Expert Power Pro

Operation Manual

Table of Contents

1 Introduction

Expert Power Pro is used for monitoring the electricity consumption and the electric bills from the electric grid it is connected to.

Safety Instructions

Refer to Satec general safety instructions.

Safety Conventions

Note
Notes contain additional important information.

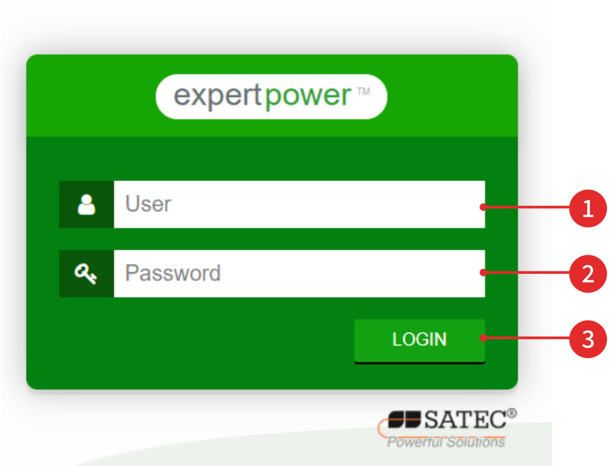
Tip
Tips contain helpful information.

Warning
Warnings contain important hazard information.

2 System Operation

Logging into the System

1. Enter the web address http://www.expertpowerplus.com or the local server address in the browser address bar.
2. Type the username (1).
3. Type the password (2).
4. Click LOGIN (3).



Tip
For better web performance, use Internet Explorer or Firefox.

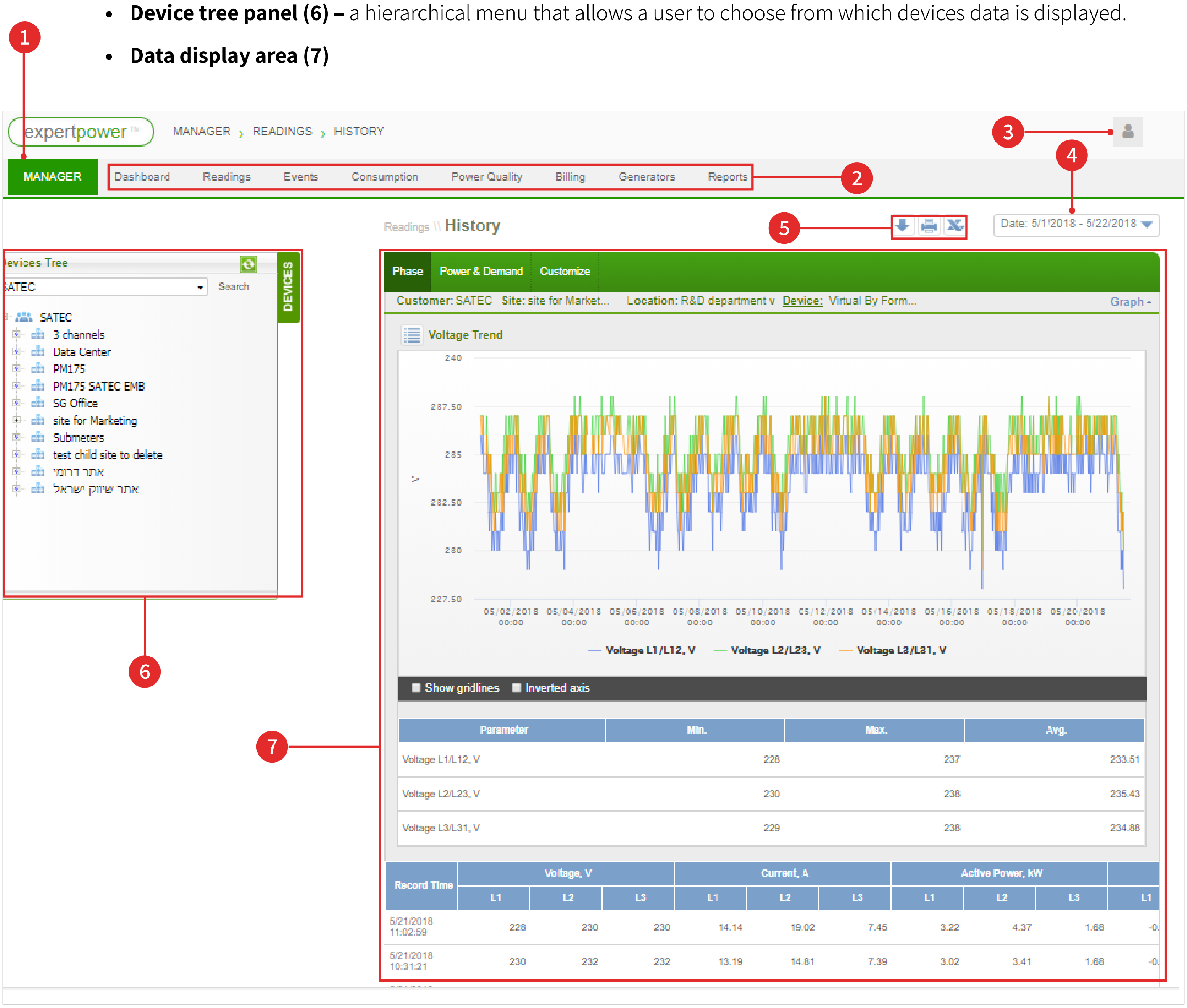
Note
The system operates over a network. Make sure there is network connection at all times.

