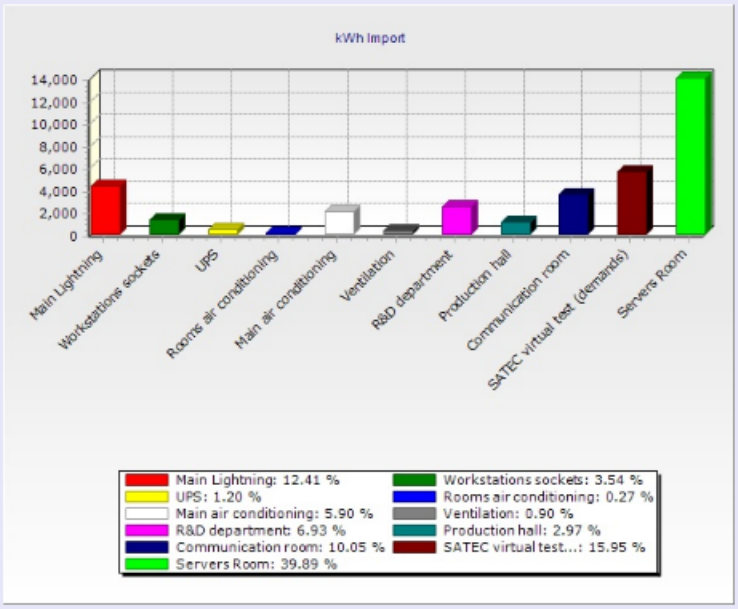
Consumption \\ Energy \\ **Total Distribution**

Date: 11/1/2016 - 11/18/2016

Data exists for 11 out of 11 devices
* Complete data not available for this device
** Summary Graph can not be shown because of incomplete comparison data
*** Complete data not available for this device and therefore summary graph is not shown

Customer: SATEC **Site:** Submeters

Device	kWh Export	kWh Import	kWh Total	PF	Max Demands, kW
		General			
Main Lightning	0	4,360	4,360	1.000	31
Workstations sockets	0	1,245	1,245	1.000	11
UPS	0	420	420	1.000	
Rooms air conditioning	0	96	96	1.000	5
Main air conditioning	0	2,073	2,073	0.907	24
Ventilation	0	315	315	0.988	
R&D department	0	2,434	2,434	1.000	14
Production hall	0	1,042	1,042	1.000	8
Communication room	0	3,532	3,532	1.000	10
SATEC virtual test (demands)	0	5,605	5,605	1.000	
Servers Room	0	14,016	14,016	1.000	
Total	**0**	**35,138**	**35,138**		



Event View

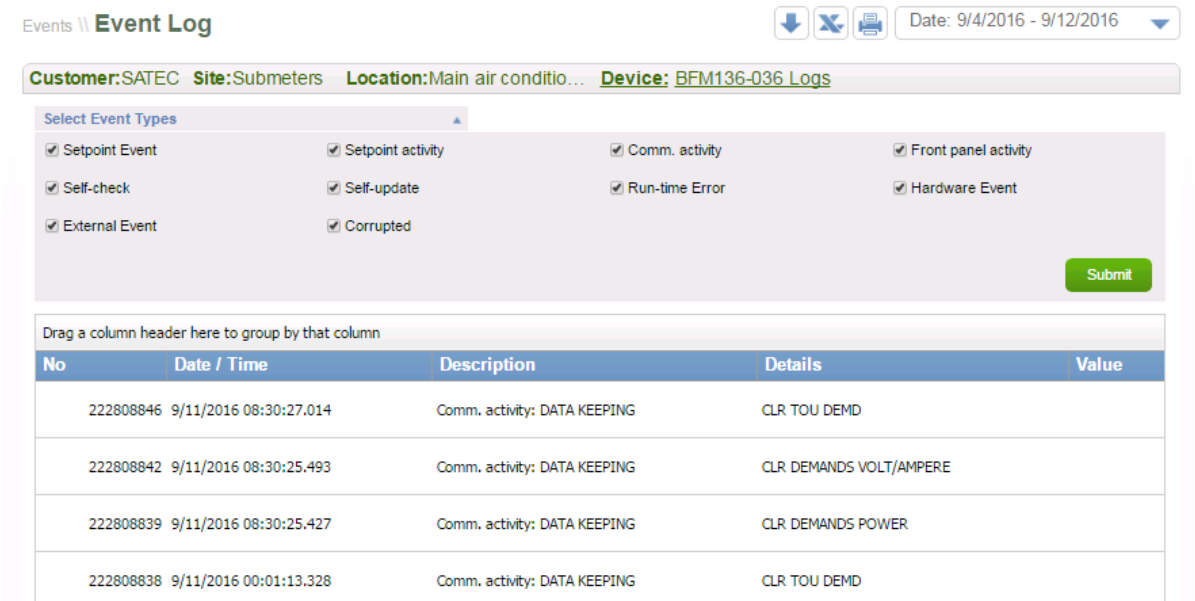
ExpertPower can detect various types of configurable events, such as disconnections, failures or exceptional consumption. Events can also trigger notifications via emails or SMS messages.

Events are shown on the Event View page for the selected date duration, under 3 categories: Info, Warning or Critical. Clicking on the blue/orange/red category buttons on the top right, will filter the shown events accordingly.

Note: in order to see events the user needs to first define their triggering conditions in the administrator menu for any site or device.

Event Log

This page shows the event log for the selected meter or communication device. The events are shown on a table. The table header provides a list of event types for selection and display on the table, once you check and click Submit.



Event Summary

This page shows specific important daily events from all customer devices which should be taken care of and resolved. Click the arrow button on the right of the event type to see specific events and their device and time information.

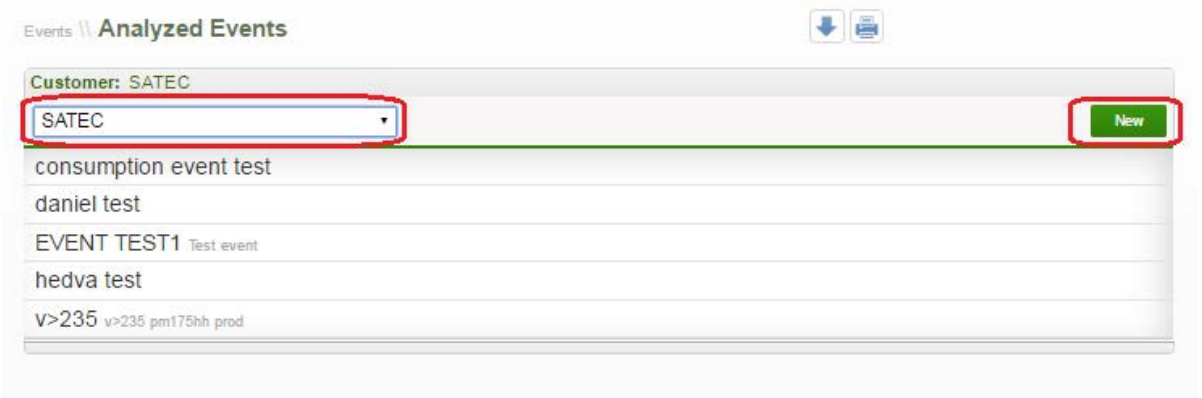
Notifications

This page shows all notifications which were sent to the customer via email or SMS.

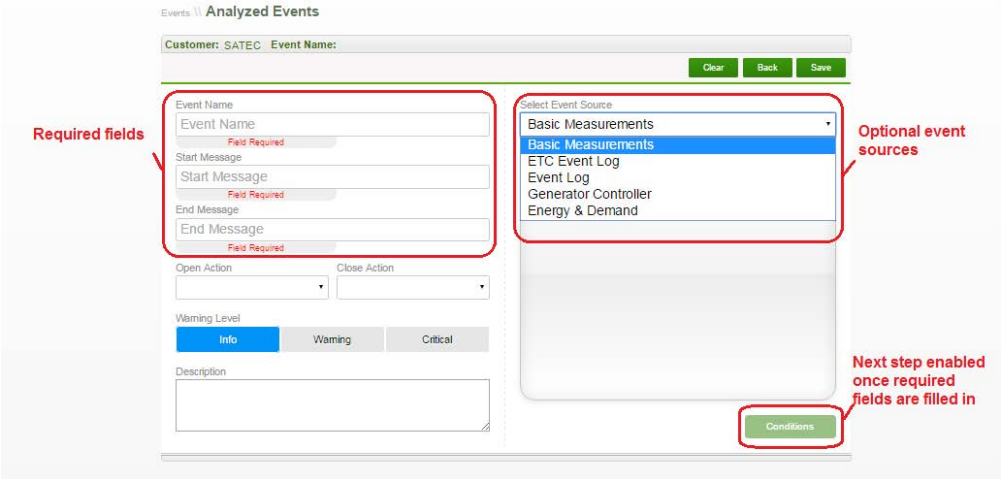
Analyzed Events

Adminsitrator > Events > Analyzed Events

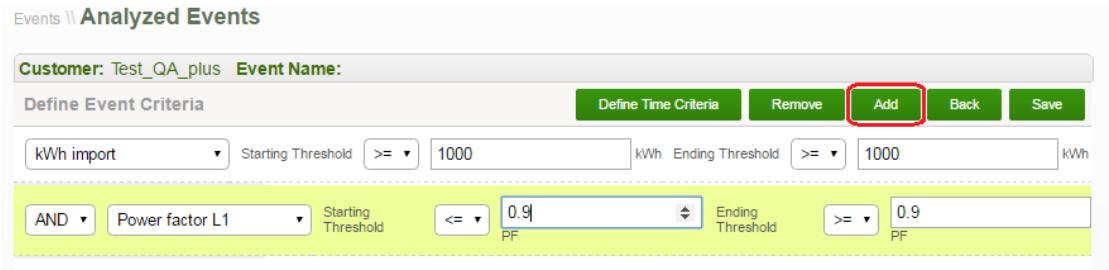
1. First select a customer and hit "New":



2. Fill in the mandatory fields – Event name, Start message to show or send upon opening the event, End message, Source and specific device from the selection tree on the right, and click "Conditions":



3. Click Add to create an event triggering condition. You can add multiple conditions with AND or OR relation between them:



By selecting Define Time Criteria you can also set time specific conditions, such as for the event to be only considered during daytime hours, or only during a weekend such as the following:

Always remember to click Save in order to complete the analyzed event definition and save your work.

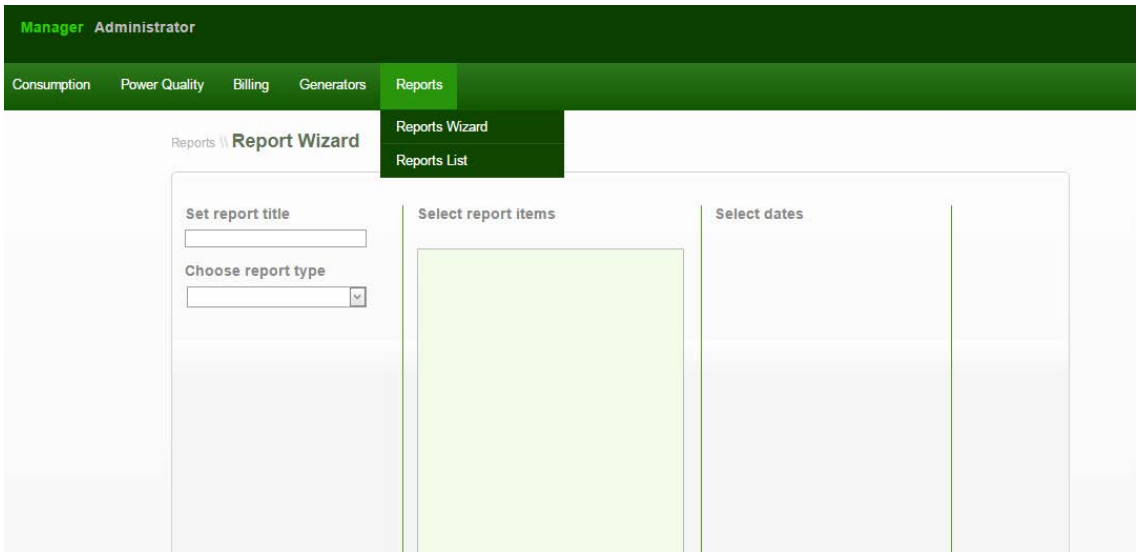
Notification settings

Administrator > Events > Notifications

This page allows administrators to define sending email or SMS notifications upon triggering of various events.

