

# expertpower™



## ExpertPower 5.x User Manual

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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

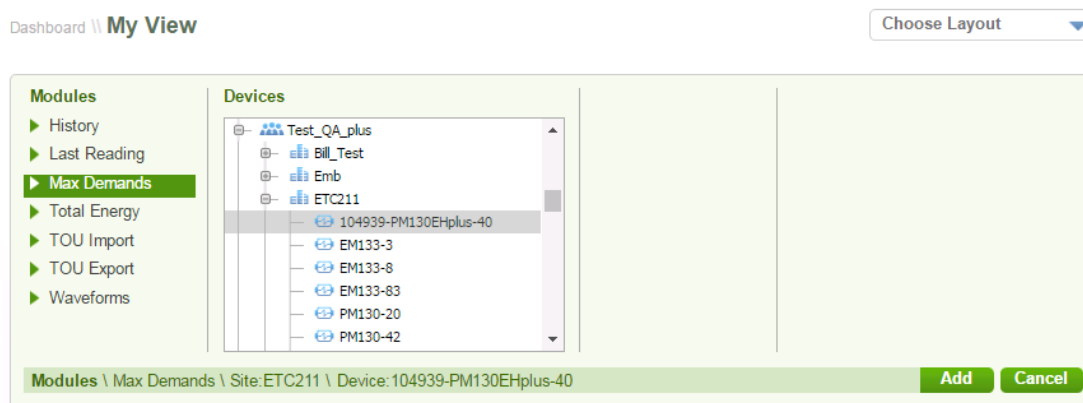
The main view has two optional layouts – the Box view and the Map view. The Box view allows you to concurrently present data from multiple devices, and the Map view show a map of your metering devices. You can switch between the two via the Choose layout menu on the upper right corner.



### 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.

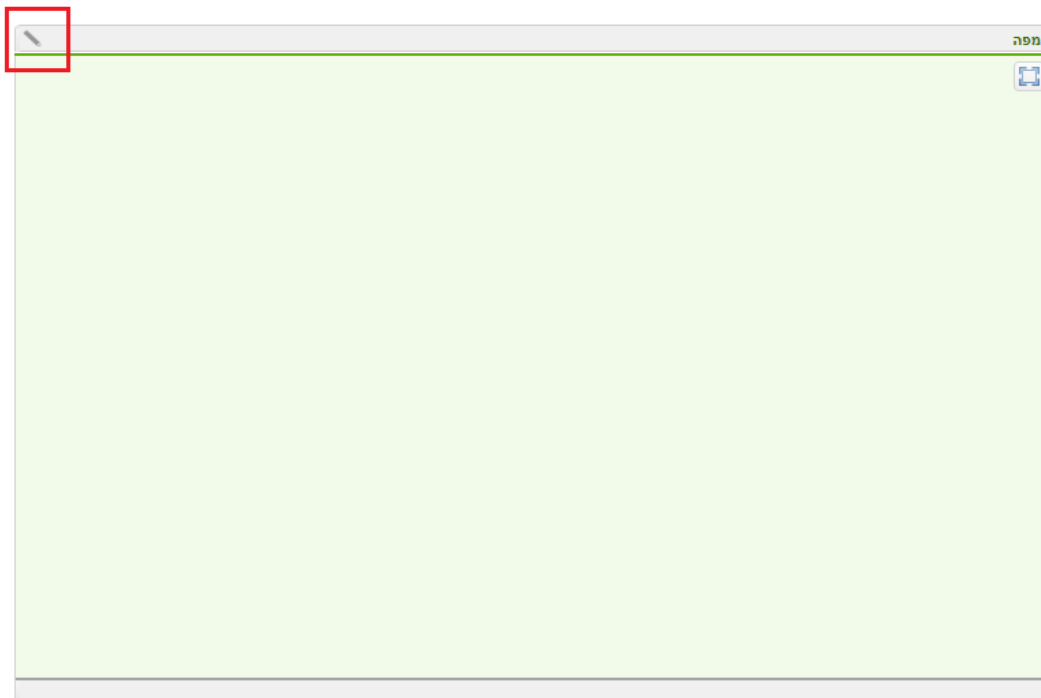


1. Select the view contents according to the current user permissions
- 2 Select the devices of choice from the device selection tree
- 3 Select the type of information to show
- 4 Click Add to complete
- 5 Click Cancel to cancel out

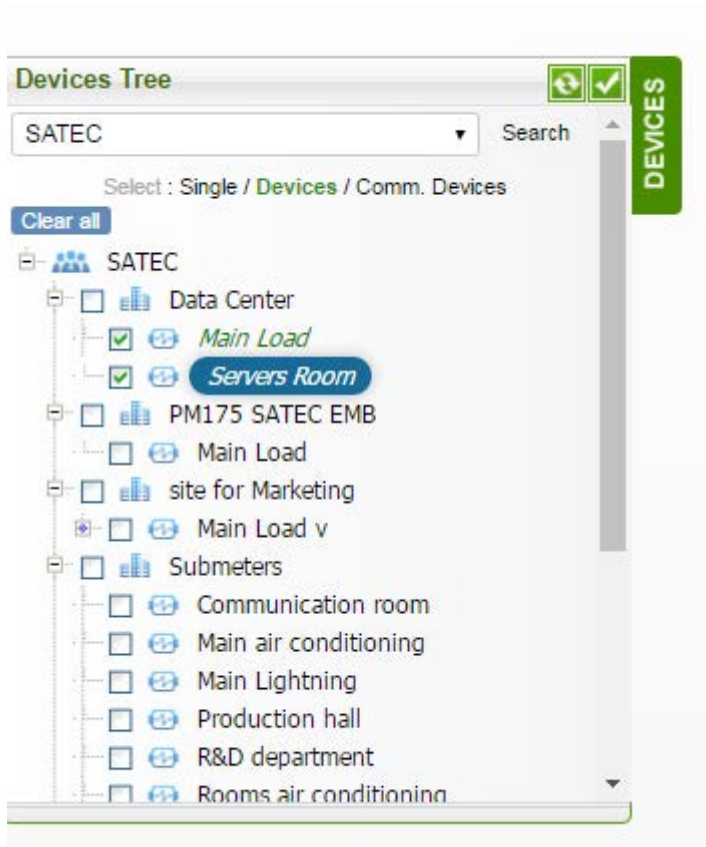
Click the View button at the bottom of every box to zoom in on that box by going to the dedicated specific page related to it. For example – clicking on View below the Last reading box will open a tab with the Last reading page for the device defined for the box.

### 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.

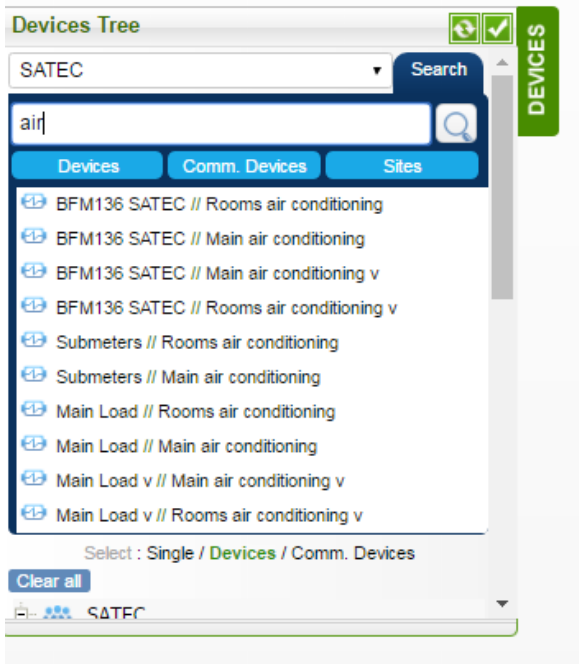
### Devices

Allow to select one or more device from the tree.

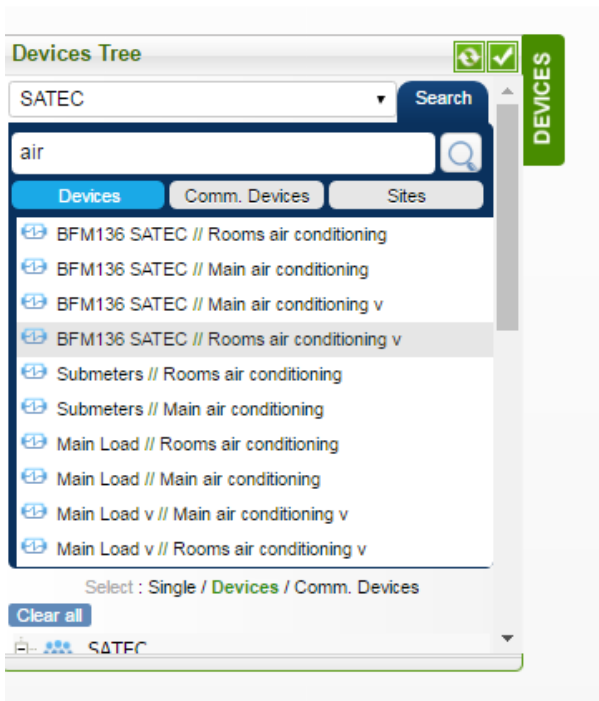
### Comm. devices

Allow to select one or more communication device.

## Search the Tree




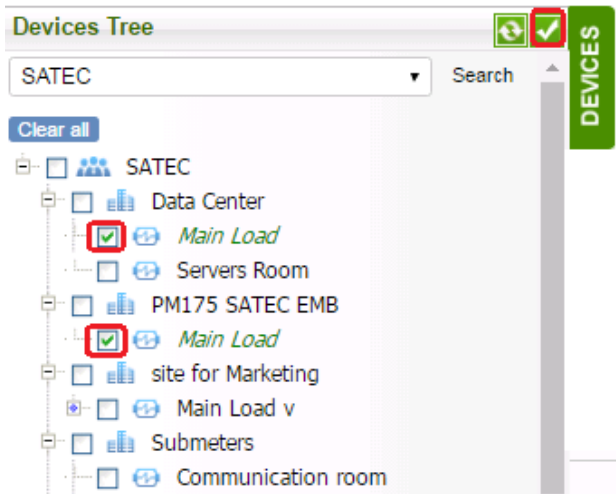
The Search option appears on the top of the Device selection tree. It applies to one or more of the three categories: Devices, Comm. Devices and Sites. Only selected categories (appearing in blue) will be included in the search. In order to exclude a category from the search, click it and it will turn 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:





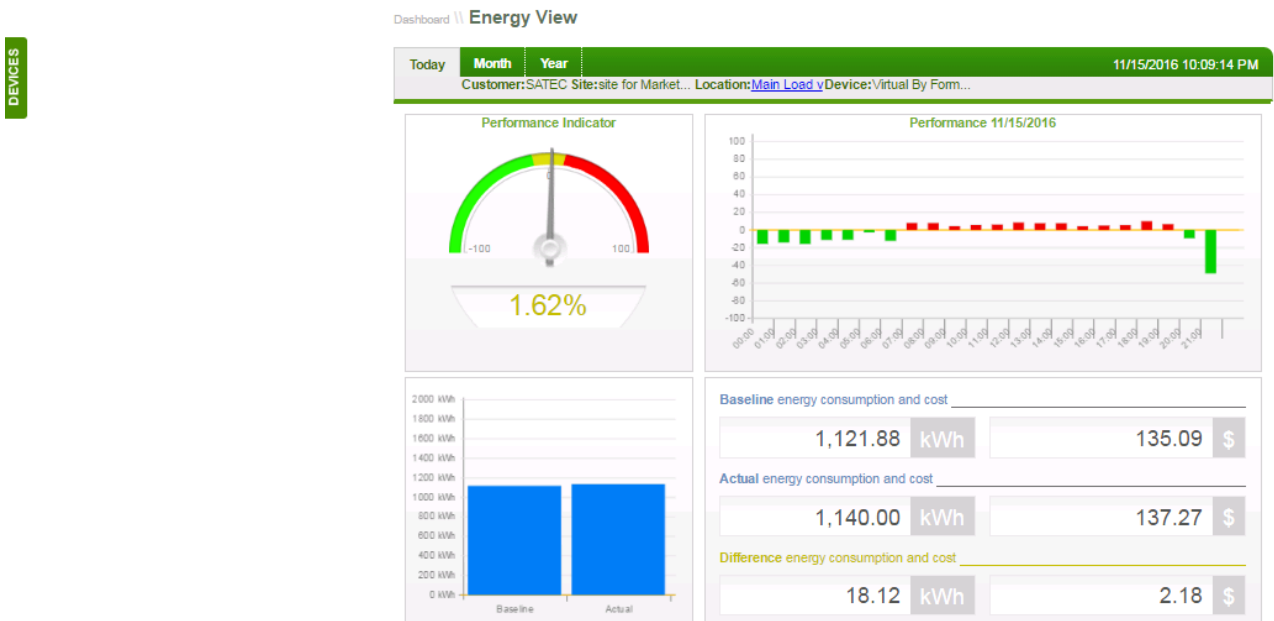
## Device selection

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.