User Interface Overview

Once logged in, navigation is done using menus. The user interface includes the following elements:

> **Note**
> The dashboard user interface includes different elements and is detailed in the Dashboard User Interface section.

- **Manager level (1) –** the system operates on two user levels:
  - Manager – can view data and generate reports (see Manager Level Menus on page 8).
  - Administrator – has administrative privelages such as adding and canceling sites and devices (see Administrator Settings on page 34).
- **Menu bar (2) –** the displayed menus vary according to the user level.
- **Manager level selection button (3)**
- **Date range for data display (4) –** see Setting Data Range on page 6.
- **Toolbar (5) –** enables exporting to PDF and Excel formats and viewing of previously exported files.
- **Device tree panel (6) –** a hierarchical menu that allows a user to choose from which devices data is displayed.
- **Data display area (7)**

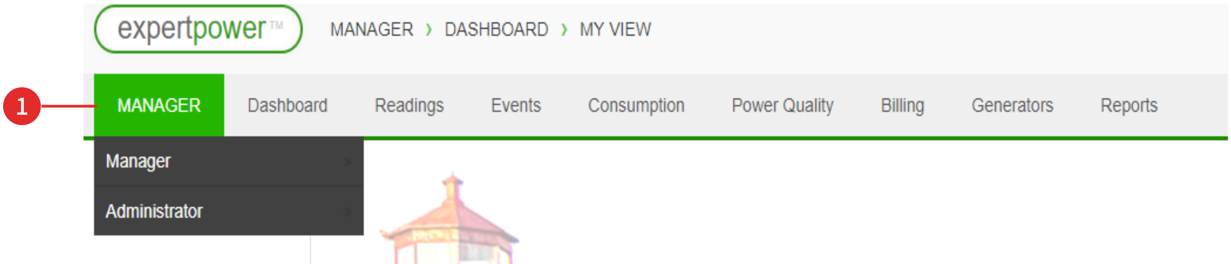


User Level Selection

There are two user levels in the system:

- **Manager –** a user who is granted manager access can see and track information and produce reports (see Manager Level Menus on page 8).
- **Administrator –** a user who is granted administrator access can define and set meters, users, calculations, and more (see Administrator Settings on page 34).

In order to select the user type, click on the current manager level and select the desired level (1).