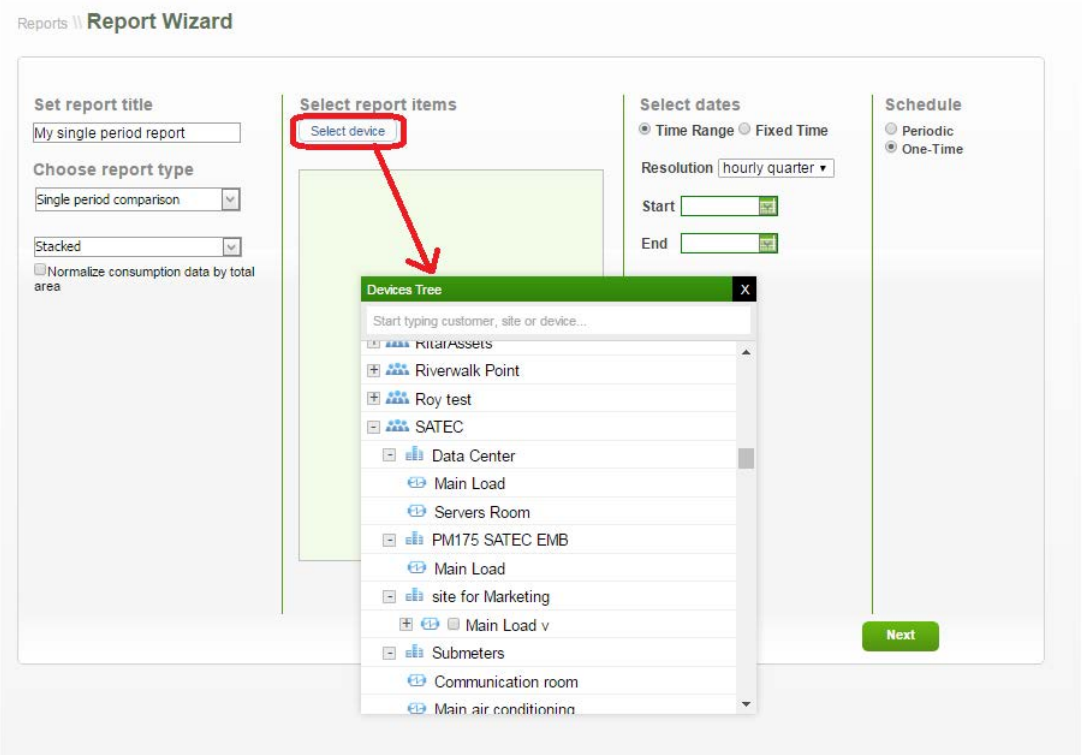
Reports

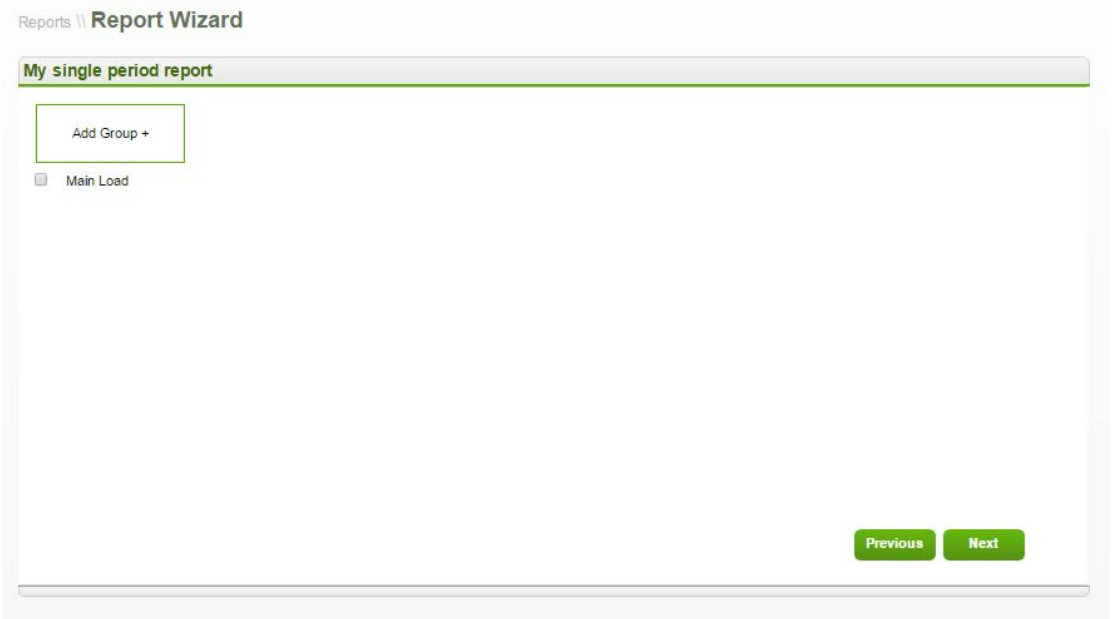
Reports are first defined by going through the Report Wizard, then they can be saved, and regenerated, exported or edited from the Report list:



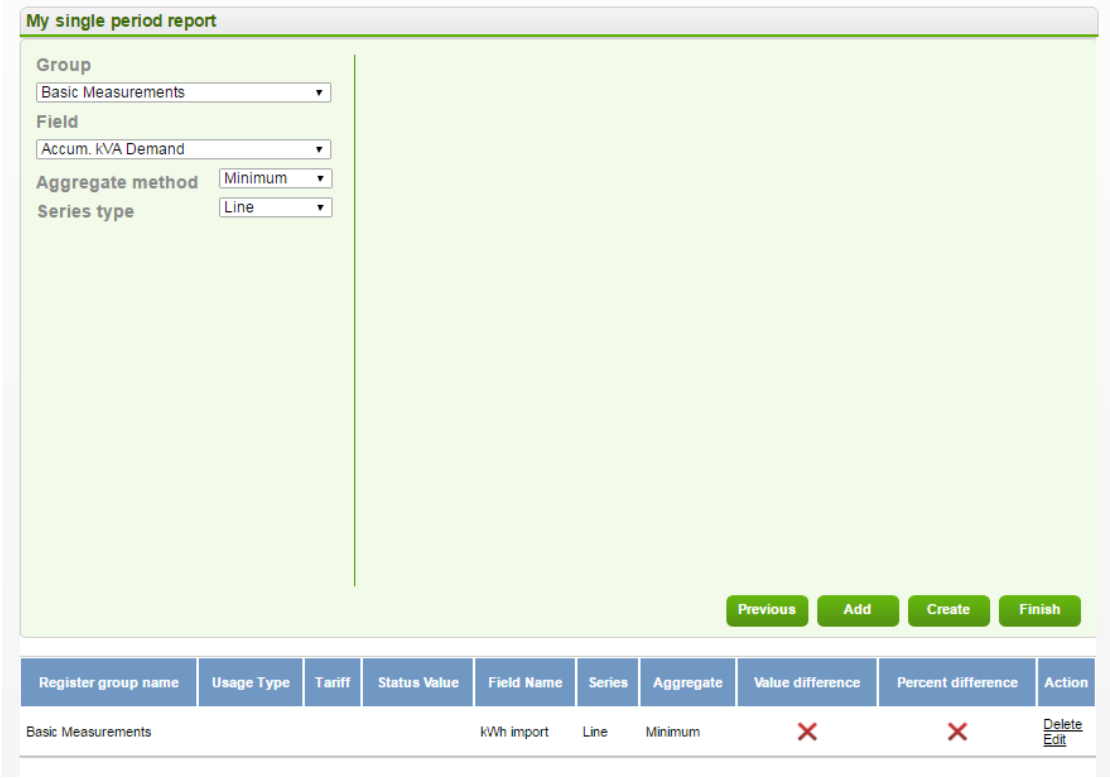
When going to the Report Wizard, give your new a report a name and select its type from the drop down. Now appropriate fields required for that report, will be shown such as source, graph type, start/end time etc.

In most cases you need to also select the device/s for the report, and the duration. Once you are done filling in all required fields, for some reports you may have to go through additional wizard cards, such as in the example below to allow grouping several devices into one or more groups:



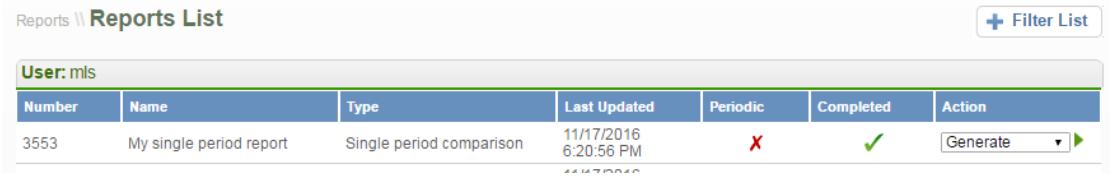


Click Next to select data source fields. Click "Add" for every field you want to add:

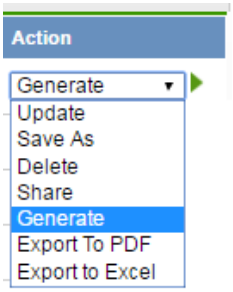


Once you are done, click Finish to save the report, or Create to generate and save it.

Saved reports are then appearing on the Report List to allow they further reuse:



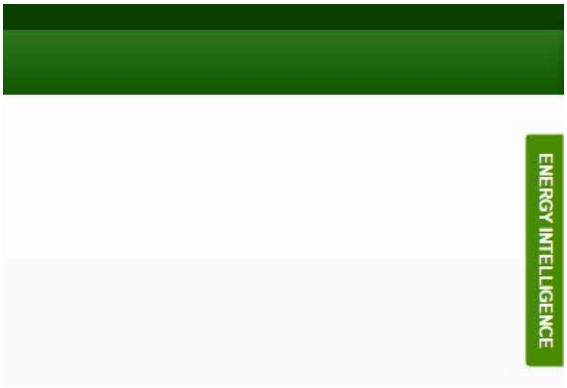
Click the Action selection for the following options and click the green triangle for the action to take place:



Energy Intelligence

The Energy Intelligence module provides strong and simple data analysis tools, such as configurable dashboards, allowing to quickly gain consumption insights from your site or any group of meters of choice.

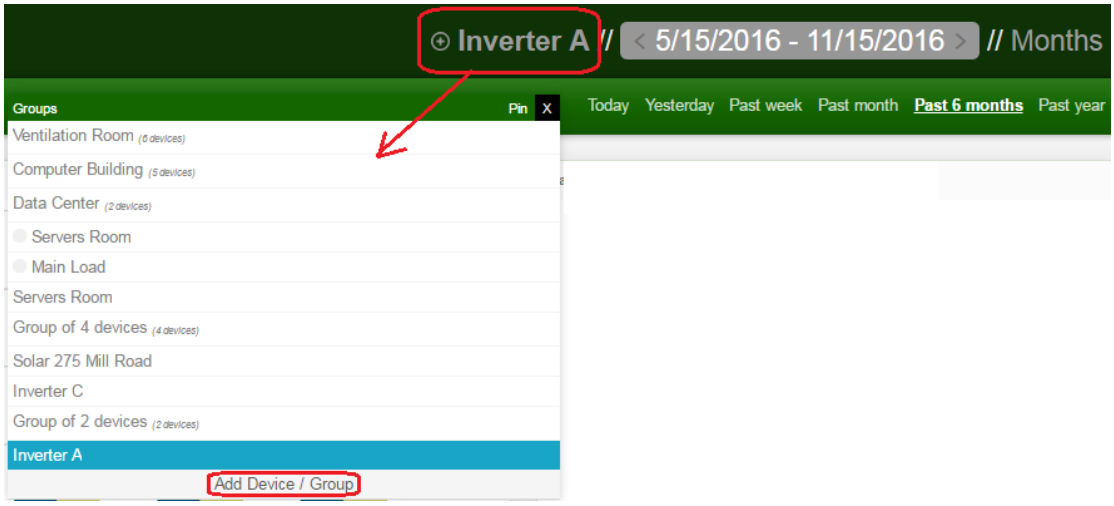
Open the Energy Intelligence module by clicking the vertical Energy Intelligence on the right hand side of the screen:



Following is a description of the various module components:

Object selector

All Energy Intelligence charts are always reflecting the selected device / group, dates and resolution that appears on the top toolbar. Click the device name on the top toolbar, for the object selector to open up, showing existing group definitions added by the current user, also allowing to Add Device or Group

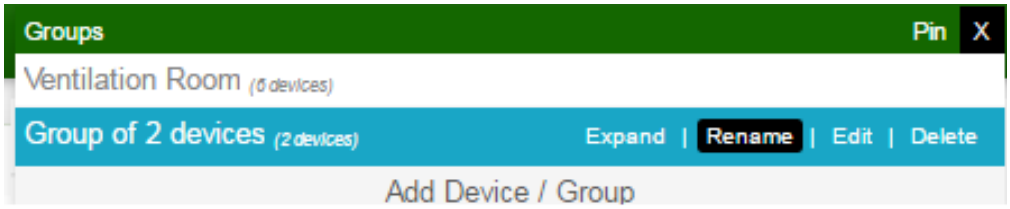


Upon clicking the Add Device/Group, the Device selection tree opens up.