Readings \ Last Reading

Browse readings

Customer:SATEC Site:site for Market... Location:Main Load v Device:Virtual By Form... 11/15/2016 22:30

Phase Basic Measurements					History
Phase	L1	L2	L3	Unit	
Voltage (Primary)	235	237	236	V	
Current (Primary)	64.68	37	31.59	A	
Active Power	15.2	8.64	7.45	kW	
Reactive Power	0.298	1.49	0.298	kvar	
Apparent Power	15.2	8.77	7.46	kVA	
PF	1.0	0.985	0.999	PF	

Total			History
Name	Value	Unit	
Active Power	31.29	kW	
Reactive Power	2.09	kvar	
Apparent Power	31.36	kVA	
PF	0.998	PF	

Total Demands			History
Name	Value	Unit	
Power Demand	31.29	kW	
kVA Demand	31.29	kVA	

### 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.

Readings \ History

Parameter tabs

Date: 11/9/2016 - 11/16/2016

Phase Power & Demand Customize

Customer:SATEC Site:site for Market... Location:Main Load v Device:Virtual By Form...

Graph

Select Parameter

Display/Hide graph

Voltage Trend

Voltage

Current

Active Power

Reactive Power

Apparent Power

PF

225

## 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
	L1	L2	L3	L1	L2	L3	L1	L2	L3	
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					Total		
Phase	L1	L2	L3	Unit	Name	Value	Unit
Voltage LN (Primary)	233.2	234.9	234.5	V	Active Power	9.46	kW
Current (Primary)	7.72	14.52	21.64	A	Reactive Power	3.5	kvar
Active Power	1.39	3.22	4.94	kW	Apparent Power	10.13	kVA
Reactive Power	1.2	1.2	1.1	kvar	PF	0.939	PF
Apparent Power	1.78	3.41	5.04	kVA	Frequency	49.97	Hz
PF	0.762	0.937	0.974	PF	Neutral Current (Primary)	13.52	A

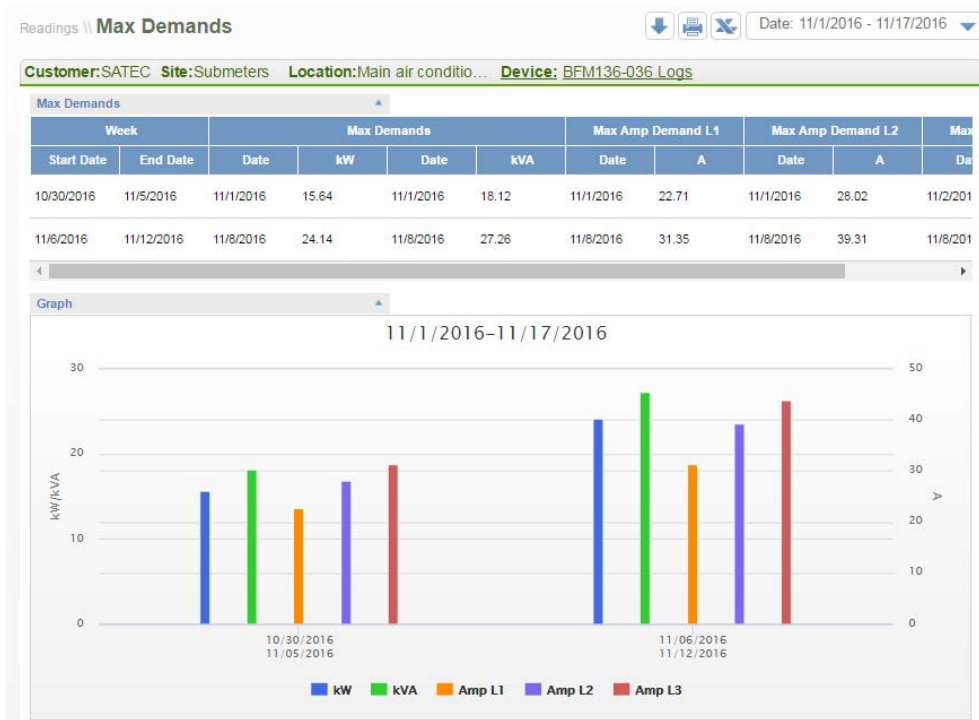
Energy			Demands				
Name	Value	Unit	Phase	L1	L2	L3	Unit
Active Energy	49,345	kWh	Max Amp. Demand (Primary)	31.36	39.32	43.8	A
Active Export Energy	0	kWh					
Apparent Energy	61,732	kVAh					

Total Demands		
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:

Readings \ Max Demands Date: 11/1/2016 - 11/17/2016

Time Range | Fixed Time

Start Date: 11/1/2016 End Date: 11/17/2016 Resolution: Weeks

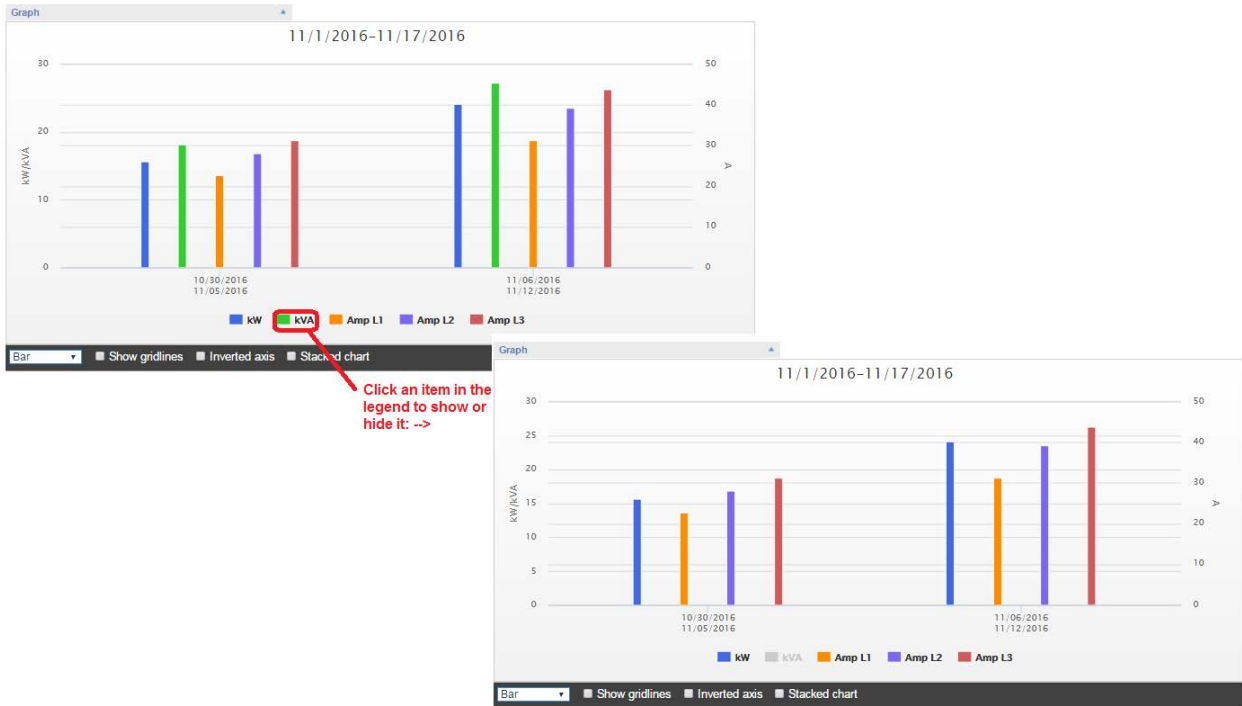
If you select the Fixed Time option, you can select a specific year of choice from a dropdown:

Readings \ Max Demands Date: 11/1/2016 - 11/17/2016

Time Range | Fixed Time

Year: 2016 Resolution: Months

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:

The screenshot shows the ExpertPower Manager Administrator interface. The top navigation bar includes 'Dashboard', 'Readings', 'Events', 'Consumption', 'Power Quality', 'Billing', 'Generators', and 'Reports'. The 'Consumption' tab is active, and a dropdown menu is open, listing usage types: Energy (Total), Water (TOU Import), Air Condition Usage (TOU Export), Gas (Total Distribution), and Fuel (TOU Distribution). On the left, a vertical sidebar labeled 'DEVICES' is visible. On the right, a table shows data for 'kWh Export' with a value of 0.

Usage Type	Value
kWh Export	0

## 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.

Consumption \| Energy \| **Total** Date: 11/1/2016 - 11/18/2016

Time Range | Fixed Time

Start Date: 11/1/2016 00:00 End Date: 11/18/2016 00:00 Resolution: Days

**Update** **Cancel**

Customer: SATEC Site: Data Center Location: Main Load Device: PM175

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:



## 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

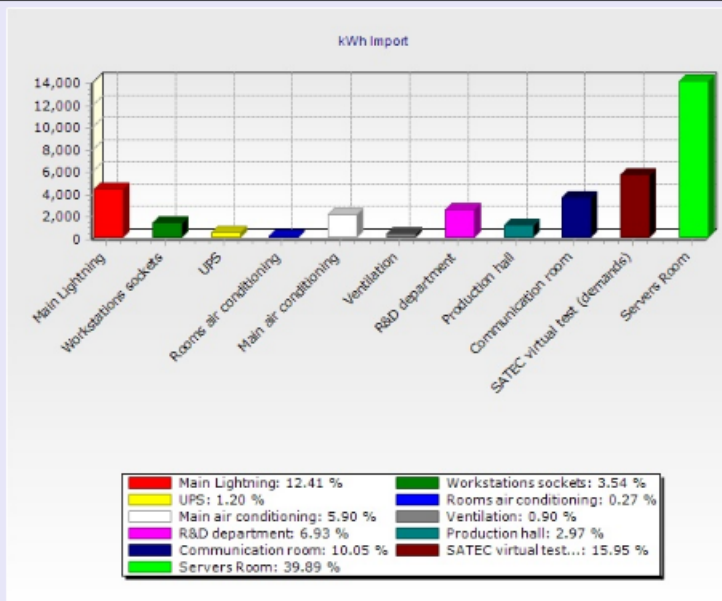
\* Complete data not available for this device