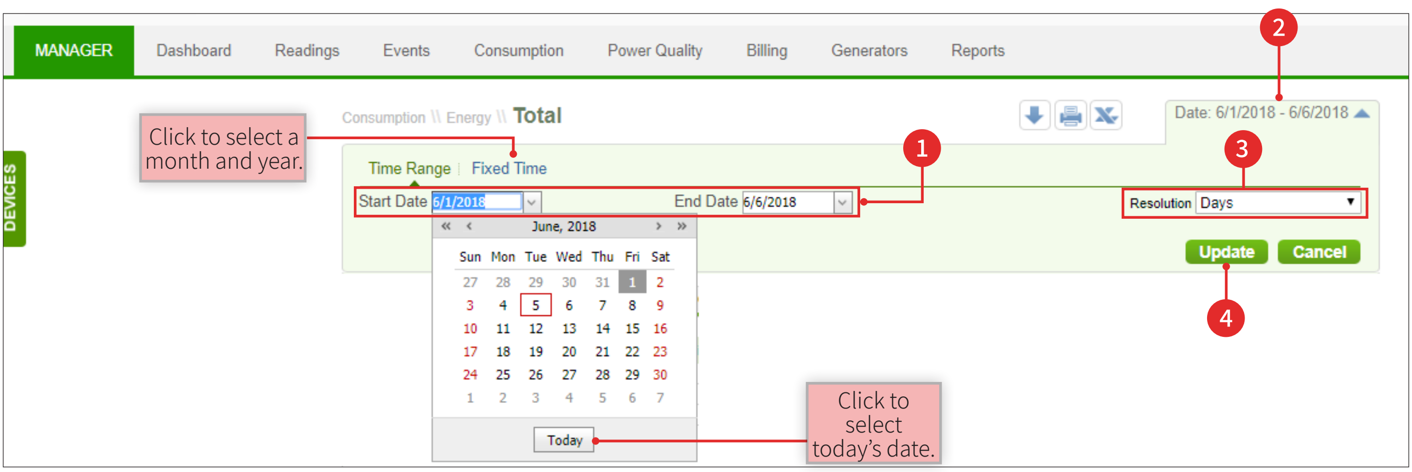


Setting Data Range

Data can be displayed by a specified date range.

To set the date range:

1. Click on the current date range (2). The data range panel opens.
2. Choose the resolution (3).
3. Choose the time range (1).
4. Click UPDATE (4) to affirm the selection.

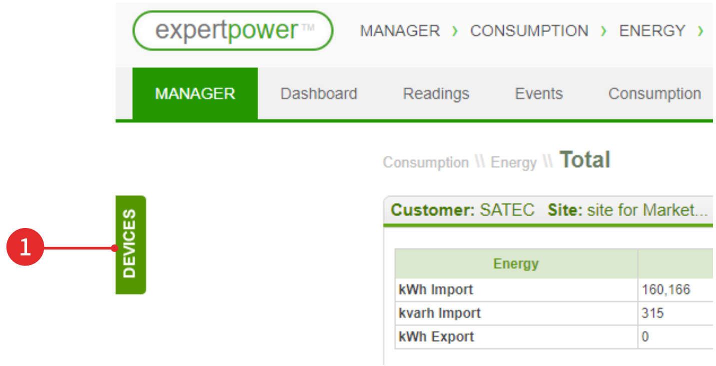


Selecting Devices

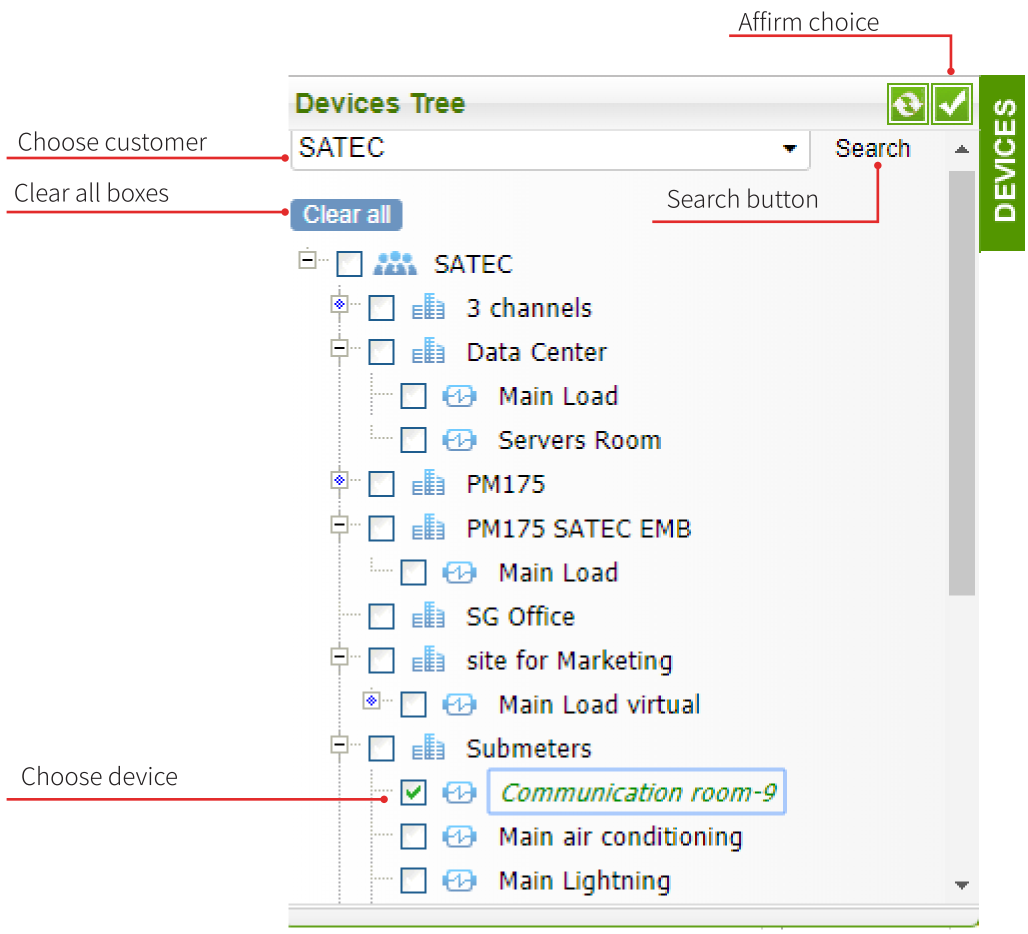
The Device Panel is a hierarchical menu for selecting one or more measuring devices for which data is displayed.