The device selection tree will also open directly if you click the round plus icon to the left of the current device on the top toolbar.

You can use the tree's top search option or just scroll and click on any device or site once to select it, or click it again to exclude it from the current selection which appears below the selection tree. Click the green bottom "Select" button for your selection to appear on the group list and close the tree.

Once selecting more than one device, a default group name will appear on the list, which you can rename according to your requirements (e.g. 'Building A' for a group of all that building meters):

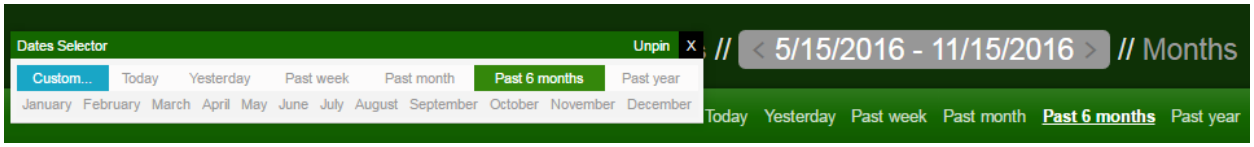


These device selection groups will remain defined under your user account unless if you decide to use the Delete option on the right hand side (see below) to delete it.

Date selector

You make changes to the duration/resolution selection in one of 3 ways:

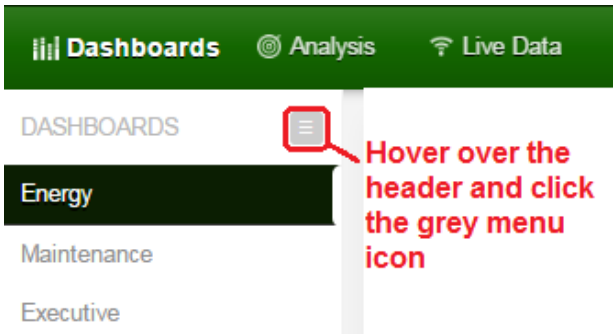
- Click the current date duration appearing on the top toolbar
- Click the current resolution
- Click any fixed duration from the list: Today, Yesterday, Past week, Past month, Past 6 months or Past year.



The date selector also provides a 'Custom…' option to select specific days / hours for the start and end times.

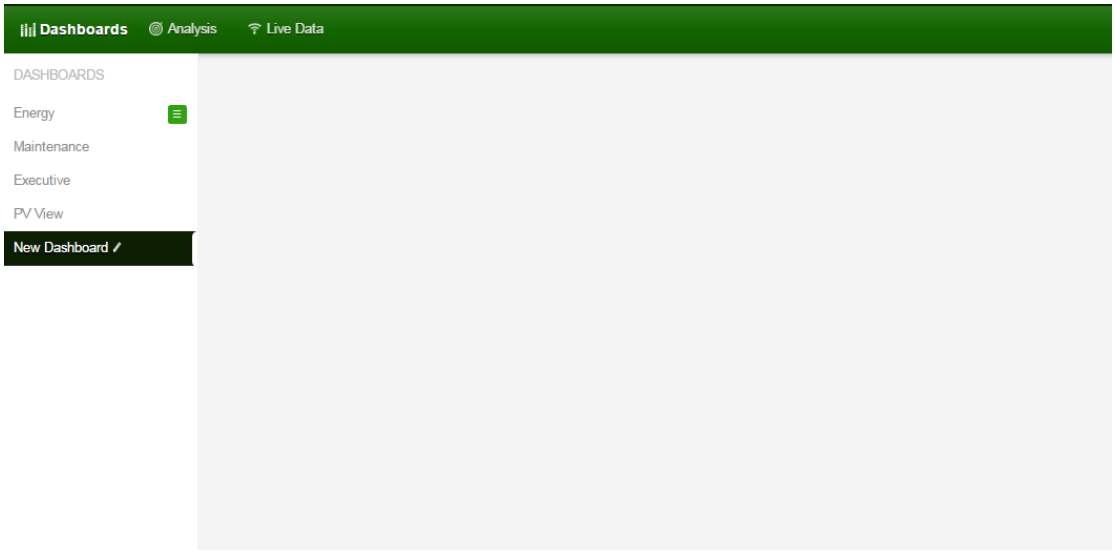
User defined Dashboards

You can make you own dashboards mixing any of the dozens of available widgets, to best suit your needs:

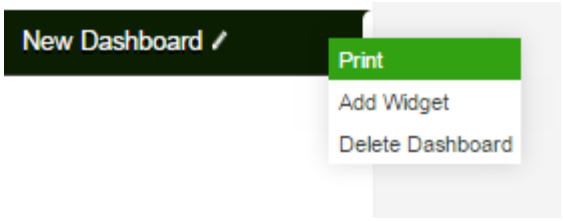


Once you click the above grey menu icon, select the Add Dashboard option that will pop up.

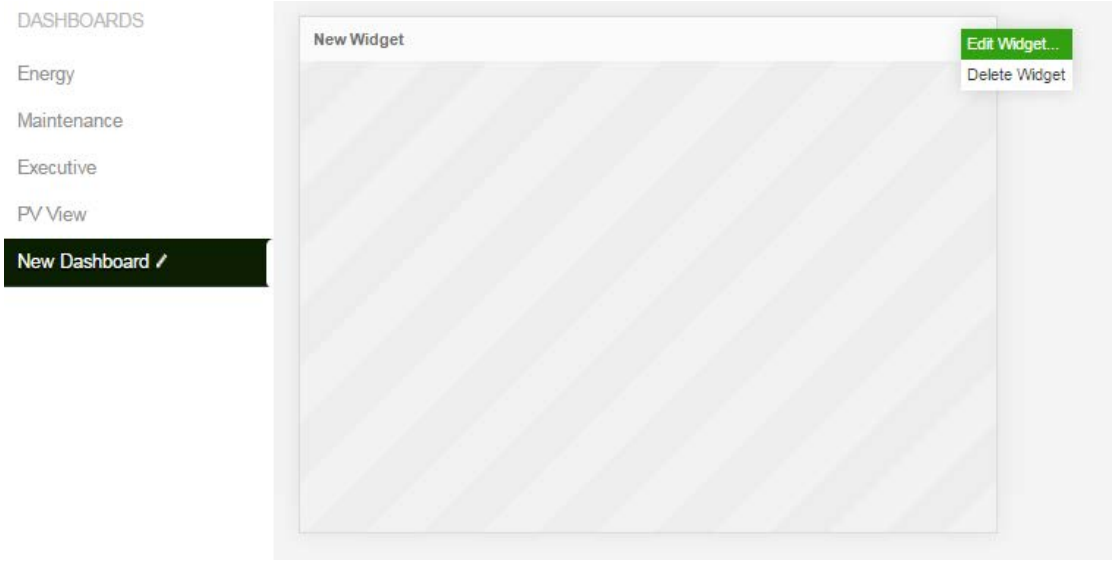
At this point a blank "New Dashbord" will become available on the left. Click to select it:



Click the green menu icon on that dashboard in order to Add a Widget:



Once you click the Add Widget, an empty area is created for the widget on the blank canvas. Click Edit Widget, to select the type of widgets from the dropdown.



Once you selected a widget and it is displayed, you can hover over its boundaries to see a double sided icon that can be dragged in order to stretch or move the widget around the canvas.

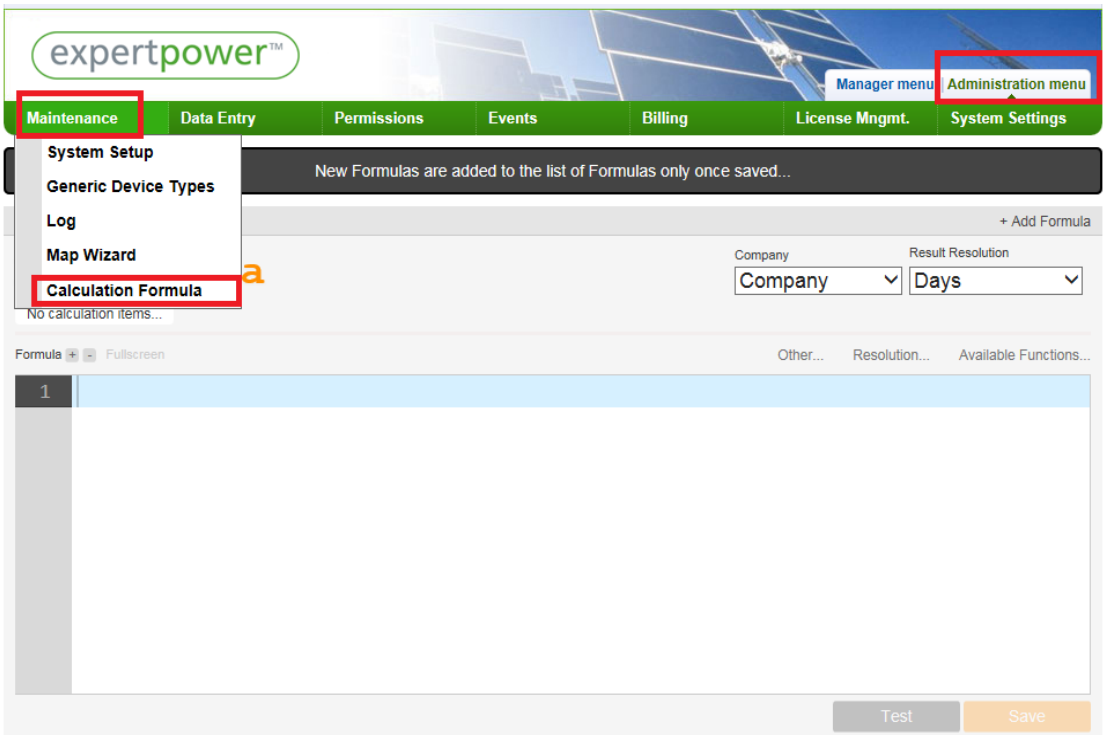
Repeat the steps above to addmore widgets to your dashboard. From the menu icon on the dashboard name you can Print it over to PDF or rename it as needed.

Calculation formula

Administration Menu > Maintenance> Calculation Formula

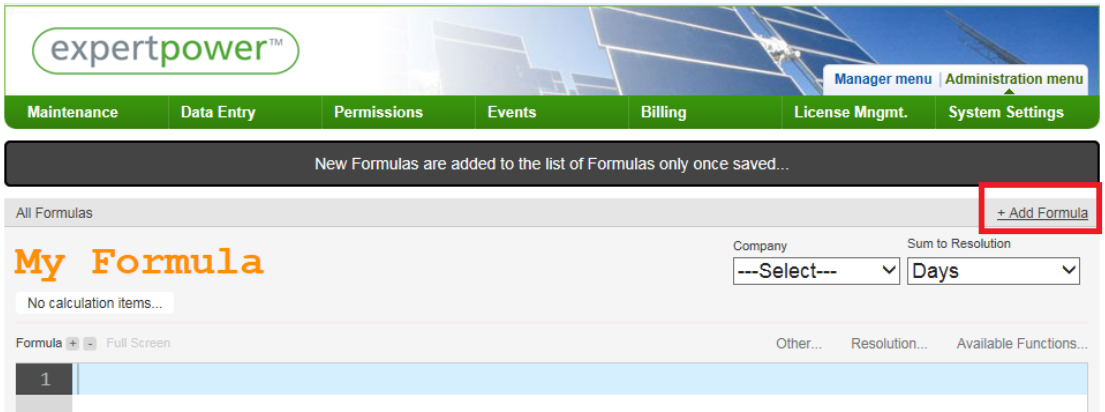
ExpertPower 5.0 presents a new module - a calculation formula engine. The motivation is to consolidate all the required formula definitions in a single location. A formula represents a set of one or more conditions. The conditions are written in a script like supported language, as explained below. The formula can be used as a billing calculation or as consumption event criteria.