\*\* 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	
<b>Total</b>	<b>0</b>	<b>35,138</b>	<b>35,138</b>		





## 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.

Events \ **Event View** ↓ ↗ 🖨 Date: 9/5/2016 - 9/12/2016

**Customer:**SATEC **Site:**Submeters **Location:**Main air conditio... **Device:** BFM136-036 Logs

📄 📄 📄 ✖ ⏪ ⏩

📄 Info ⚠ Warning ✖ Critical

Type	Date	Category	SubCategory	Description	Info	Source	Duration	Value	Mail	Sms
📄	9/11/2016 07:52:30.163	Application	Communication	No connection to device	Communication Device BFM136 SATEC	Main air conditioning	39:42.3 min			
📄	9/10/2016 09:11:03.000	Application	Communication	No connection to device	Communication Device BFM136 SATEC	Main air conditioning	22.0 Hours			
📄	9/9/2016 08:11:02.740	Application	Communication	No connection to device	Communication Device BFM136 SATEC	Main air conditioning	1:42:47 Hours			

## 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.

Events \ **Event Log** ↓ ↗ 🖨 Date: 9/4/2016 - 9/12/2016

**Customer:**SATEC **Site:**Submeters **Location:**Main air conditio... **Device:** BFM136-036 Logs

Select Event Types

<input checked="" type="checkbox"/> Setpoint Event	<input checked="" type="checkbox"/> Setpoint activity	<input checked="" type="checkbox"/> Comm. activity	<input checked="" type="checkbox"/> Front panel activity
<input checked="" type="checkbox"/> Self-check	<input checked="" type="checkbox"/> Self-update	<input checked="" type="checkbox"/> Run-time Error	<input checked="" type="checkbox"/> Hardware Event
<input checked="" type="checkbox"/> External Event	<input checked="" type="checkbox"/> Corrupted		

**Submit**

Drag a column header here to group by that column

No	Date / Time	Description	Details	Value
222808846	9/11/2016 08:30:27.014	Comm. activity: DATA KEEPING	CLR TOU DEMD	
222808842	9/11/2016 08:30:25.493	Comm. activity: DATA KEEPING	CLR DEMANDS VOLT/AMPERE	
222808839	9/11/2016 08:30:25.427	Comm. activity: DATA KEEPING	CLR DEMANDS POWER	
222808838	9/11/2016 00:01:13.328	Comm. activity: DATA KEEPING	CLR TOU DEMD	

## 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.

Events \| **Event Summary** ↓ ✕ 🖨

Disconnected Devices	⌵
Disconnected Comm. Devices	⌵
Problematic devices requests	⌵
Problematic Total Energy	⌵
Problematic TOU Energy	⌵

Click to see related events

## Notifications

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

## Analyzed Events

Adminstrator > Events > Analyzed Events

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

Events \| **Analyzed Events** ↓ 🖨

Customer: SATEC

SATEC New

consumption event test

daniel test

EVENT TEST1 Test event

hedva test

v>235 v>235 pm175hh prod

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":

Events \| **Analyzed Events**

Customer: SATEC Event Name: Clear Back Save

**Required fields**

Event Name Field Required

Start Message Field Required

Start Message Field Required

End Message Field Required

End Message Field Required

Open Action Field Required Close Action Field Required

Warning Level

Info Warning Critical

Description

**Optional event sources**

Select Event Source

- Basic Measurements
- Basic Measurements
- ETC Event Log
- Event Log
- Generator Controller
- Energy & Demand

**Next step enabled once required fields are filled in**

Conditions

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

The screenshot shows the 'Analyzed Events' configuration interface. At the top, it displays 'Customer: Test\_QA\_plus' and 'Event Name:'. Below this, there are buttons for 'Define Event Criteria', 'Remove', 'Add', 'Back', and 'Save'. The 'Add' button is highlighted with a red box. The main area contains two rows of criteria. The first row is for 'kWh import' with a starting threshold of '>= 1000 kWh' and an ending threshold of '>= 1000 kWh'. The second row is for 'Power factor L1' with a starting threshold of '<= 0.9 PF' and an ending threshold of '>= 0.9 PF'.

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:

The screenshot shows the 'Analyzed Events' configuration interface with 'Define Time Criteria' selected. It features buttons for 'Define Event Criteria', 'Remove', 'Add', and 'Save'. The main area has a 'Day of week' dropdown menu with a '>=' operator, and two dropdown menus for 'Saturday' and 'Sunday', each with a '>=' operator.

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.

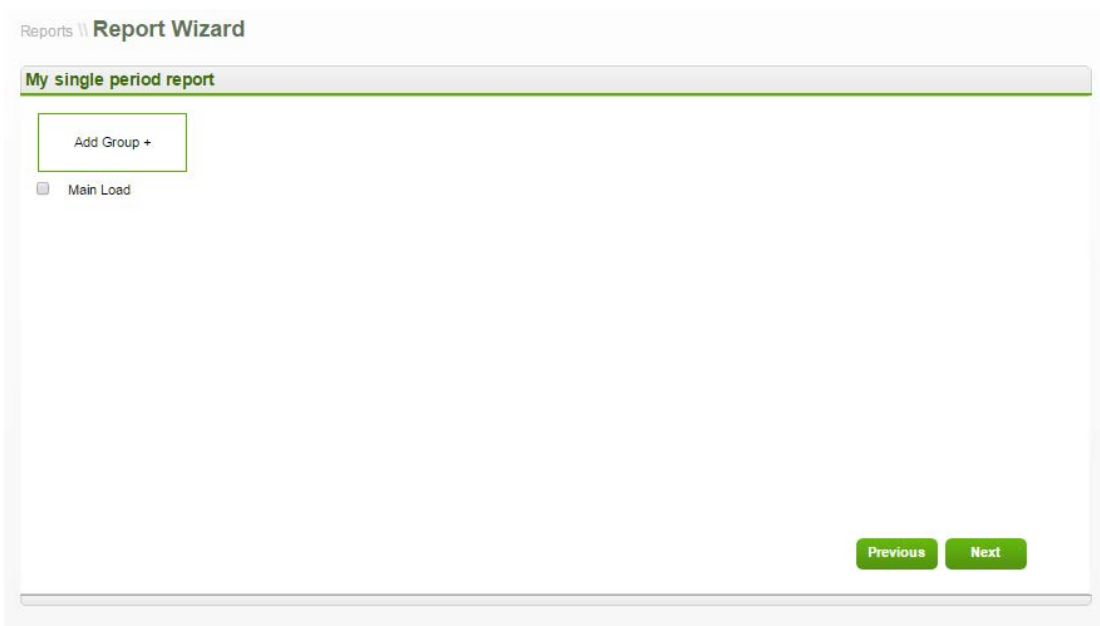
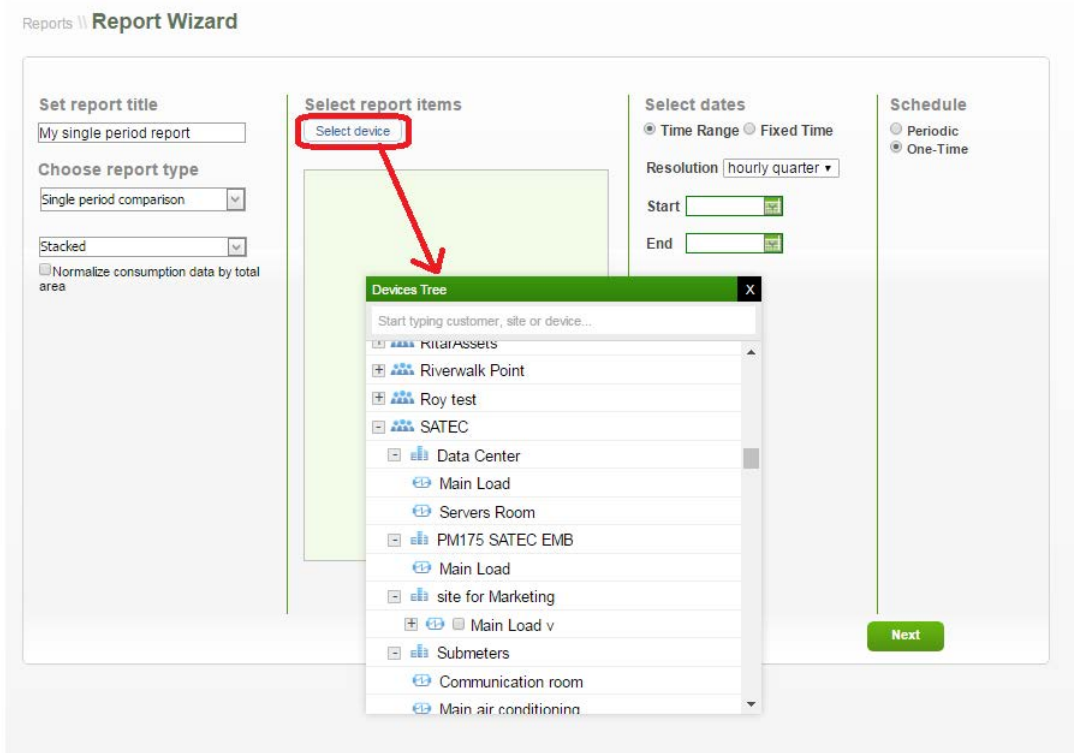
## Reports

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

The screenshot shows the 'Report Wizard' configuration page. At the top, there is a navigation bar with 'Manager Administrator' and tabs for 'Consumption', 'Power Quality', 'Billing', 'Generators', and 'Reports'. Below the navigation bar, there are buttons for 'Reports Wizard' and 'Reports List'. The main area is divided into three columns: 'Set report title' with a text input field and a 'Choose report type' dropdown menu; 'Select report items' with a large empty box; and 'Select dates' with a large empty box.

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:

**My single period report**

Group: Basic Measurements

Field: Accum. kVA Demand

Aggregate method: Minimum

Series type: Line

Buttons: Previous, Add, Create, Finish

Register group name	Usage Type	Tariff	Status Value	Field Name	Series	Aggregate	Value difference	Percent difference	Action
Basic Measurements				kWh import	Line	Minimum	×	×	Delete Edit

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:

Reports || **Reports List** + Filter List

User: mls

Number	Name	Type	Last Updated	Periodic	Completed	Action
3553	My single period report	Single period comparison	11/17/2016 6:20:56 PM	×	✓	Generate

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

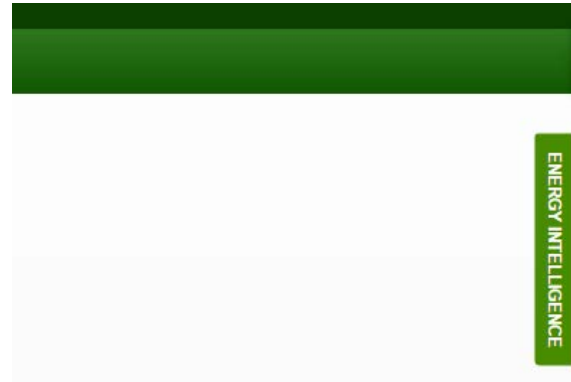
**Action**

- Generate
- Update
- Save As
- Delete
- Share
- Generate
- Export To PDF
- Export to Excel