To select one or more devices:

1. Click DEVICES (1) to open the Device Panel.



2. Indicate the desired device(s) by checking the appropriate boxes.



Meaning of icons in the device tree:

Customer 

Counter Group 

Counter 

Communication Device 

3 Manager Level Menus

The manager level menus include the following options:

- Dashboard – display general data and define manager display settings.
- Readings – display device readings.
- Events – display system events and alerts.
- Consumption – display consumption data.
- Power Quality – display and analyze power quality events.
- Billing – generate bills and display past bills.
- Reports – create and generate reports.

Dashboard

The dashboard is a central display for monitoring the user's measurement devices. Pre-designed templates are provided that can be customized for user preference. The dashboard menu includes the following options:

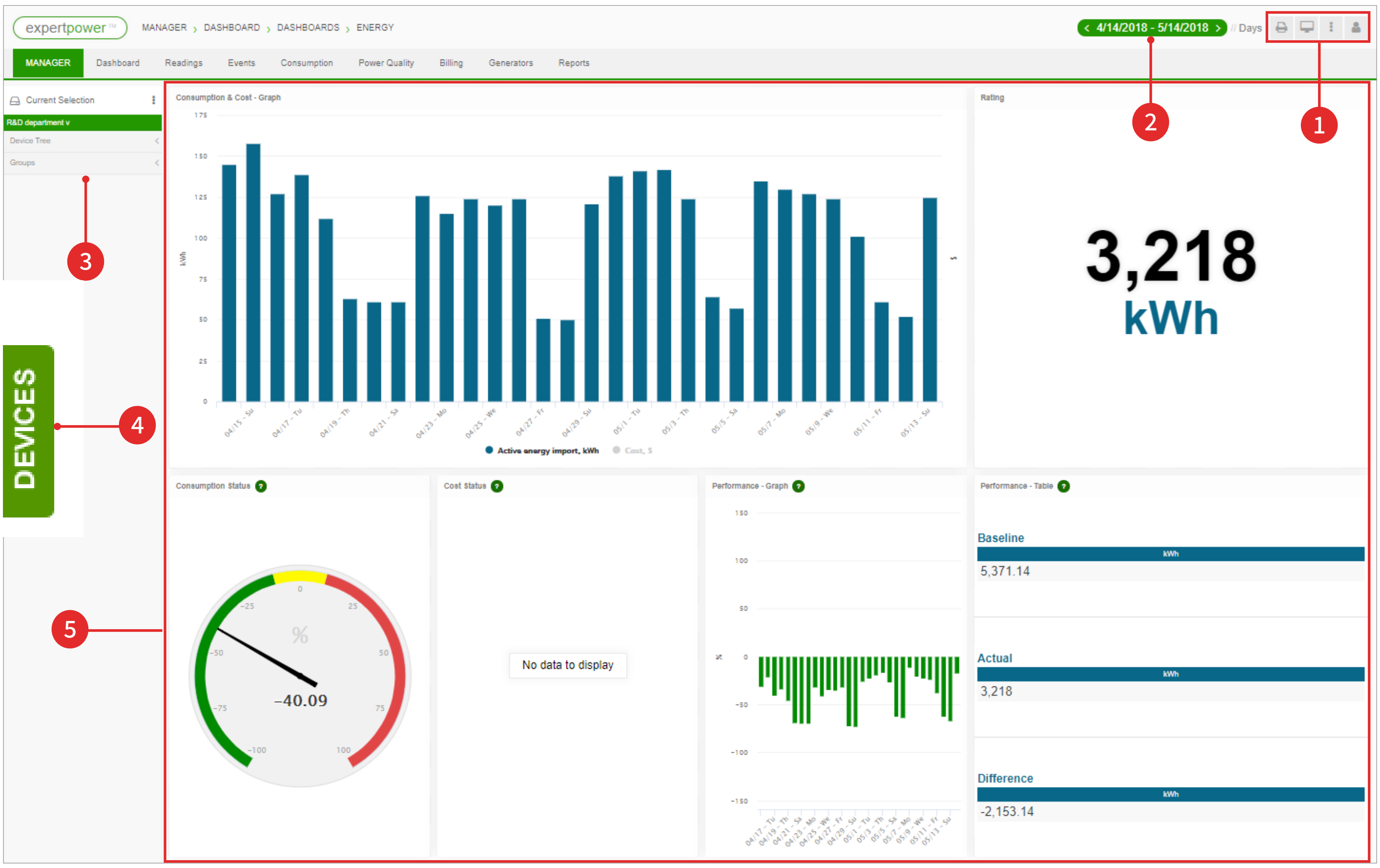
- My View
- Dashboards
- Analysis
- Geolocation
- My Dashboards