Accessing the formula engine



Creating a new formula:

To create a new formula you must click on "Add formula"

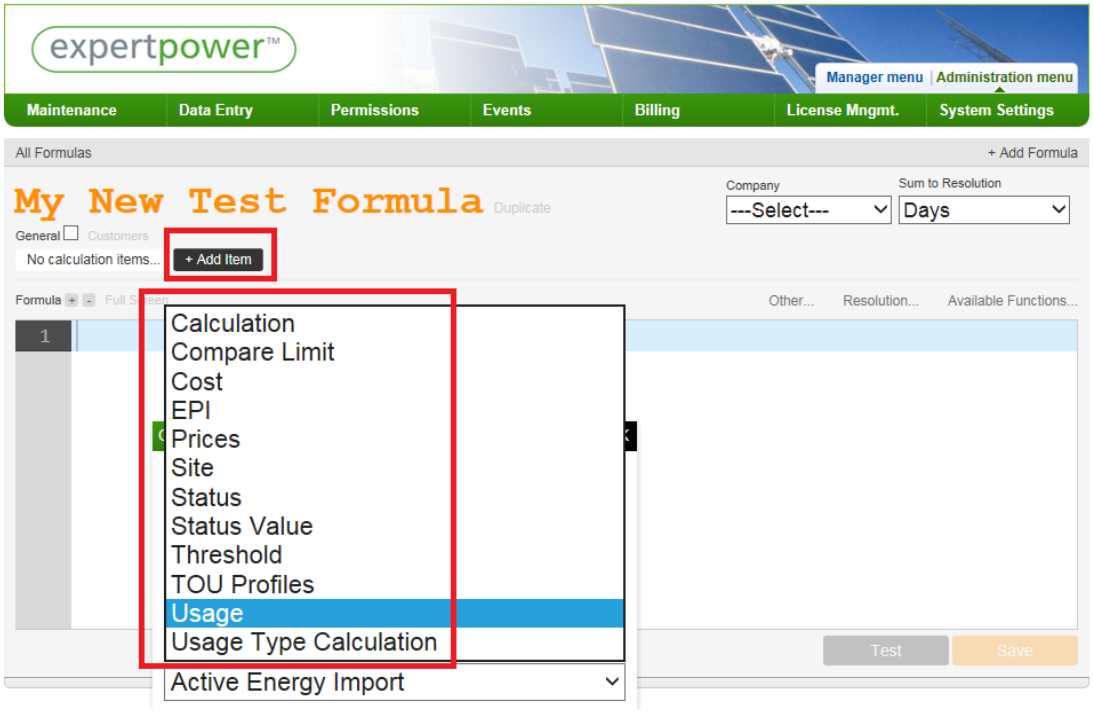


1. Enter a formula name and click on Save

In the first stage, please enter a unique name for the formula and click "save."

2. Add an Item:

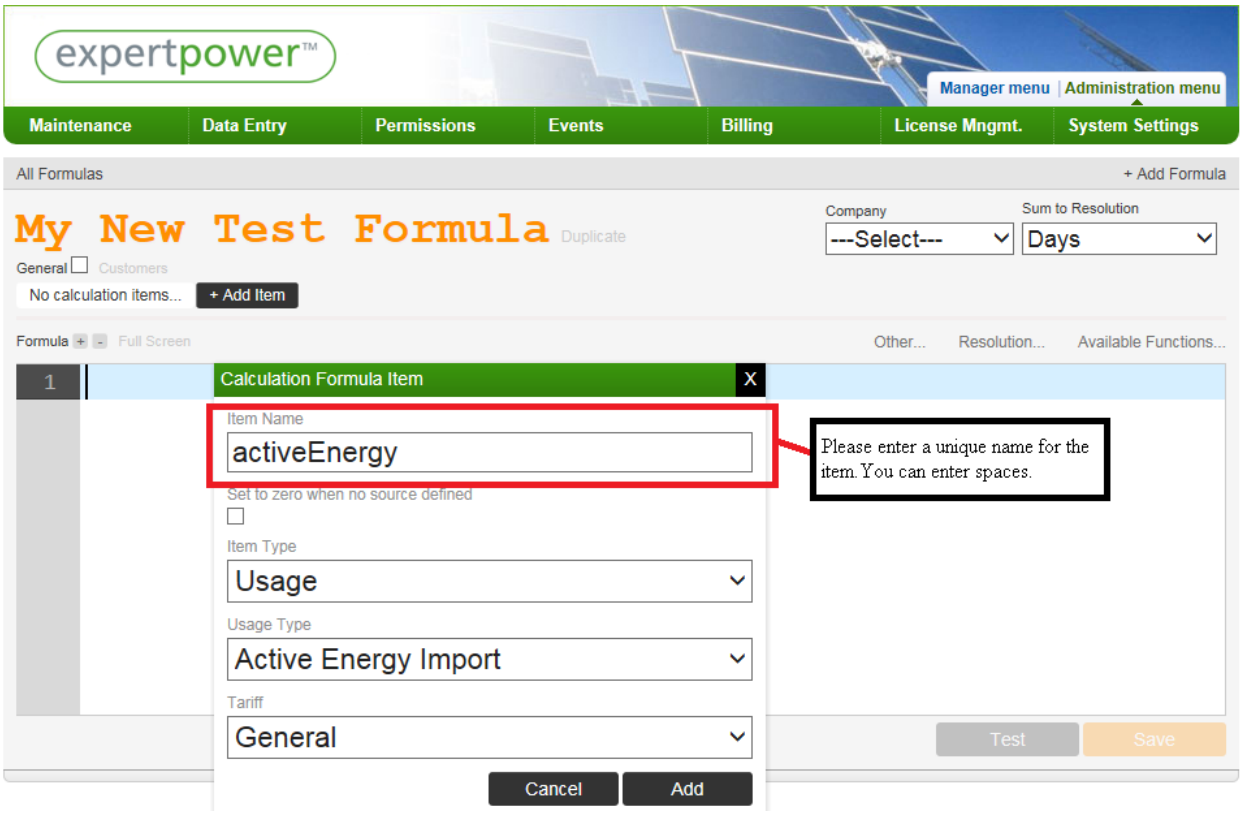
An item represents a type of data you want to include and use in the formula. See below for details regarding each available item type.



A. Clicking on Add Item opens a window:

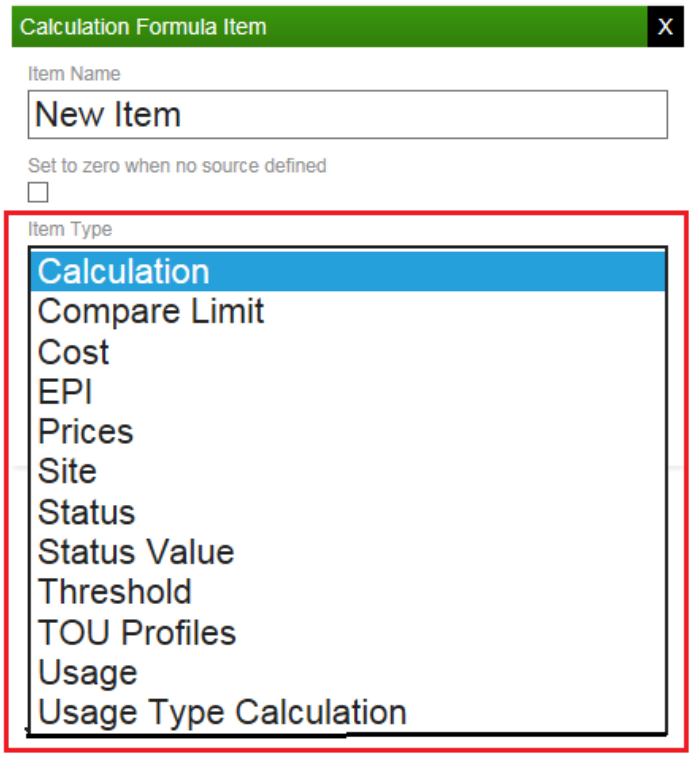
Enter an Item Name:

Please enter a unique name for the item. You can enter spaces.



Item Type

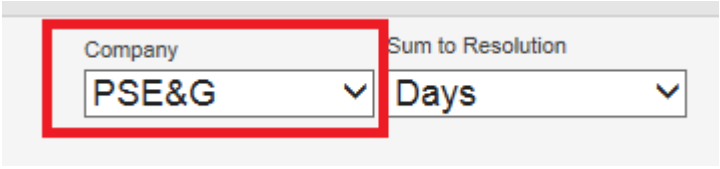
Clicking on Item Type opens a list of available item types:



1. Usage – Usage represents data read from a device such as active energy import, export, max demands etc. After selecting the usage type, a tariff can be selected.

If you need to associate the tariff based on what is defined in the price for each line in the payment program, you must select the "From Variables" options.

Please note: The tariffs list is presented , once you set up the relevant Electric Company

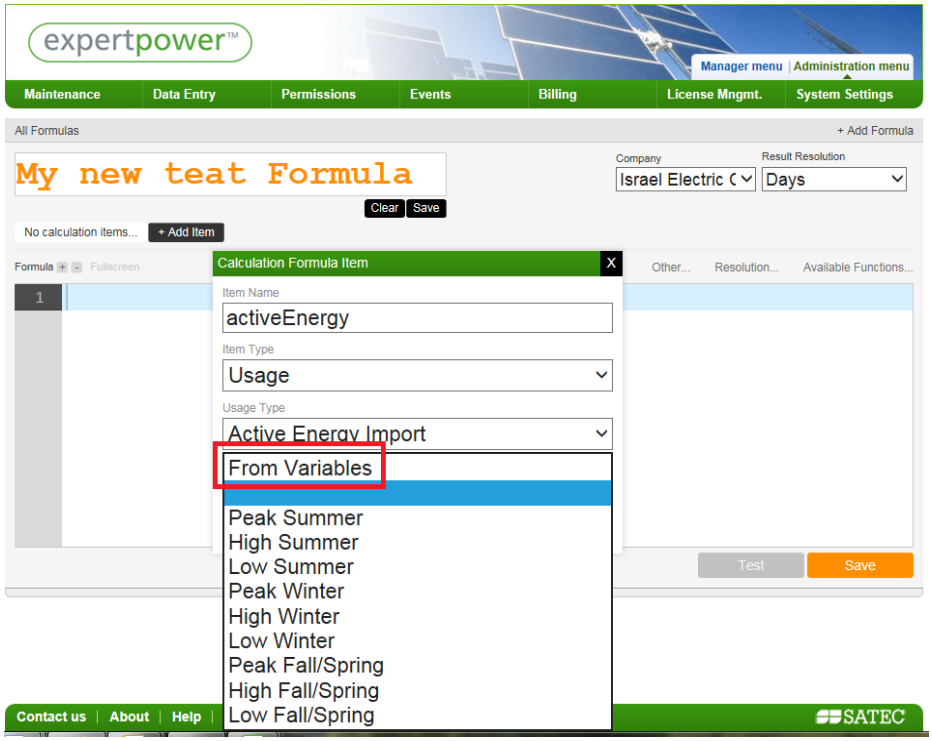


2. Usage Type Calculation – represents a calculation performed on usage data. A list of available calculations appears below.

Usage Type and Tariff is Active : According to Usage Type and tariff I chose Returns true if the tariff is active.

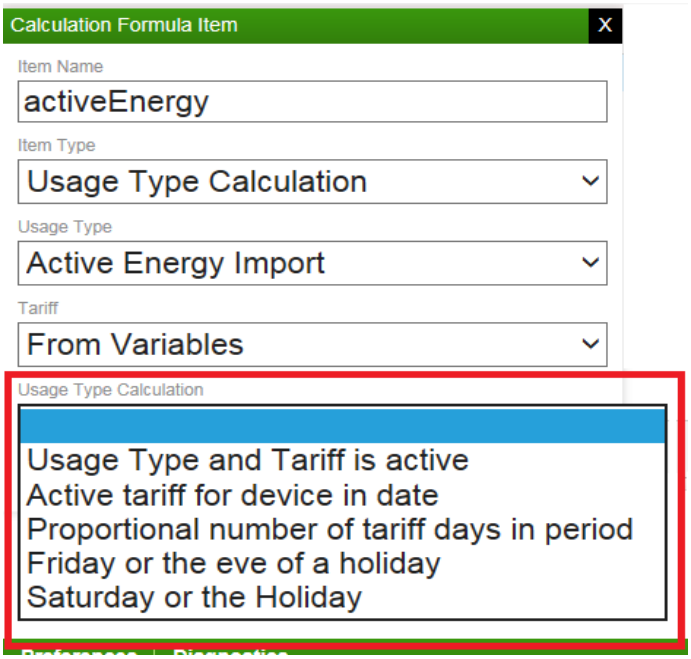
Active tariff for device in date: Summarizes the number of times the tariff is active for the device in date.