## 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.

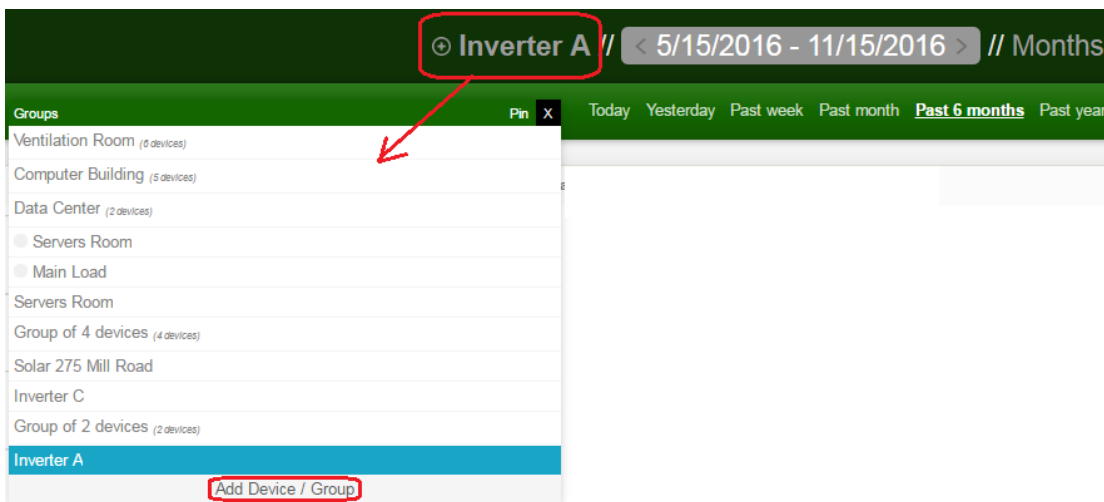
Open the Energy Intelligence module by clicking the vertical Energy Intelligence on the right hand side of the screen:



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

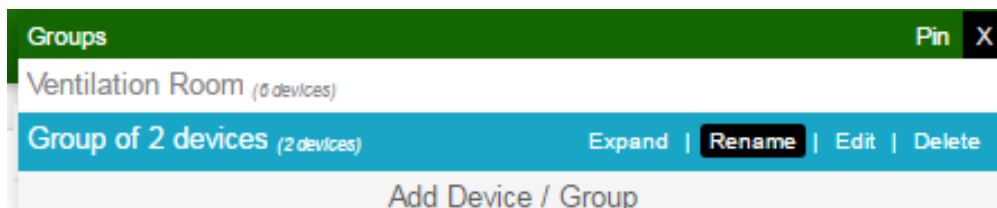


Upon clicking the Add Device/Group, the Device selection tree opens up.

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):

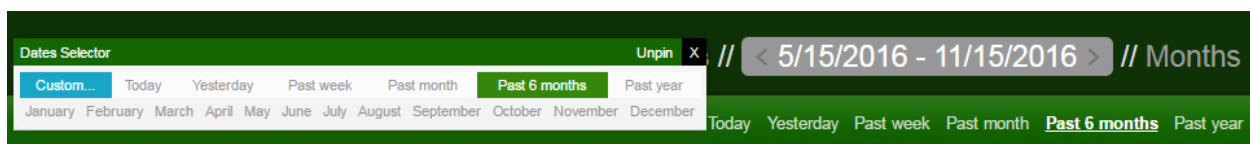


These device selection groups will remain defined under your user account unless if you decide to use the Delete option on the right hand side (see below) to delete it.

## Date selector

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

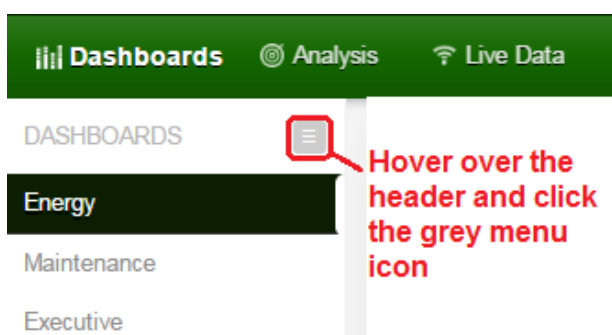
- Click the current date duration appearing on the top toolbar
- Click the current resolution
- Click any fixed duration from the list: Today, Yesterday, Past week, Past month, Past 6 months or Past year.



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

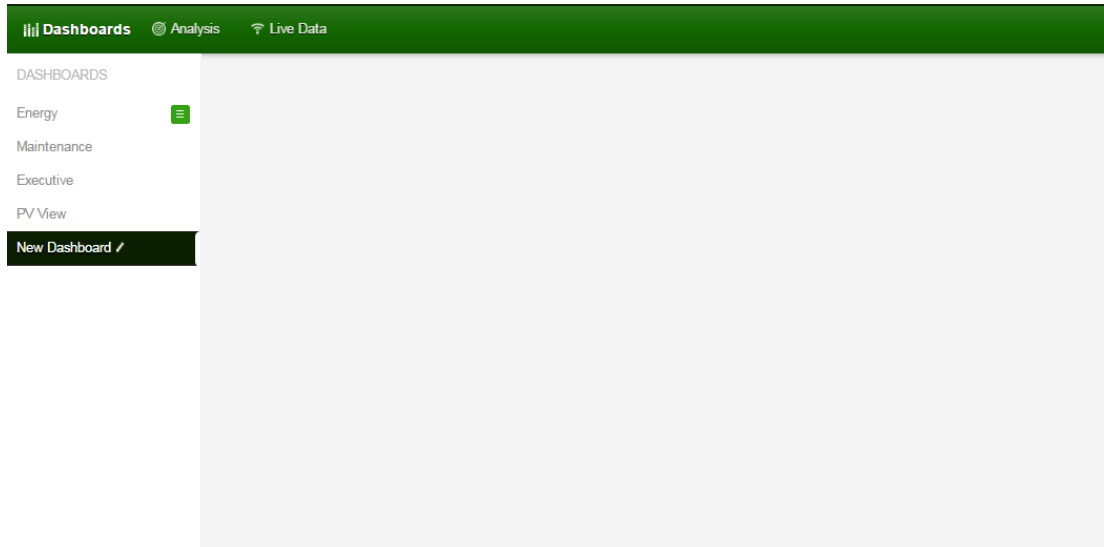
## User defined Dashboards

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

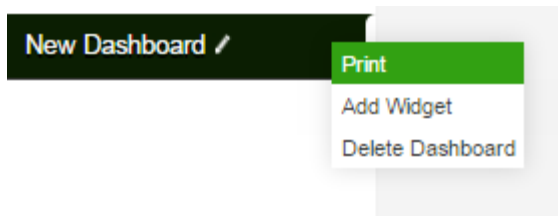


Once you click the above grey menu icon, select the Add Dashboard option that will pop up.

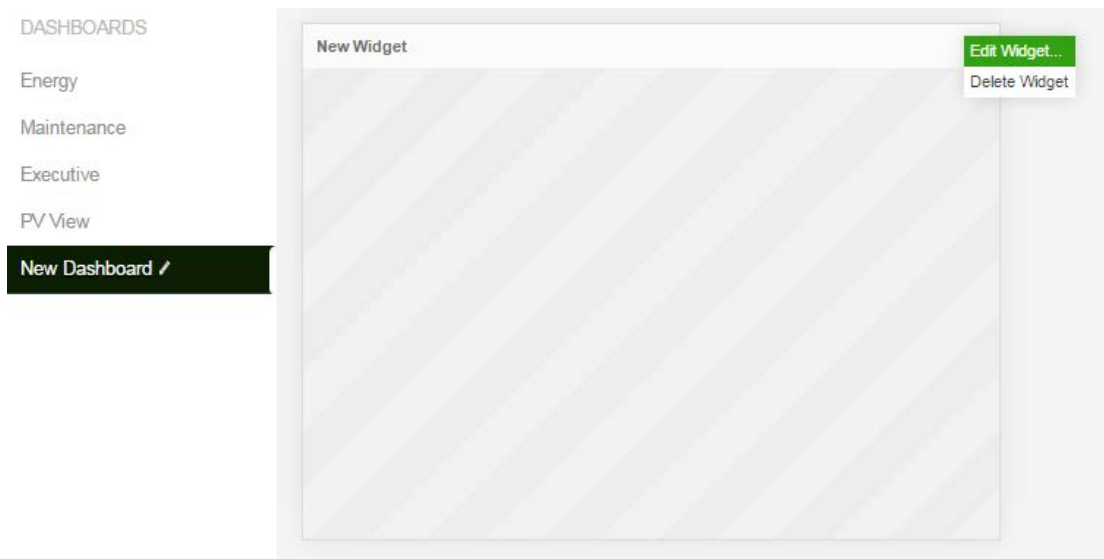
At this point a blank "New Dashboard" will become available on the left. Click to select it:



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 add more widgets to your dashboard. From the menu icon on the dashboard name you can Print it over to PDF or rename it as needed.

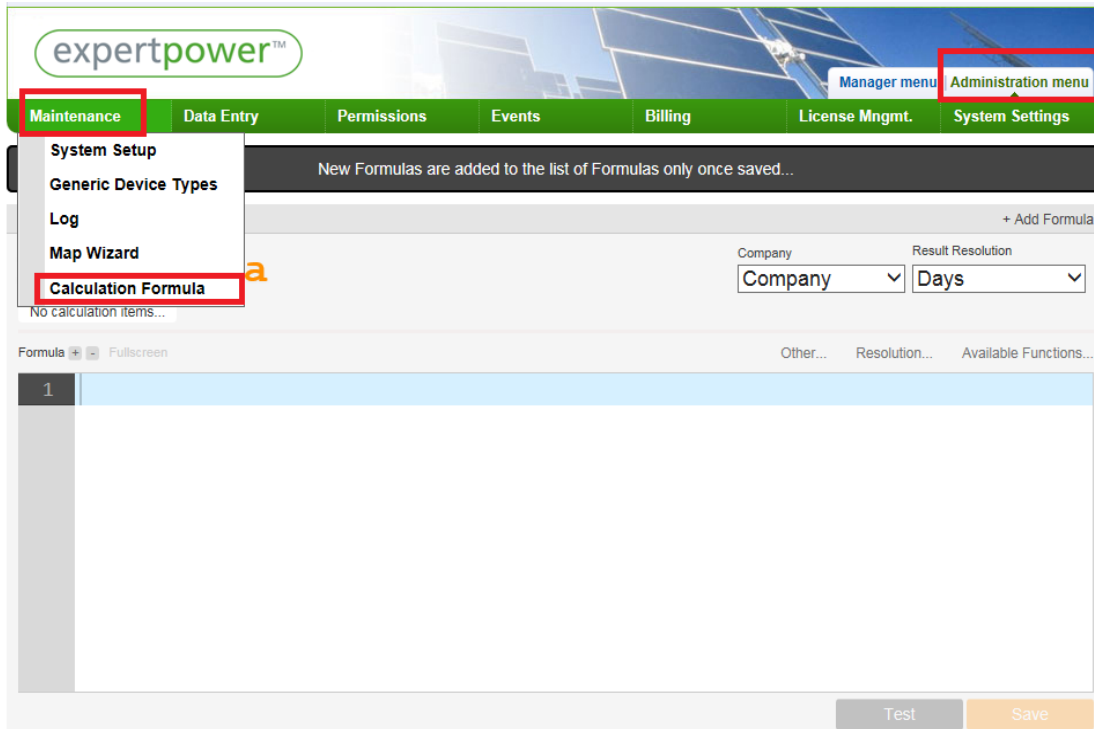


# Calculation formula

Administration Menu > Maintenance > Calculation Formula

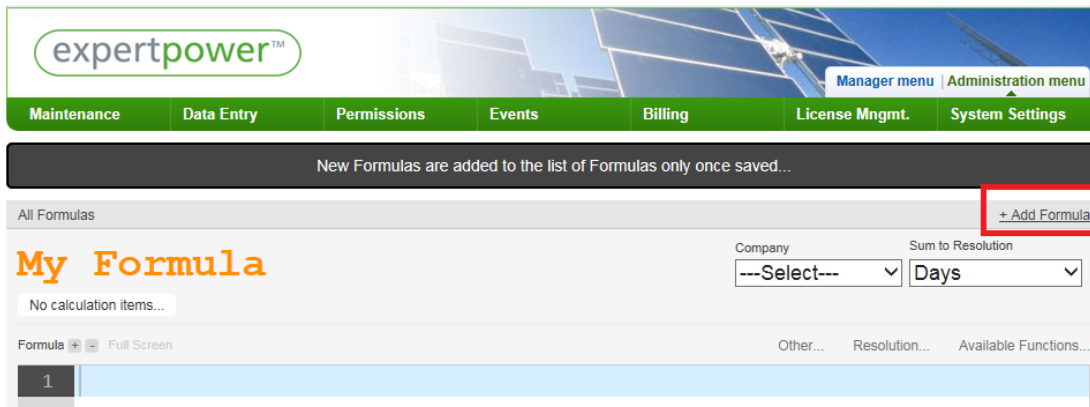
ExpertPower 5.0 presents a new module - a calculation formula engine. The motivation is to consolidate all the required formula definitions in a single location. A formula represents a set of one or more conditions. The conditions are written in a script like supported language, as explained below. The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