Proportional number of tariff days in period: Summarizes the proportional number of days in the period, to the same tariff



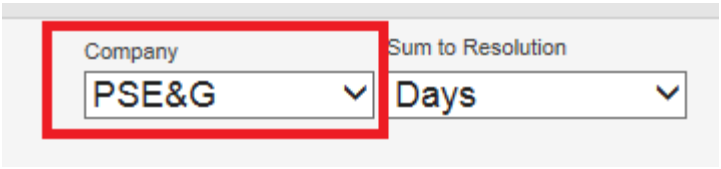
Friday or the eve of holiday: Summarizes the energy on Fridays and holiday eves when the tariff is special

Saturday or Holiday: Summarizes the energy on Saturday and holiday when the tariff is special

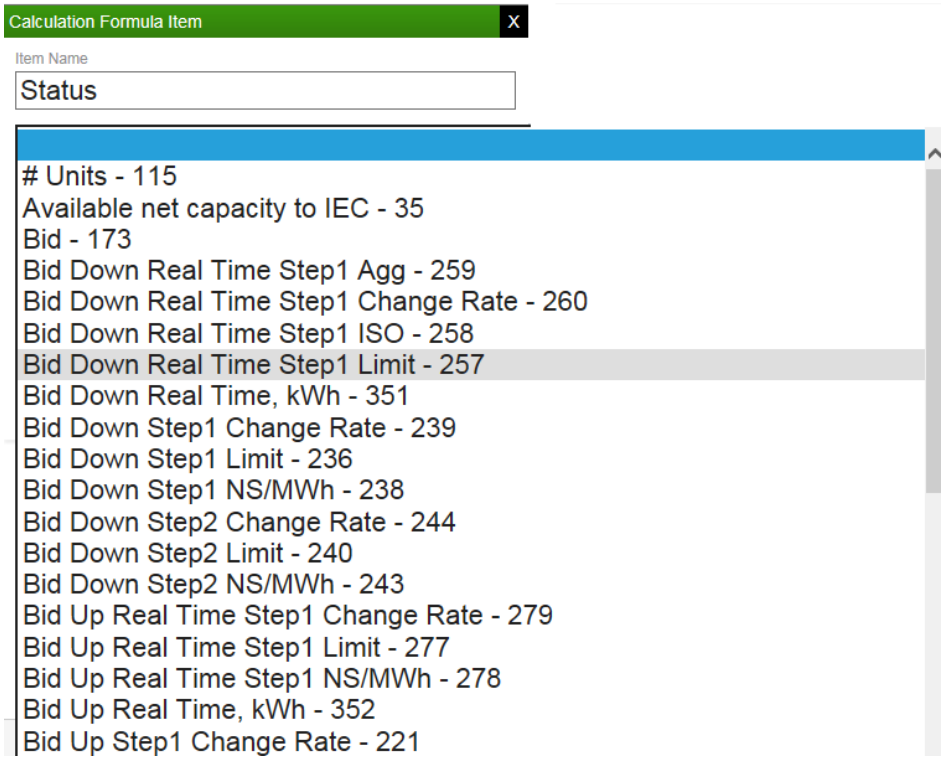


3. Threshold - Threshold from the available thresholds list.

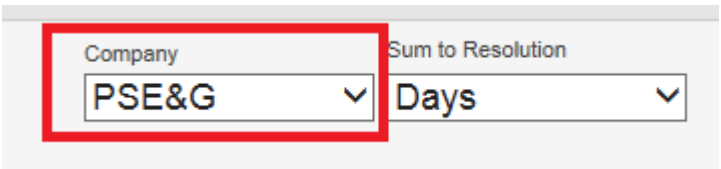
Please note: The threshold list is presented, once you set up the relevant Electric Company.



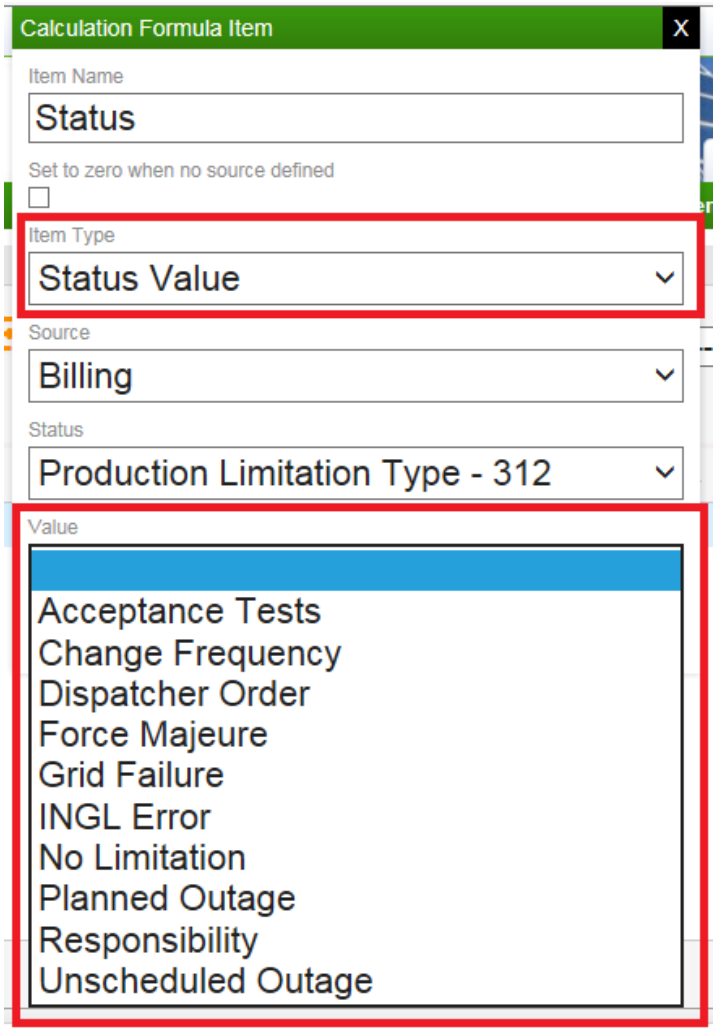
4. Status – A status represents an object from a selection of available objects definitions. Its value is entered by external interfaces and is mainly used in power plant management projects. Next to each status appears its identification number.



Please note: The status list is Presented , once you set up the relevant Electric Company.

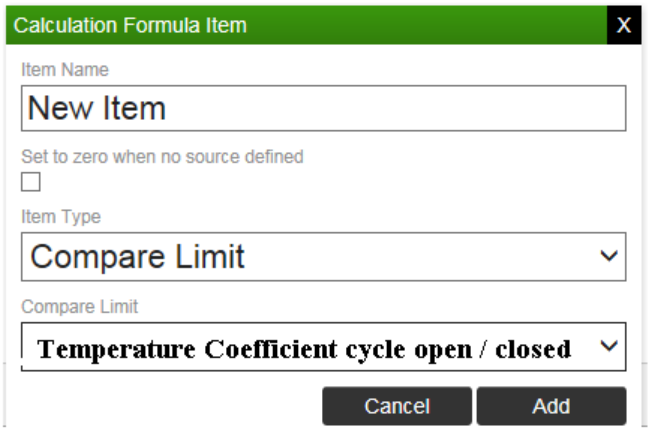


5. Status Value - statuses have a choice of several options. The Item returns a value of true if the status has the value of the selected option.



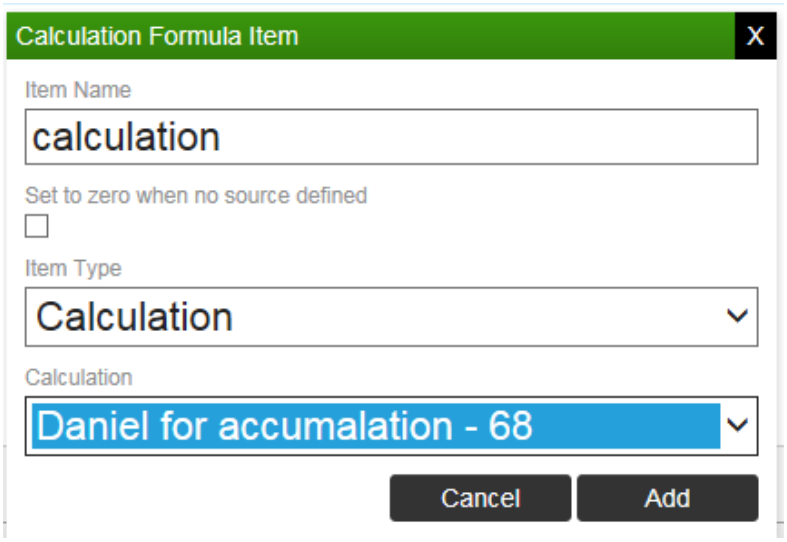
6. Compare Limit – this is a set of values used to transform a result.

e.g. in the example below a value of 10 to 15 will be tranformed to 50. A value between 10 and 30 will be transfomed to (50 + (100 - 50) * (value – 10) / (30 - 10))

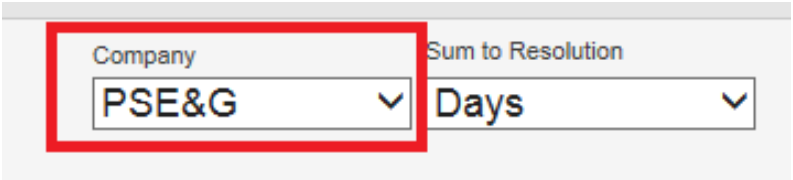


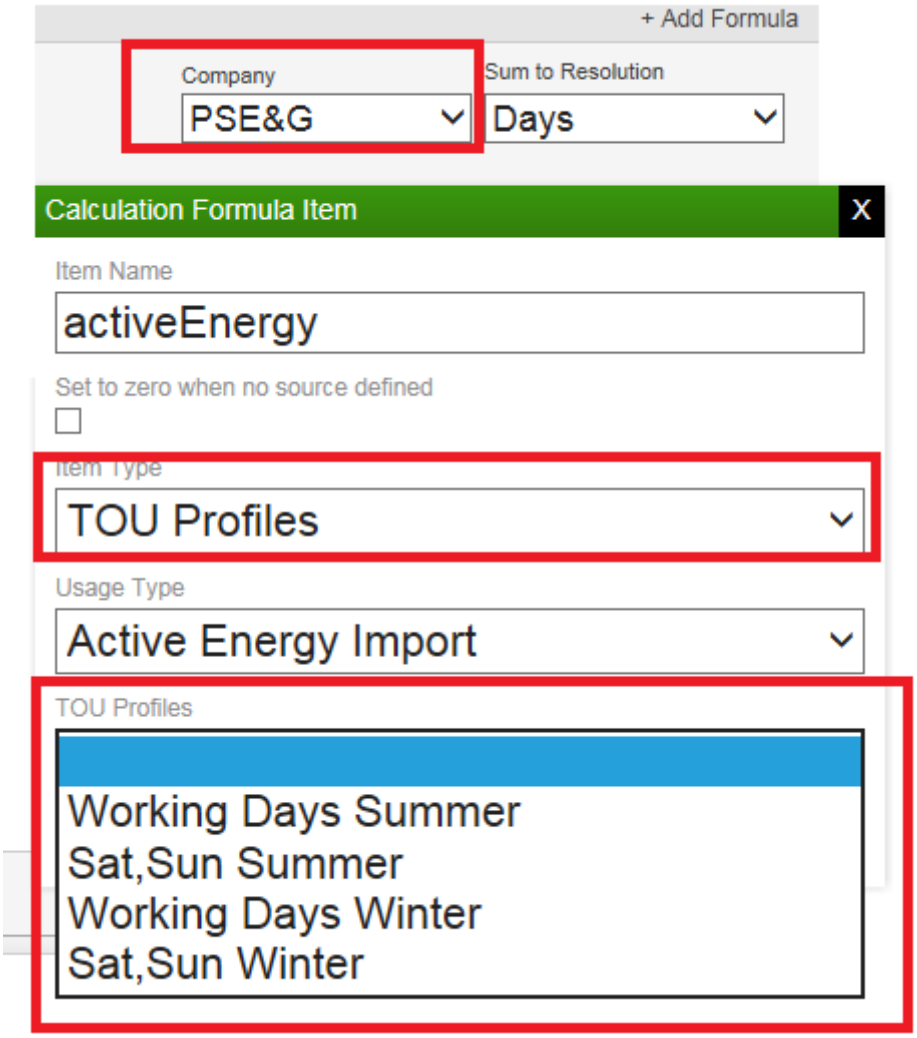
LowerLimit	UpperLimit	Value
	10	50
10	30	100
30	50	300
50	70	500
70	1000	700
100		1000

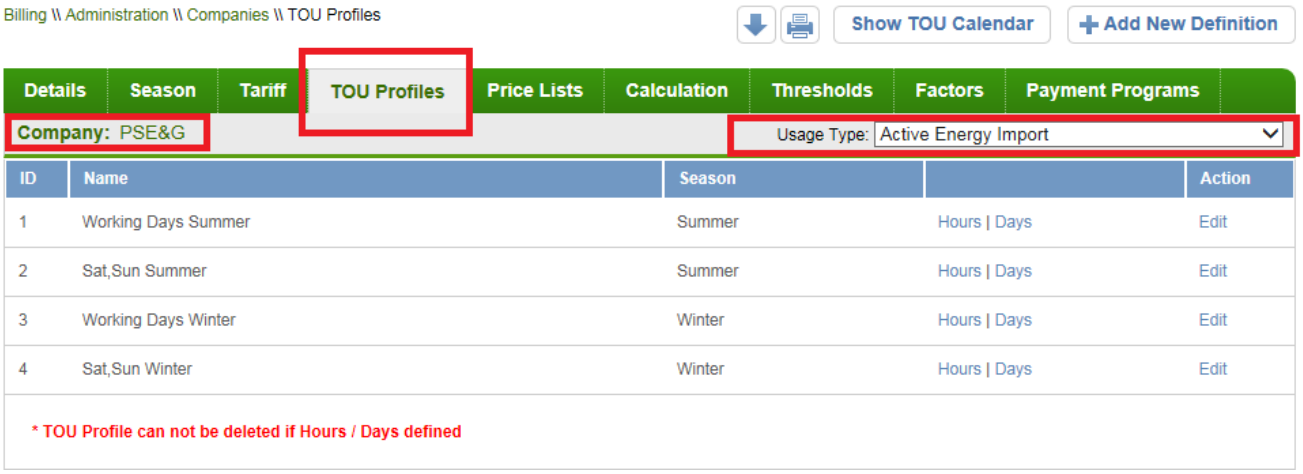
7. **Calculation** - using another formula's results as the base data.



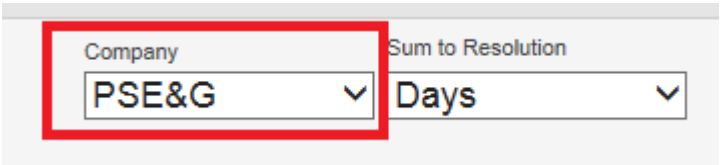
8. TOU Profile – the TOU Profiles list is based on the selected Electric Company.



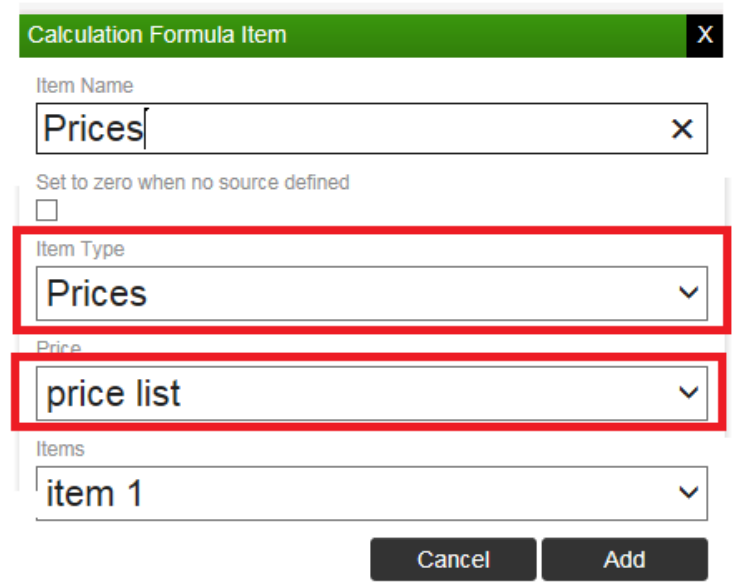


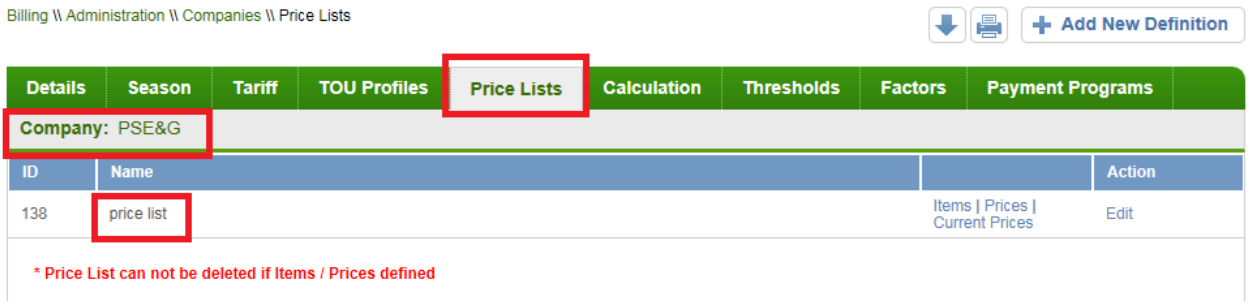


9. **Prices** - The prices list is based on the selected electric company.

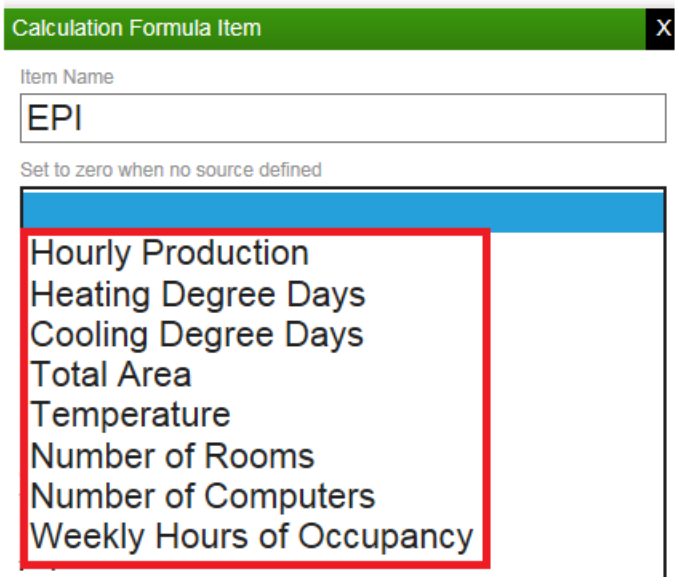


This item is based on the price lists that were defined for the company.



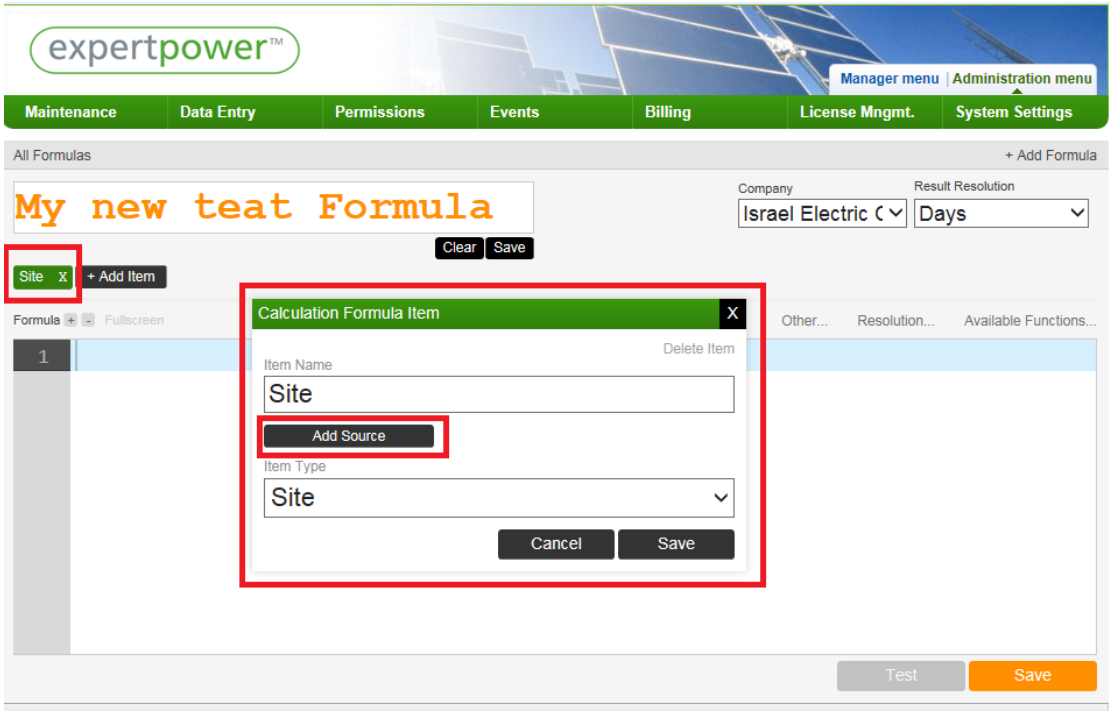


10. EPI- EPI (Energy Performance Indicators) data are additional data properties for customer / device. They can be used for the calculation.



11. Site – Selecting a site. The site can then be used to sum data for all the devices in the site.

After creating an item of type "Site", click on the Item to choose the source of the data. Clicking on the item will open a popup window. Click on “Add Source”:

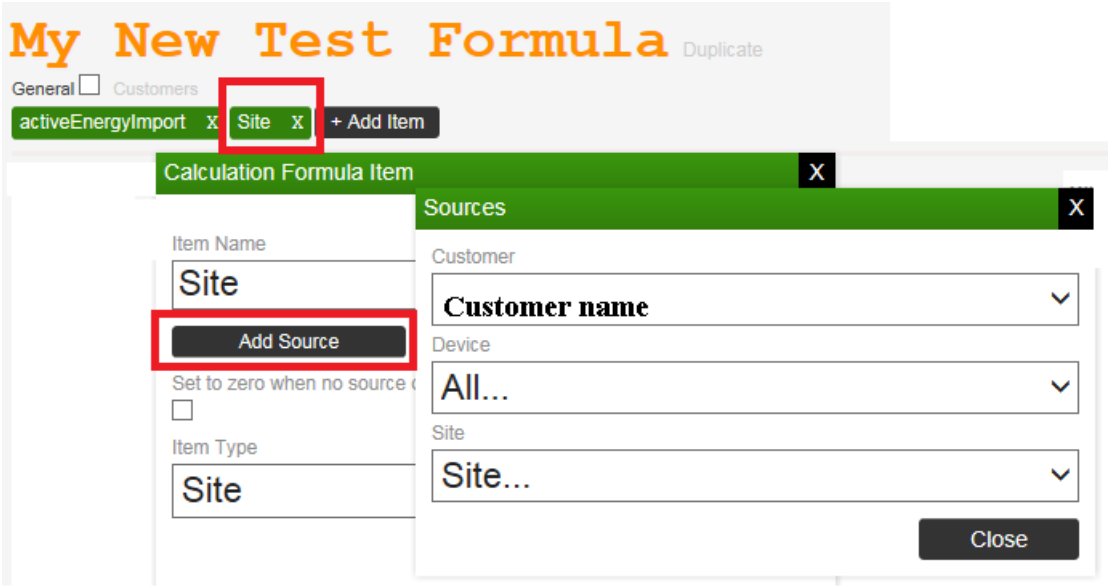


Steps to set a data source for site item:

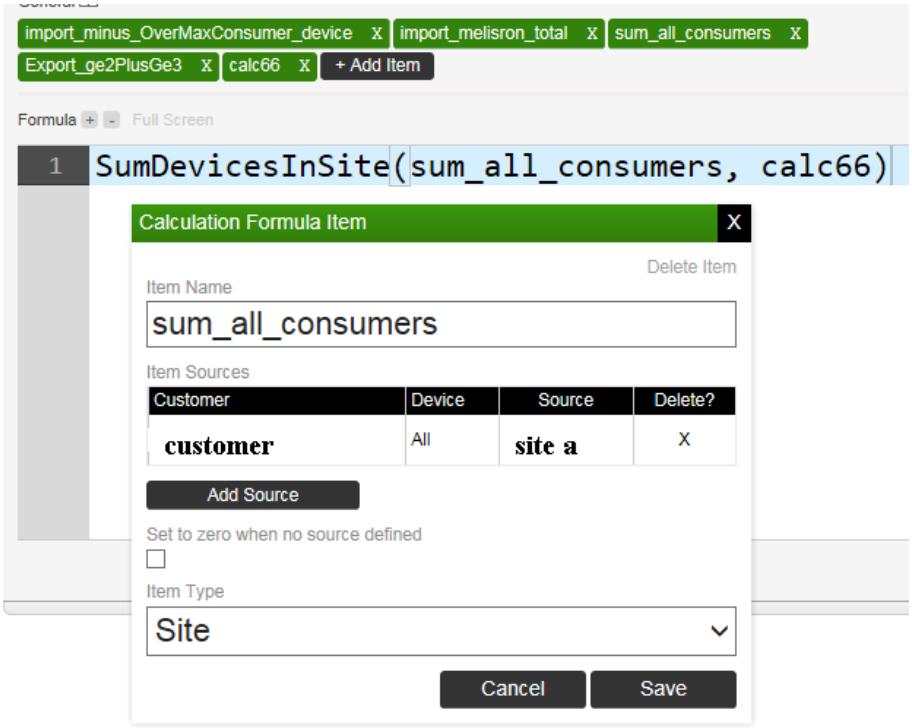
1. Select the customer

2. Select the device you want to associate with a source site. If the same definition is needed to all the customers’ device, select “All…”

3. Select the site.



For Example: Make a summary of all the results that obtained with calculation 66 for each device in "site a"



Adding a data source

Because the formulas are general formulas and can be used for different customers and different devices , the source of the data can be set for each customer / device.