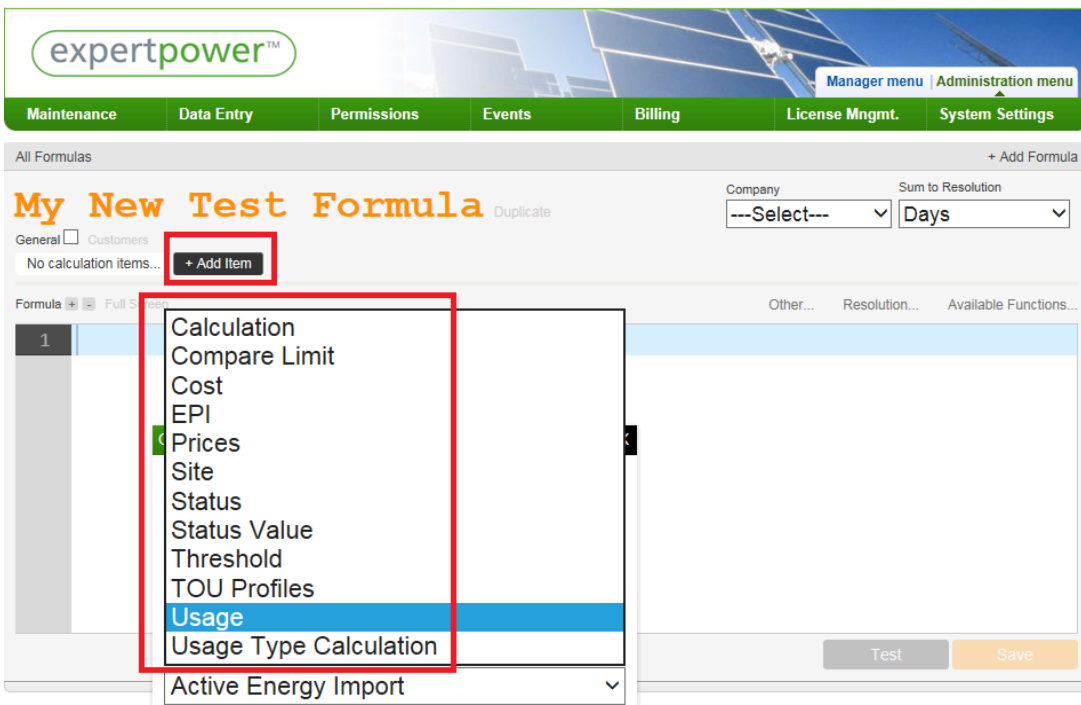
## 1. Enter a formula name and click on Save

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.

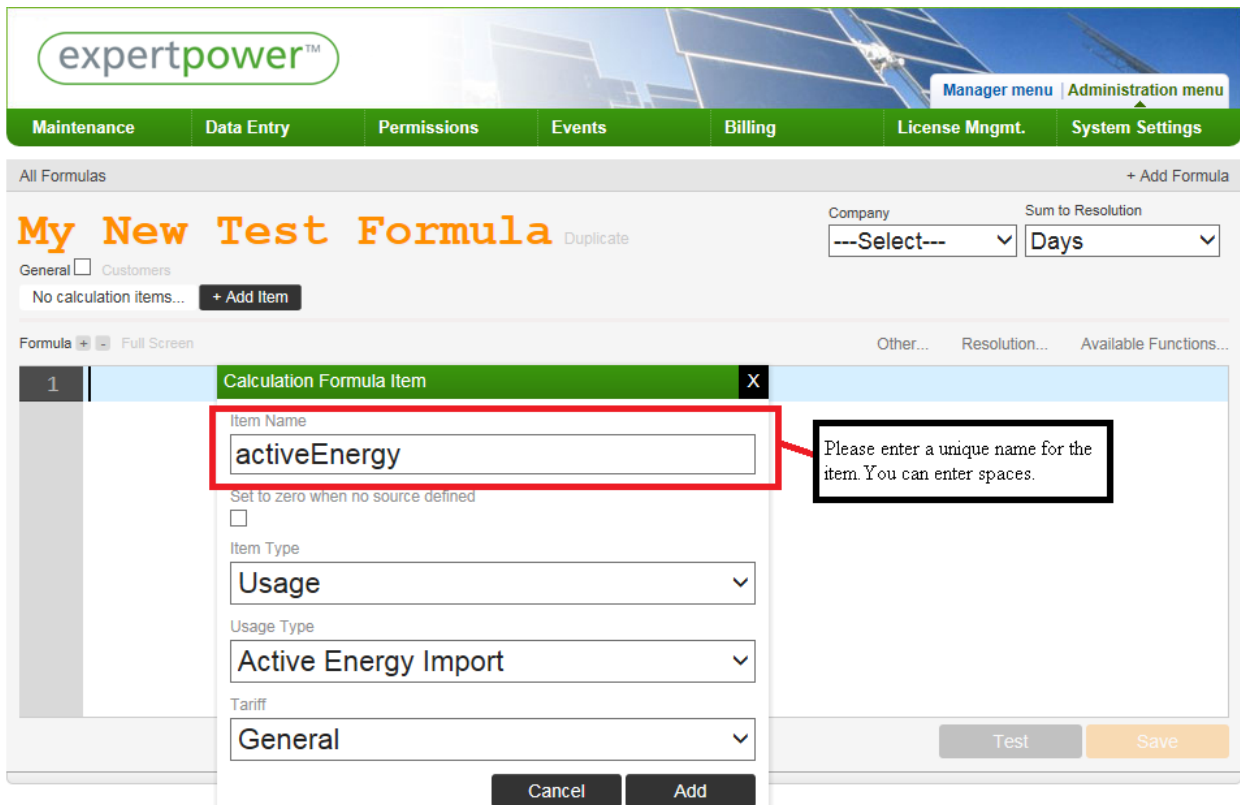


*A. Clicking on Add Item opens a window:*



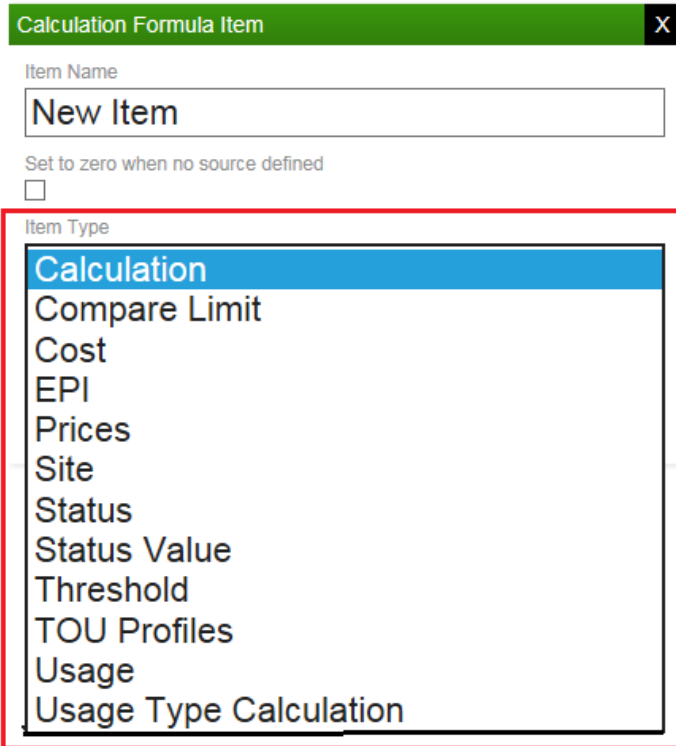
*Enter an Item Name:*

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:



Calculation Formula Item X

Item Name  
New Item

Set to zero when no source defined

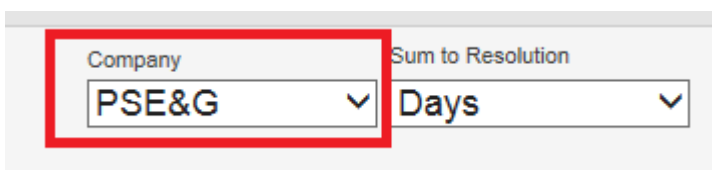
Item Type

- Calculation
- Compare Limit
- Cost
- EPI
- Prices
- Site
- Status
- Status Value
- Threshold
- TOU Profiles
- Usage
- Usage Type Calculation