The option to add source is possible for each Item, and it is optional.

If you do not enter the source, the source will be the device for which the invoice is being produced for.

Steps to set a data source:

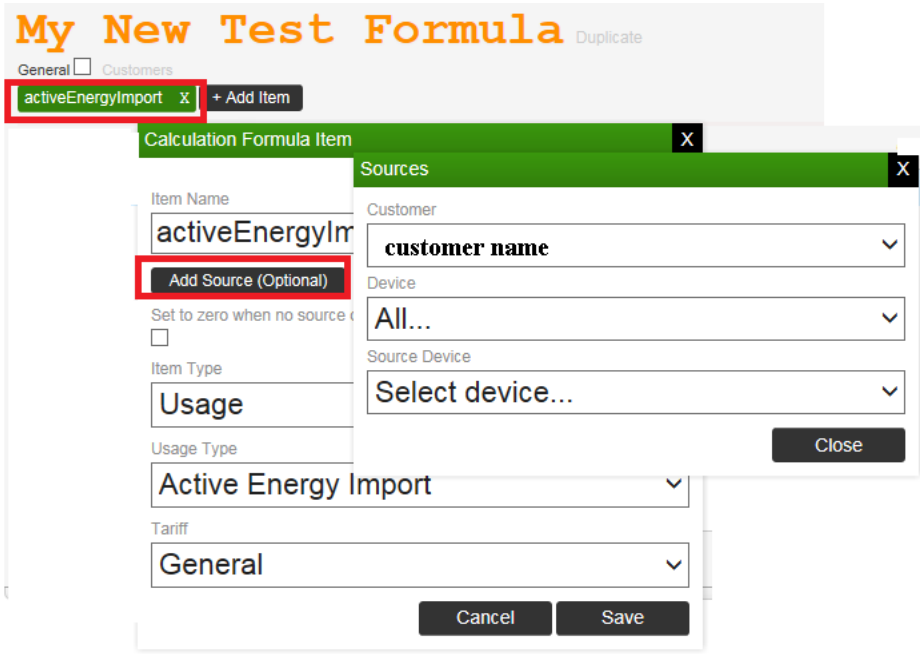
1. Click on the Item

2. Click on "Add Source"

3. Select the customer

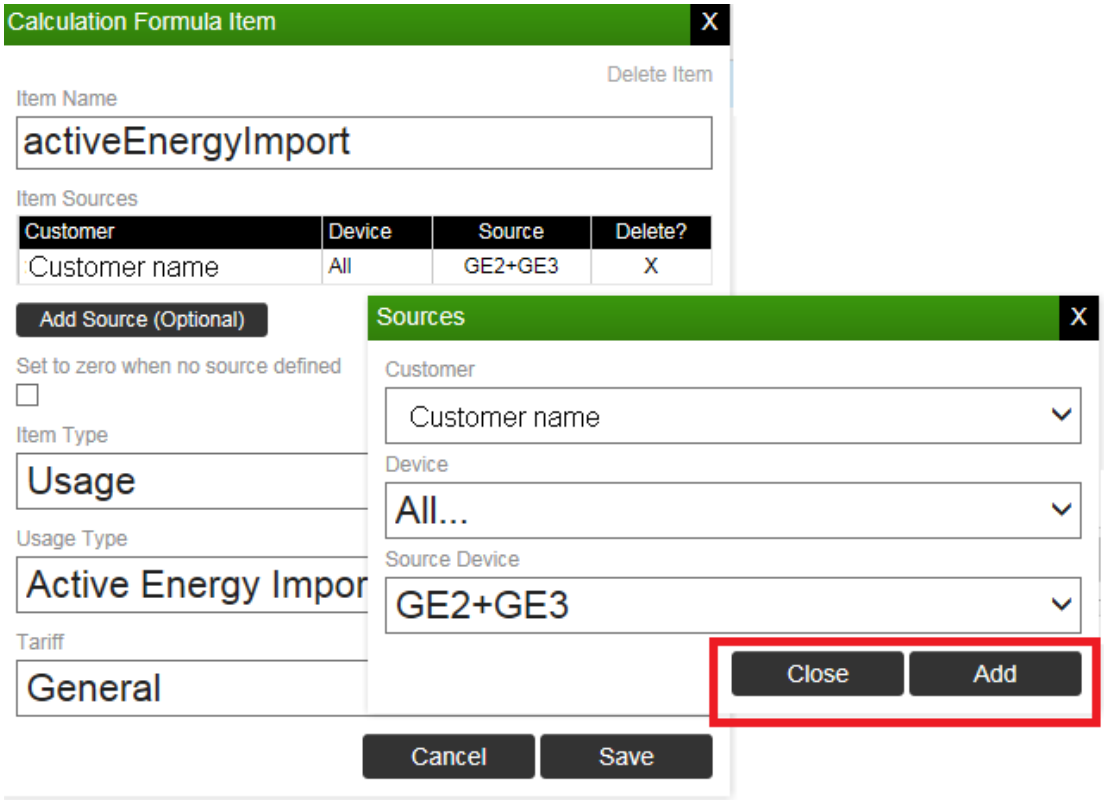
4. Select the device for which you will select the source. If you want the same source for the whole customer - select "All".

5. Select the device.



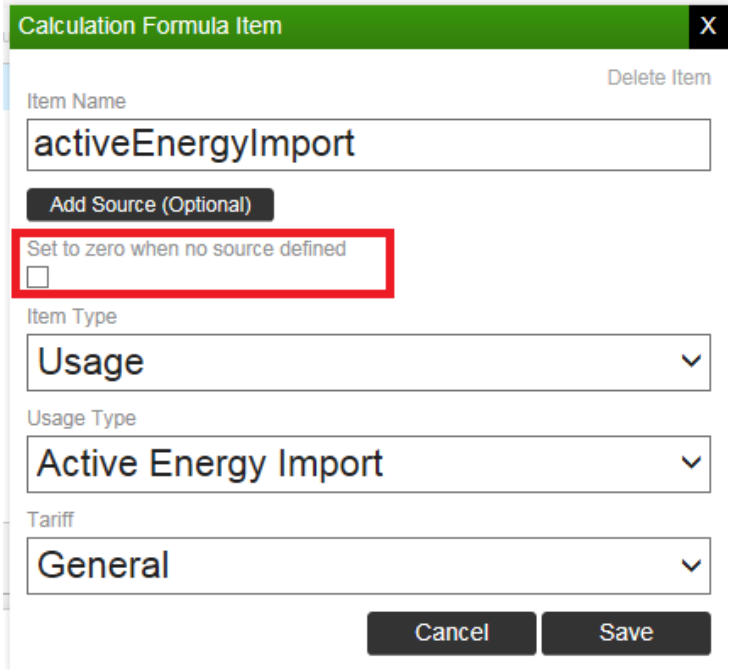
After entering the source, click on Add.

You can enter multiple sources at one time.



Set to Zero When no source defined

Use this option if you want the data to be retrieved only for devices for which you have defined a source. For other devices the data will be set to zero. This is in order to create a formula in which there are devices that have two sources and devices with a single source.



3. The construction of the formula

Building formula is done using the following window:

The formula is a script-like definition. The script is written using the various functions and objects that are available on the lists. As well as all the items that were added in the previous step.

Available Functions:

Hovering over “Available functions” will display a window with the available functions.

Common commands:

The creation of **conditions**:

if (condition, on-**true**, on-**false)**

This function evaluates the condition if it evaluates to true it returns the “on true” expression otherwise it returns the “on false” expression.

For example: If the export less or equal to threshold 18 the result is item calc66 else the result is item sumcslc66

```
if (activeEnergyExport <= tr18,
        calc66, SumCalc66)
```

Min0 (exp1)

if the result of the expression **exp1** is negative return 0 .

For example: The following expression will return 0.

```
Min0( -1)
```

SumDevicesInSite (Site, Expression)

Summarizes the value of **Expression** for all the devices in the chosen site.

For example:

SumDevicesInSite(site1, calc66)

accum (expression, accum Resolution, result Resolution)

This function returns the accumulated value of "**expression**" from the beginning of the period. The beginning of the period is defined by "**accum Resolution**". The "**result Resolution**" is the resolution of the results.

For example: Return the sum of "activeEnergy" from the beginning of the year for each month.

accum(activeEnergy, year, month)

min (a, b) / max (a, b)

Min / max between the two parameters.

For example: The next expression will return 1.

min(1,2)

min (expression, resolution) / max (expression, resolution)

Checking the minimum / maximum within a certain date range.

For example: Show me the maximum value of the item max demand over the last year

max(MaxDemand,year)

sum (dataItem, resolution)

Summarize data within the date range defined by the resolution.
For example: Sum all data in item "deviation" for each month.

sum(Deviation, month)

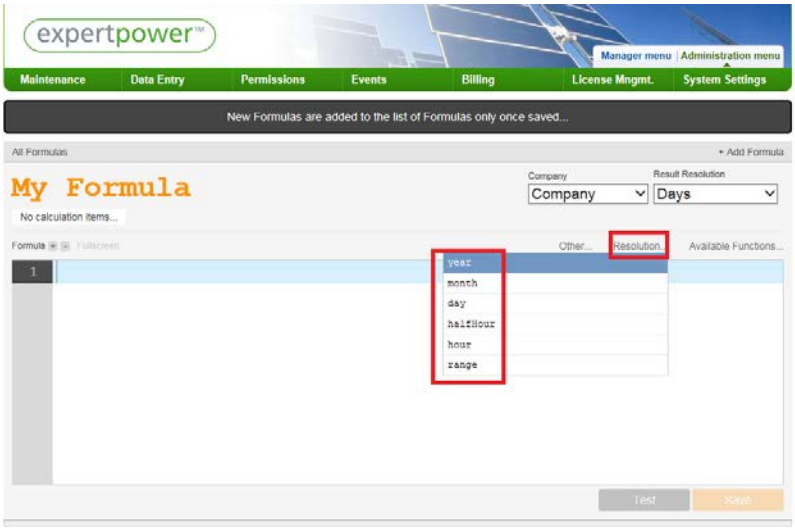
First Exists (exp1, exp2)

Returns the value of the first expression which evaluates to a value that is not null (i.e. has data).
For example: The next expression will return 1

FirstExists(null, null, 1)

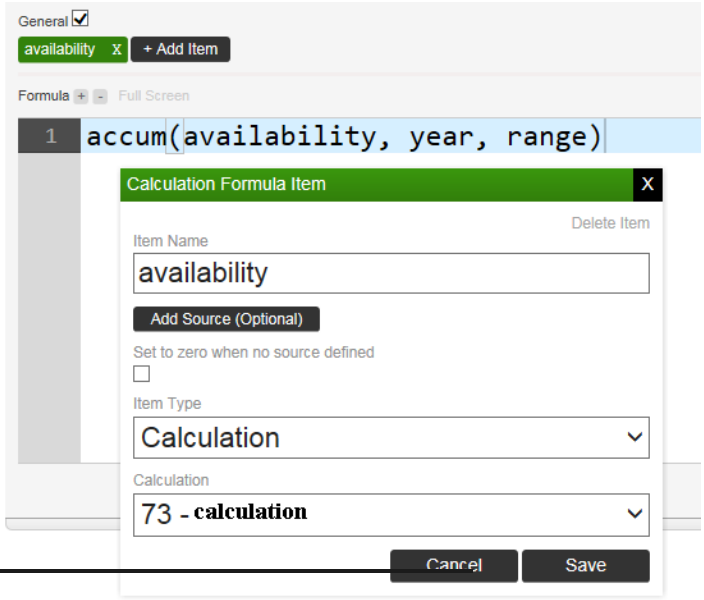
Resolution:

The list of resolutions is : “half hour”, “hour”, “day”, “month”, “year”, “range”.



Other

For example: Accumulate values from the beginning of each year.



Other: More options of expressions that can be used in the formula for calculation

For example: If any (one of the items) exist so give 1 if not 0

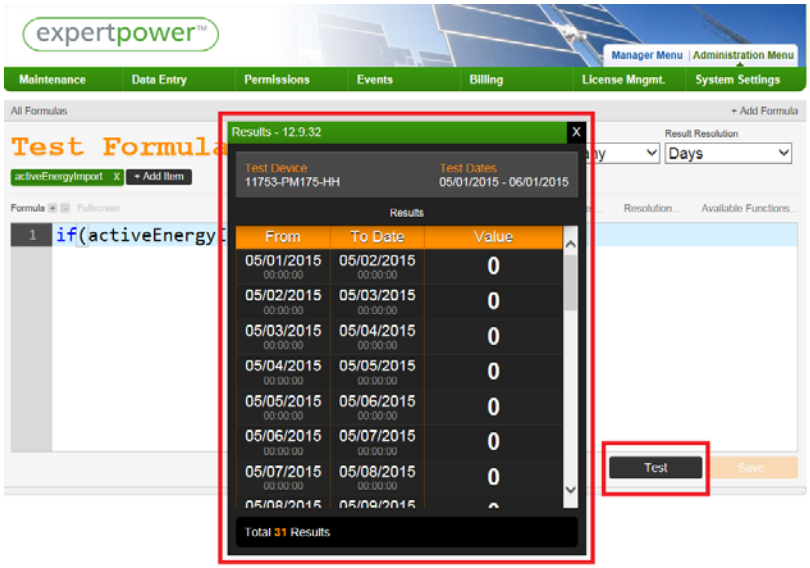
if(SF354UO or SF353PO or SF318PO,1,0)

4. After creating the formula, click Save

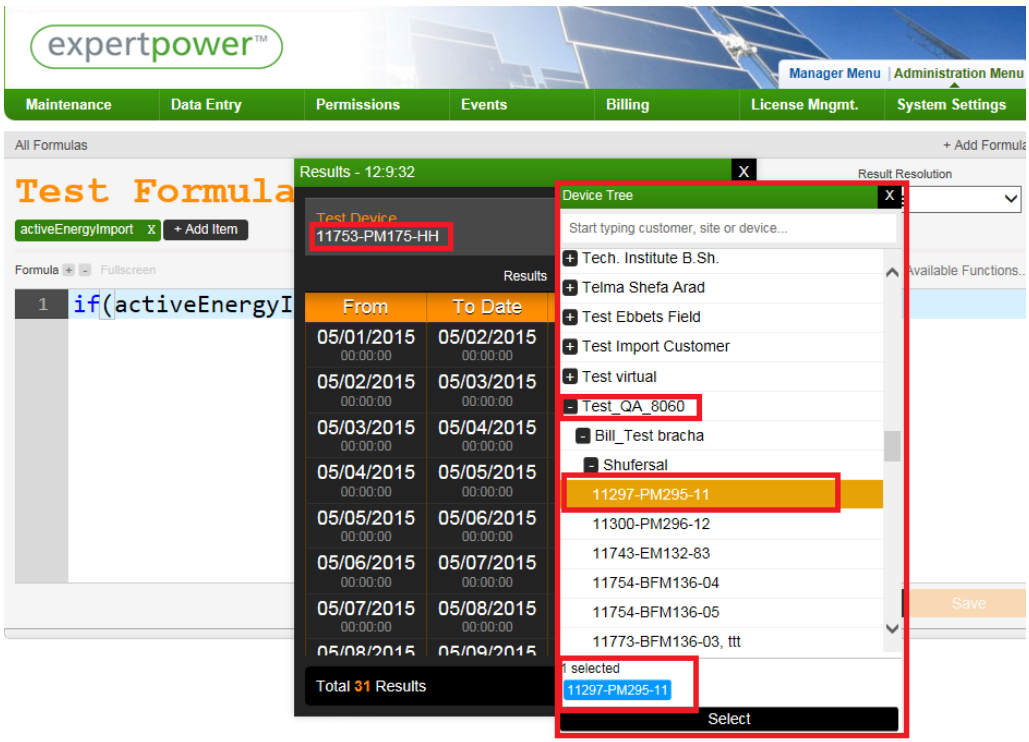
After saving, the “Test” button is enabled. This serves as a test tool to see the formula results in action.

5. Test

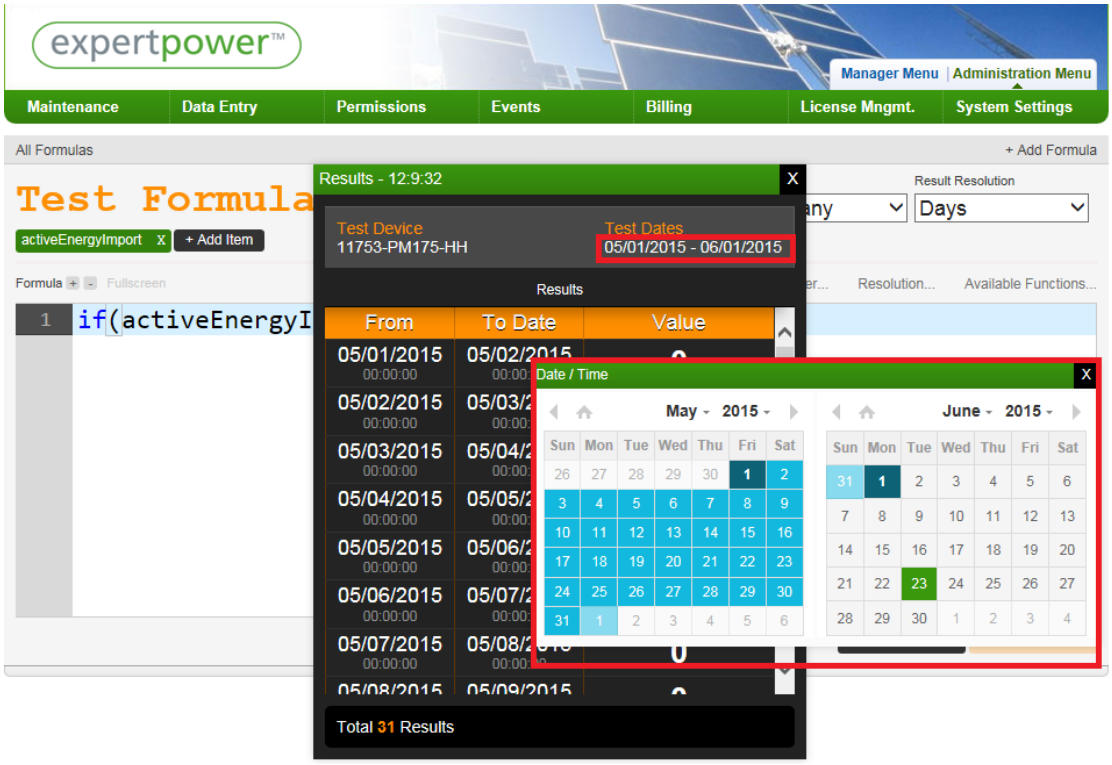
Clicking on testing opens the results window



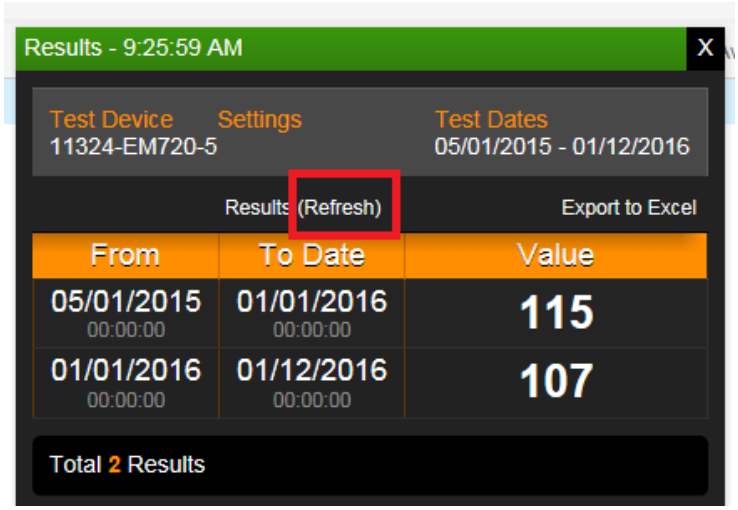
Clicking on the name of the device opens a window that allows changing the tested device. Choosing a new device, and pressing the "Select" changes the selected device and the results are updated accordingly:



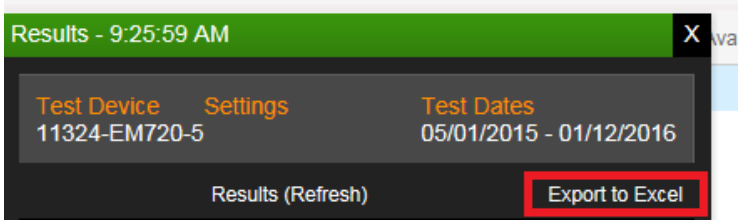
Clicking on the “Test Dates” allows changing the tested date period:



Control Refresh - To refresh the test results after making some changes.

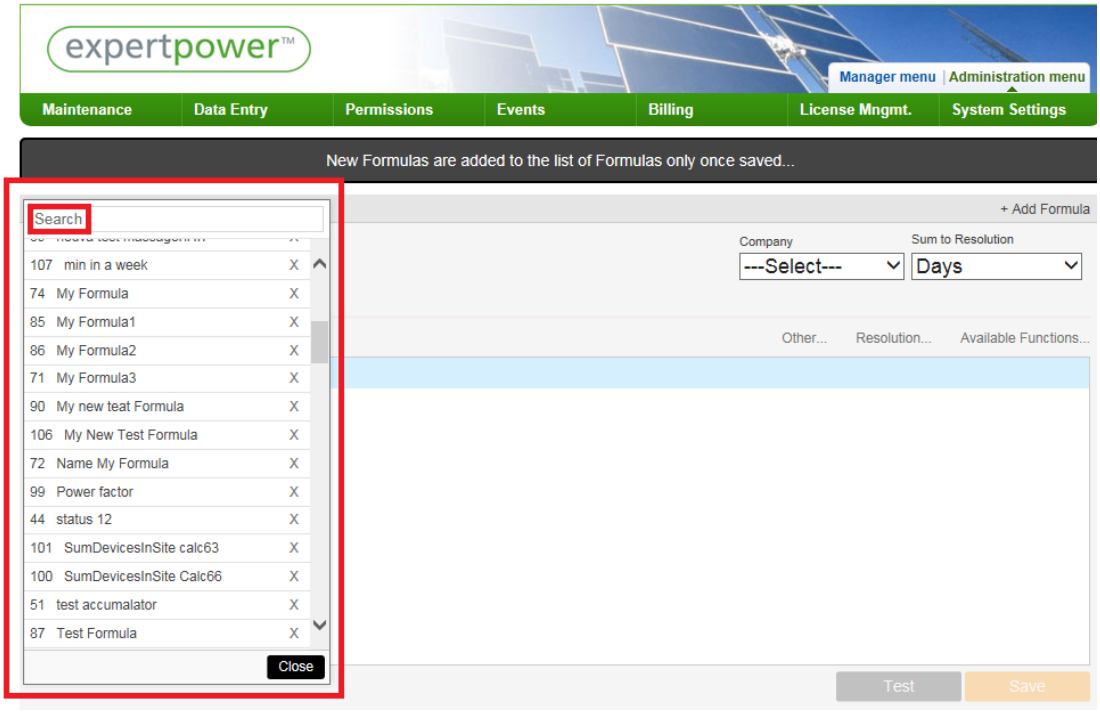


You can export the results of the Test **Excel** file



Clicking on "All Formulas" displays the list of all available formulas with the number of formula.

You can search for a formula exists, by using the "Search"

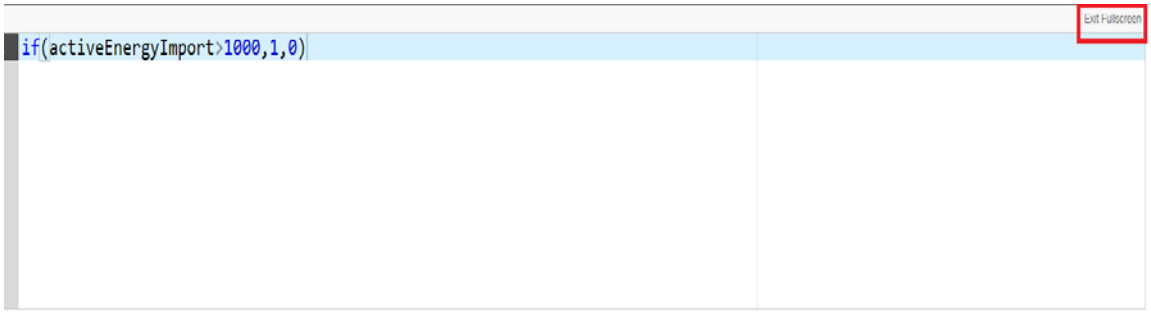


To Add a new formula click on "Add formula".

Duplicate a Formula

You can duplicate an existing formula, by clicking on Duplicate. When clicked, a new identical formula is created.

Full Screen

You can click on **full screen**, to switch into full screen mode.

To return to normal screen mode, click on "**Exit full screen**"