**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



Company Sum to Resolution

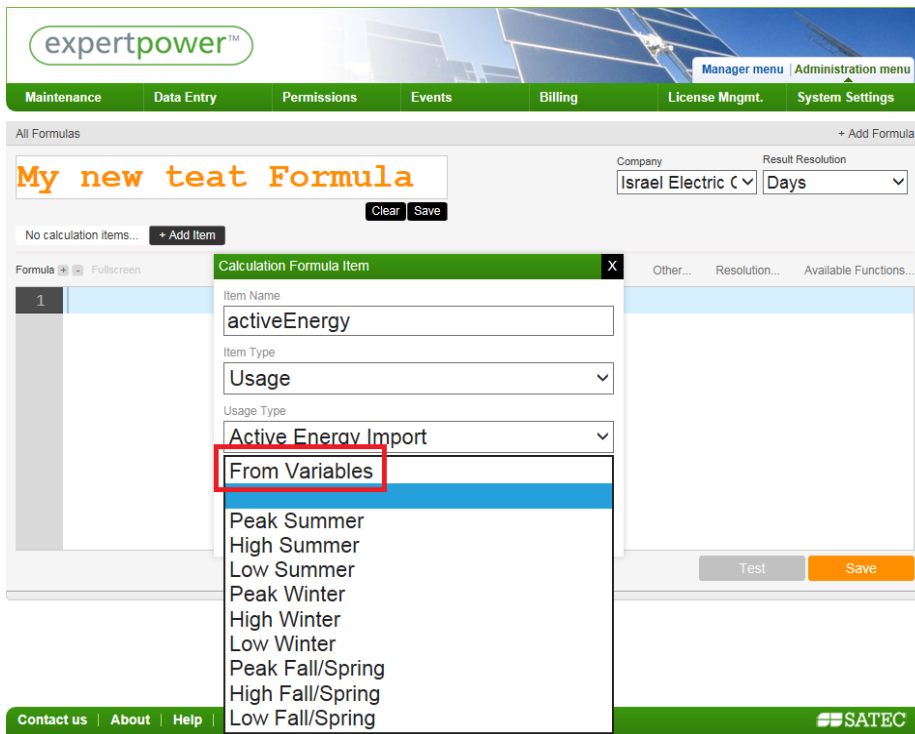
PSE&G Days

**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.

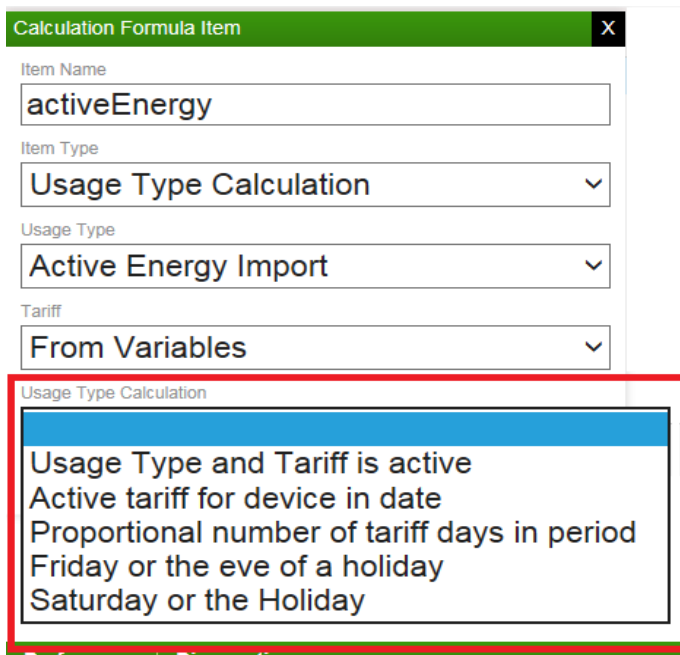
**Active tariff for device in date:** Summarizes the number of times the tariff is active for the device in date.

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



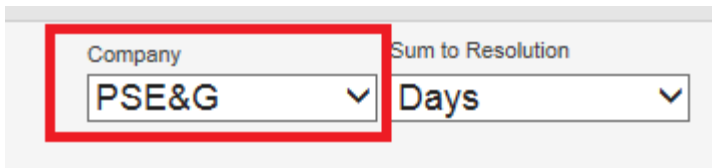
**Friday or the eve of holiday:** Summarizes the energy on Fridays and holiday eves when the tariff is special

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



**3. Threshold** - Threshold from the available thresholds list.

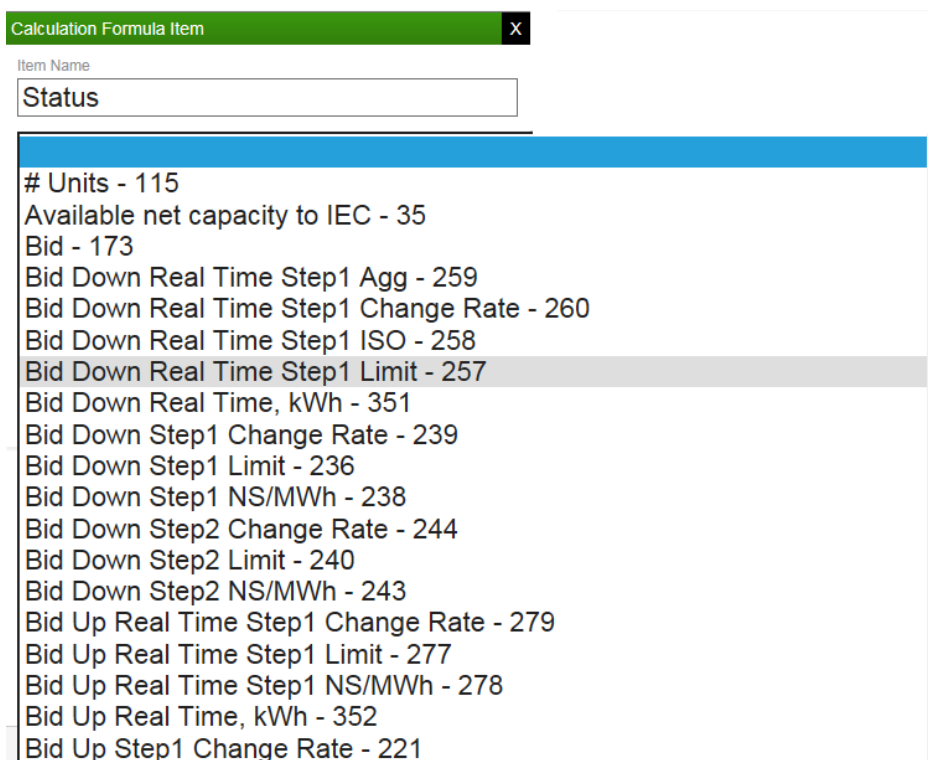
*Please note:* The threshold list is presented, once you set up the relevant Electric Company.



Company  
PSE&G

Sum to Resolution  
Days

**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.

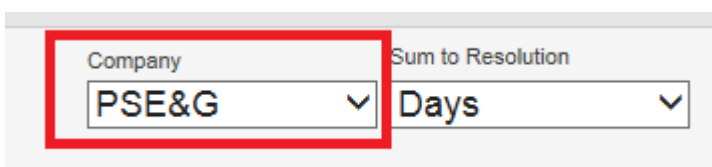


Calculation Formula Item

Item Name  
Status

- # Units - 115
- Available net capacity to IEC - 35
- Bid - 173
- Bid Down Real Time Step1 Agg - 259
- Bid Down Real Time Step1 Change Rate - 260
- Bid Down Real Time Step1 ISO - 258
- Bid Down Real Time Step1 Limit - 257
- Bid Down Real Time, kWh - 351
- Bid Down Step1 Change Rate - 239
- Bid Down Step1 Limit - 236
- Bid Down Step1 NS/MWh - 238
- Bid Down Step2 Change Rate - 244
- Bid Down Step2 Limit - 240
- Bid Down Step2 NS/MWh - 243
- Bid Up Real Time Step1 Change Rate - 279
- Bid Up Real Time Step1 Limit - 277
- Bid Up Real Time Step1 NS/MWh - 278
- Bid Up Real Time, kWh - 352
- Bid Up Step1 Change Rate - 221

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



Company  
PSE&G

Sum to Resolution  
Days

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.

The screenshot shows a dialog box titled "Calculation Formula Item" with a close button (X) in the top right corner. The form contains the following fields:

- Item Name:** A text input field containing "Status".
- Set to zero when no source defined:** A checkbox that is currently unchecked.
- Item Type:** A dropdown menu with "Status Value" selected. This field is highlighted with a red border.
- Source:** A dropdown menu with "Billing" selected.
- Status:** A dropdown menu with "Production Limitation Type - 312" selected.
- Value:** A list box containing the following items: "Acceptance Tests", "Change Frequency", "Dispatcher Order", "Force Majeure", "Grid Failure", "INGL Error", "No Limitation", "Planned Outage", "Responsibility", and "Unscheduled Outage". This list box is also highlighted with a red border.

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 transformed to 50. A value between 10 and 30 will be transformed to  $(50 + (100 - 50) * (\text{value} - 10) / (30 - 10))$

The screenshot shows a dialog box titled "Calculation Formula Item" with a close button (X) in the top right corner. The form contains the following fields:

- Item Name:** A text input field containing "New Item".
- Set to zero when no source defined:** A checkbox that is currently unchecked.
- Item Type:** A dropdown menu with "Compare Limit" selected.
- Compare Limit:** A dropdown menu with "Temperature Coefficient cycle open / closed" selected.

At the bottom of the dialog box, there are two buttons: "Cancel" and "Add".

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.

Calculation Formula Item

Item Name  
calculation

Set to zero when no source defined

Item Type  
Calculation

Calculation  
Daniel for accumulation - 68

Cancel Add

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

Company  
PSE&G

Sum to Resolution  
Days



+ Add Formula

Company: **PSE&G** Sum to Resolution: **Days**

**Calculation Formula Item** [X]

Item Name: **activeEnergy**

Set to zero when no source defined:

Item Type: **TOU Profiles**

Usage Type: **Active Energy Import**

TOU Profiles:

- Working Days Summer
- Sat,Sun Summer
- Working Days Winter
- Sat,Sun Winter

Billing \ Administration \ Companies \ TOU Profiles



Show TOU Calendar

+ Add New Definition

Details	Season	Tariff	TOU Profiles	Price Lists	Calculation	Thresholds	Factors	Payment Programs
Company: <b>PSE&amp;G</b>				Usage Type: <b>Active Energy Import</b>				
ID	Name		Season			Action		
1	Working Days Summer		Summer			Hours   Days Edit		
2	Sat,Sun Summer		Summer			Hours   Days Edit		
3	Working Days Winter		Winter			Hours   Days Edit		
4	Sat,Sun Winter		Winter			Hours   Days Edit		
* TOU Profile can not be deleted if Hours / Days defined								

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

Company: **PSE&G** Sum to Resolution: **Days**

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

Calculation Formula Item
✕

Item Name

Set to zero when no source defined

Item Type

Price

Items

Cancel
Add

Billing \ Administration \ Companies \ Price Lists

↓
🖨️
+ Add New Definition

Details	Season	Tariff	TOU Profiles	Price Lists	Calculation	Thresholds	Factors	Payment Programs
Company: PSE&G								
ID	Name						Items   Prices   Current Prices	Action
138	price list							Edit
* Price List can not be deleted if Items / Prices defined								

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

Calculation Formula Item
✕

Item Name

Set to zero when no source defined

Hourly Production

Heating Degree Days

Cooling Degree Days

Total Area

Temperature

Number of Rooms

Number of Computers

Weekly Hours of Occupancy

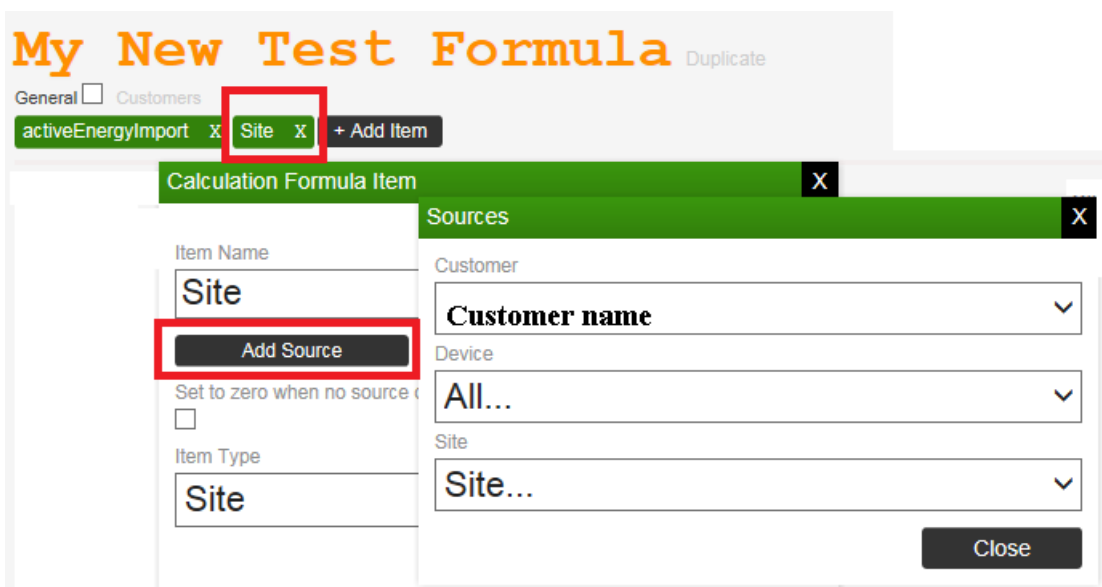
**11. Site** – Selecting a site. The site can then be used to sum data for all the devices in the site.

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":

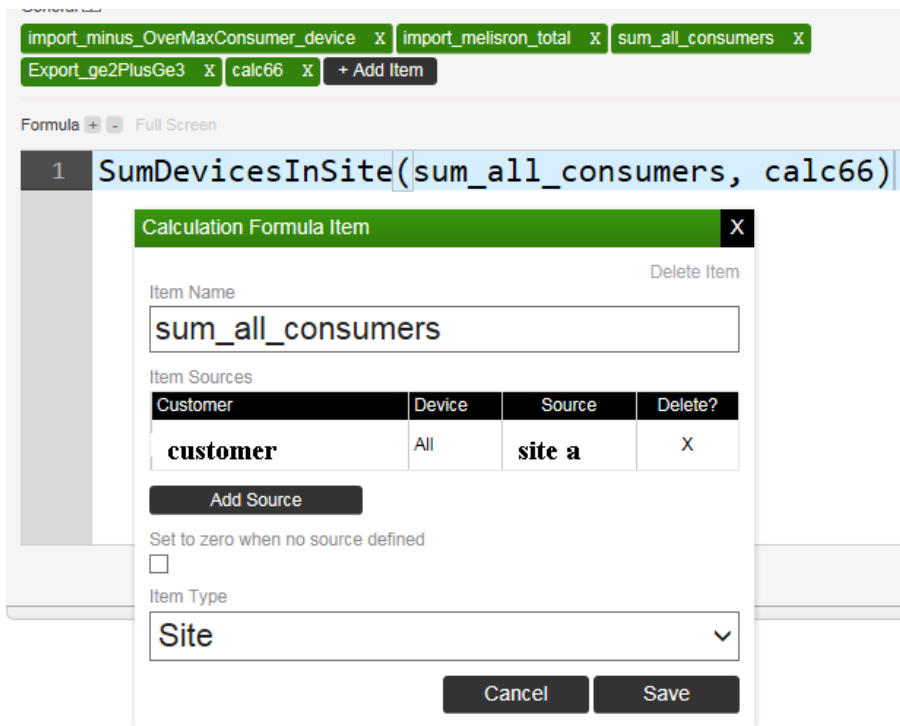


**Steps to set a data source for site item:**

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

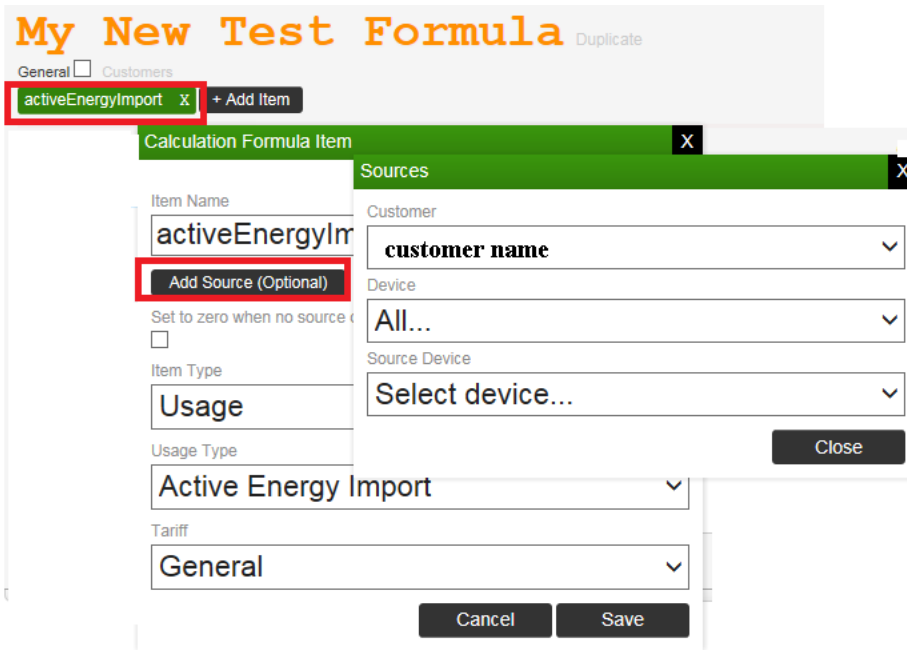
Because the formulas are general formulas and can be used for different customers and different devices, the source of the data can be set for each customer / device.

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.

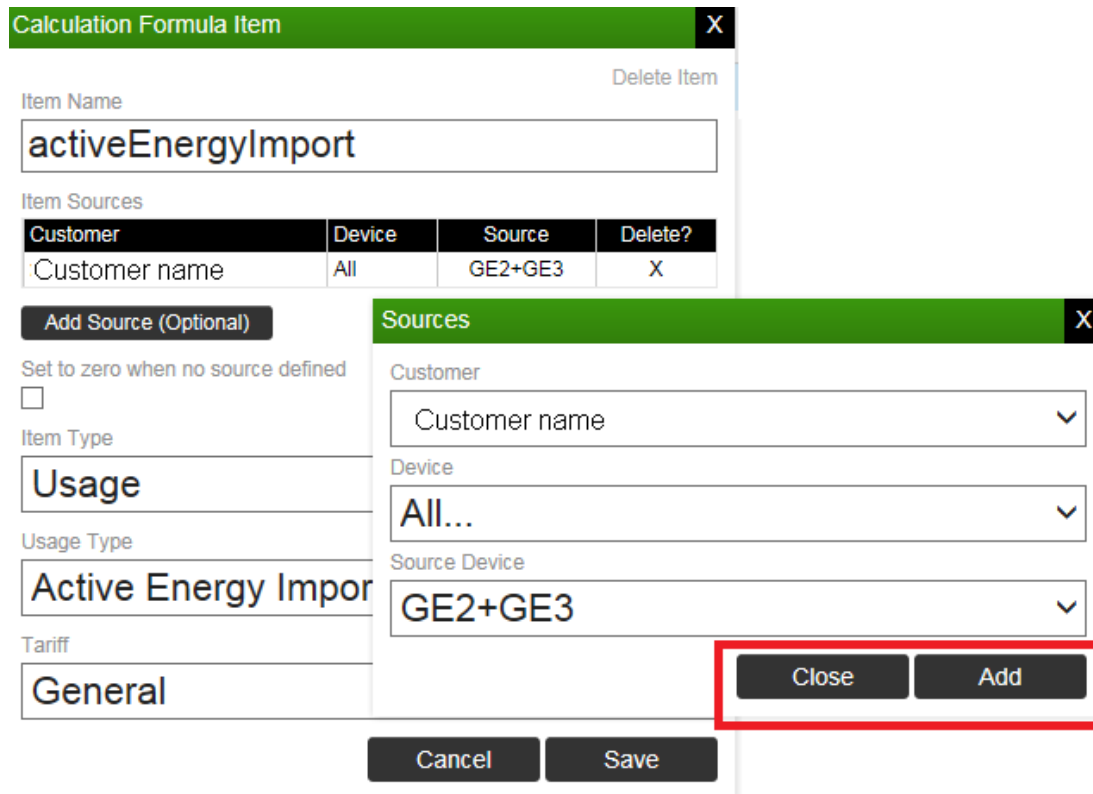
### Steps to set a data source:

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.

Calculation Formula Item [X]

Delete Item

Item Name  
activeEnergyImport

Add Source (Optional)

Set to zero when no source defined

Item Type  
Usage

Usage Type  
Active Energy Import

Tariff  
General

Cancel Save

### 3. The construction of the formula

Building formula is done using the following window:

expertpower™

Manager menu Administration menu

Maintenance Data Entry Permissions Events Billing License Mngmt. System Settings

All Formulas + Add Formula

My new test Formula

Company: Israel Electric C Result Resolution: Days

Clear Save

Site x + Add Item

Formula Fullscreen Other... Resolution... Available Functions...

1

Test Save

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 sumclsc66

```
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)



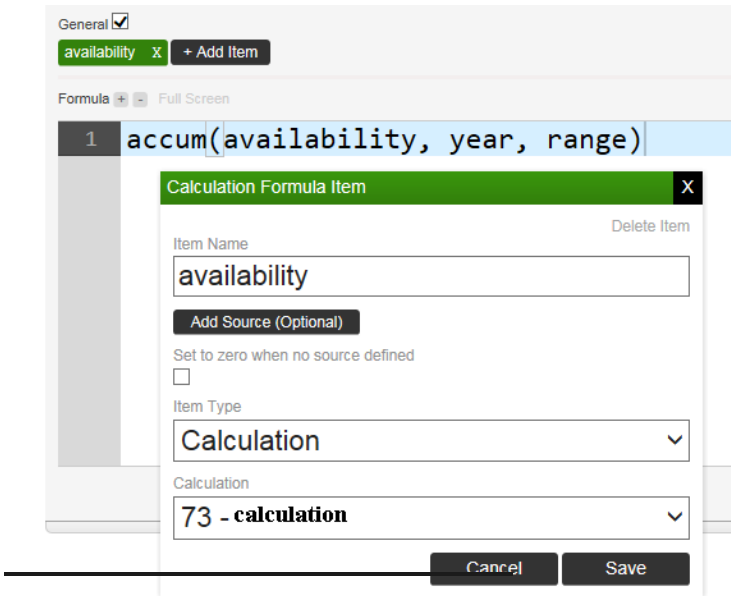
## Resolution:

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)`

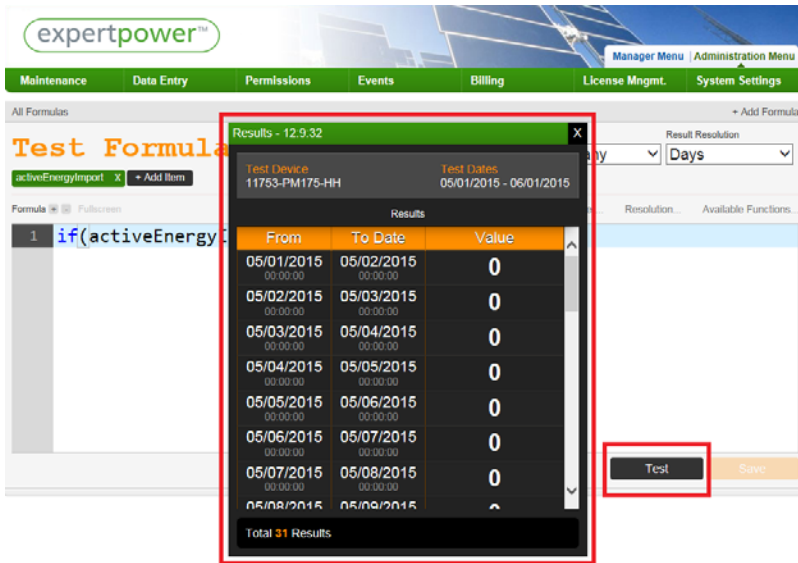
#### 4. After creating the formula, click Save



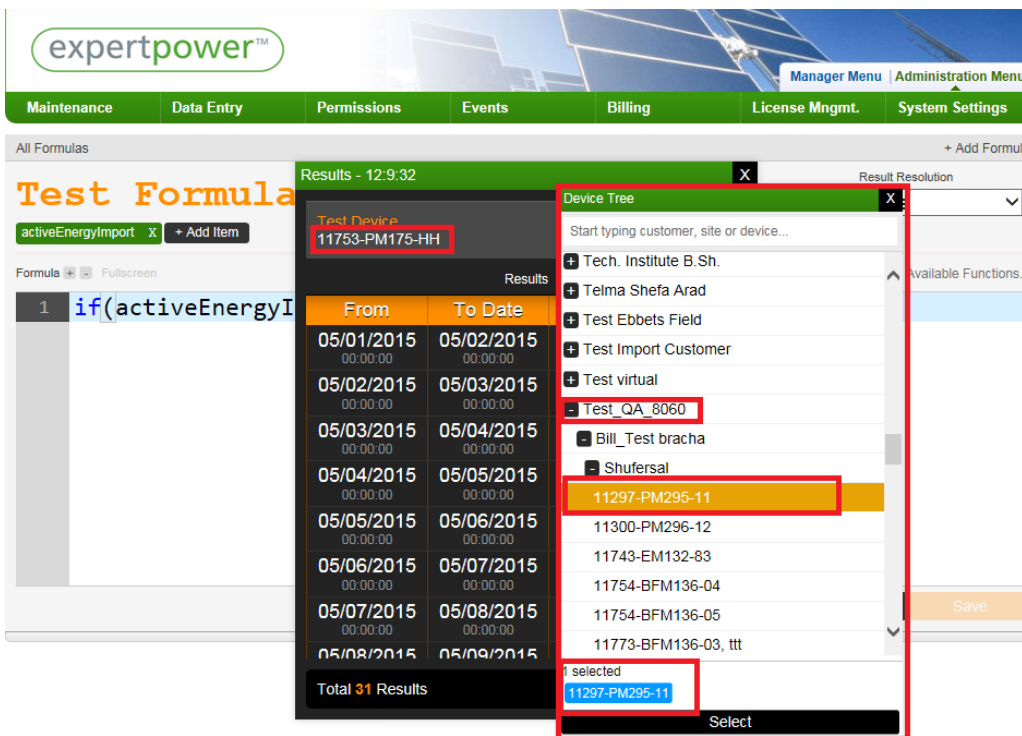
After saving, the “Test” button is enabled. This serves as a test tool to see the formula results in action.

## 5. Test

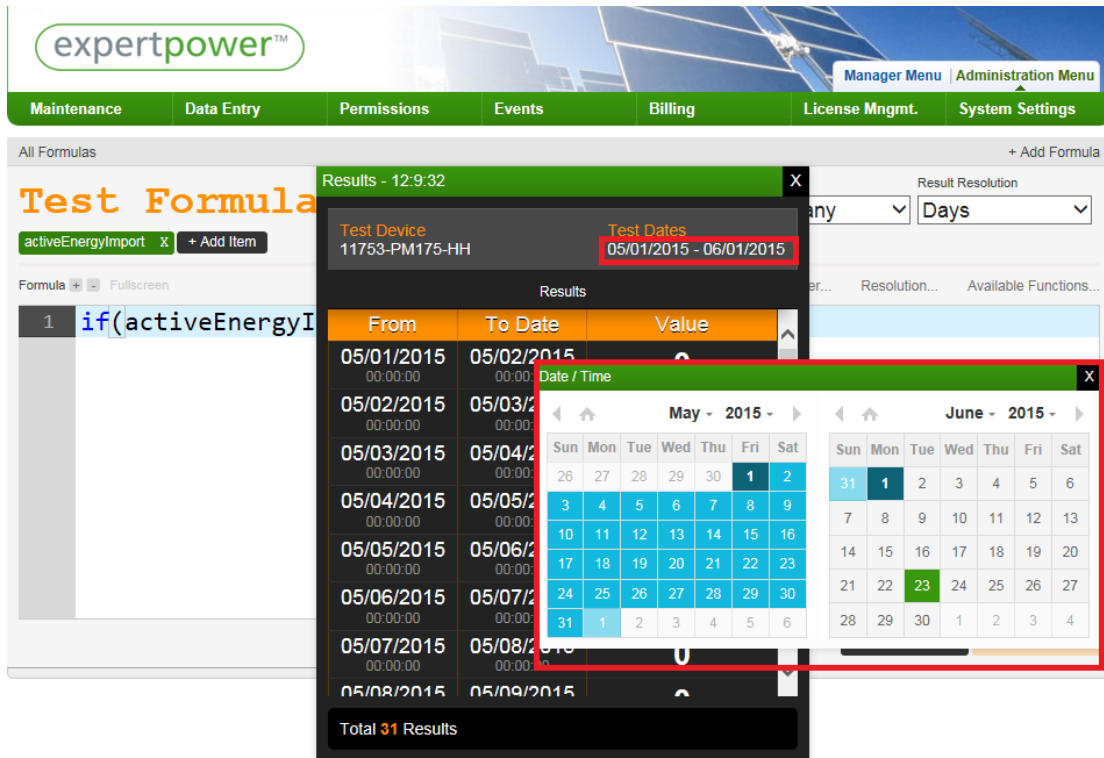
Clicking on testing opens the results window



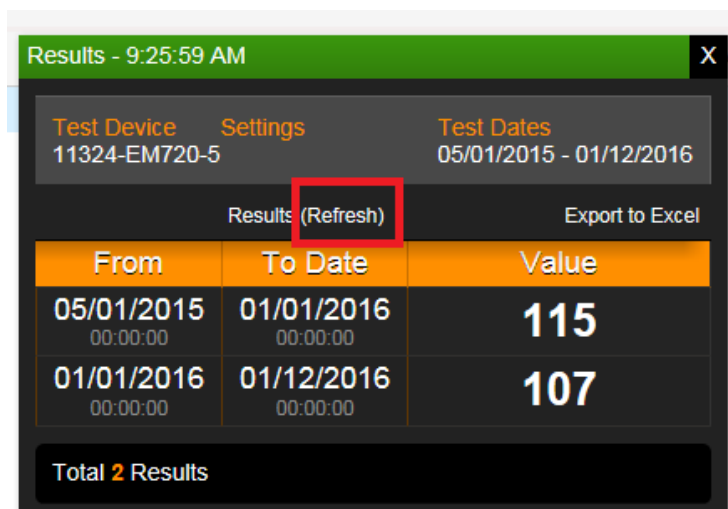
Clicking on the name of the device opens a window that allows changing the tested device. Choosing a new device, and pressing the "Select" changes the selected device and the results are updated accordingly:



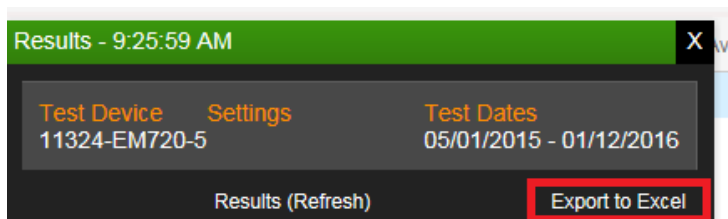
Clicking on the “Test Dates” allows changing the tested date period:



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



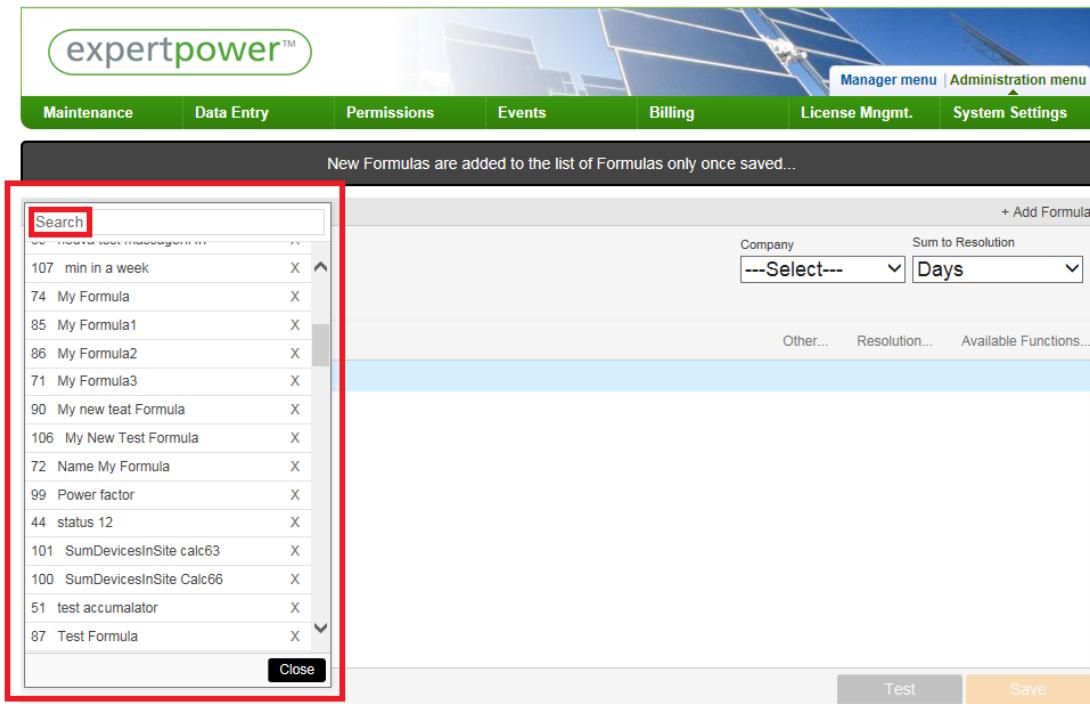
You can export the results of the Test Excel file



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.



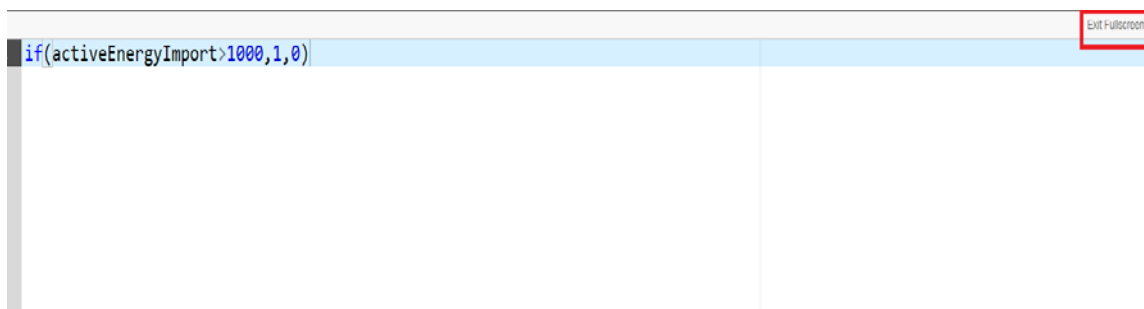
## Full Screen

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



The screenshot shows the ExpertPower software interface. At the top, there is a navigation bar with the ExpertPower logo and several menu items: Maintenance, Data Entry, Permissions, Events, Billing, License Mngmt., and System Settings. Below this, there is a header for 'All Formulas' with a '+ Add Formula' button. The main area is titled 'Test Formula' and contains a 'Duplicate' button, a 'Company' dropdown menu set to 'Company', and a 'Result Resolution' dropdown menu set to 'Days'. Below these, there is a 'Formula' dropdown menu with 'Fullscreen' selected and highlighted by a red box. The formula editor shows the formula `if(activeEnergyImport>1000,1,0)` on line 1. At the bottom right, there are 'Test' and 'Save' buttons.

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



The screenshot shows the ExpertPower software interface in normal screen mode. The formula editor shows the formula `if(activeEnergyImport>1000,1,0)` on line 1. At the top right of the formula editor, there is an 'Exit Fullscreen' button highlighted by a red box.