Dashboard User Interface

The dashboard user interface opens to the last group of devices selected. To select another group, expand the group area (3) and click the preferred group.

The areas in the main screen include:

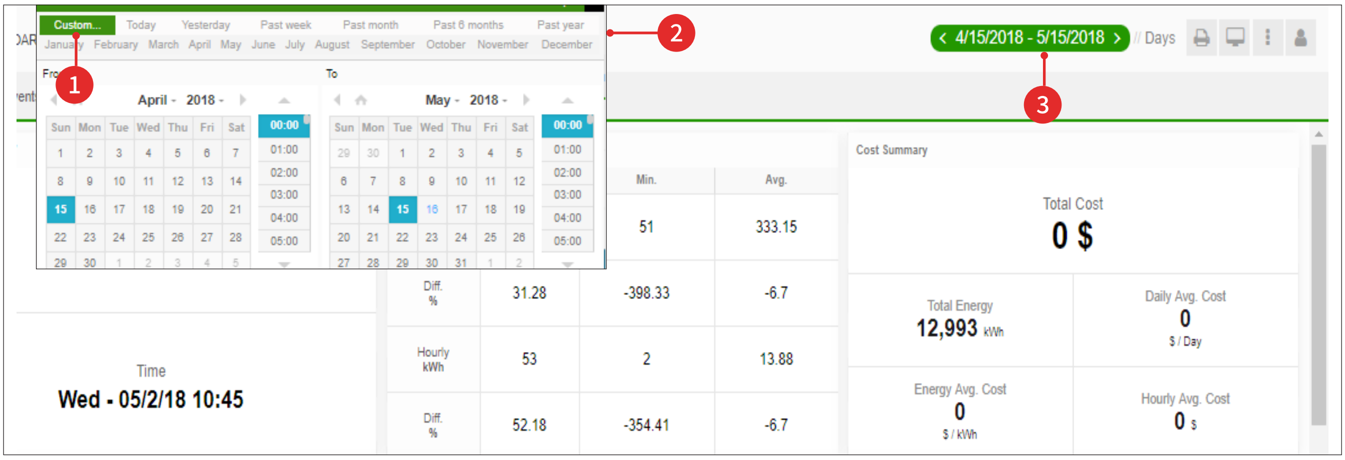
- **Toolbar (1) –** enables printing, choosing view modes, creating dashboards, and switching users.
- **Date range for data display (2) –** see Setting Display Data in the Dashboard on page 10.
- **Device Panel (4) –** a hierarchical menu for selecting one or more measuring devices for which data is displayed.
- **Data display area (5)**



Setting Display Data in the Dashboard

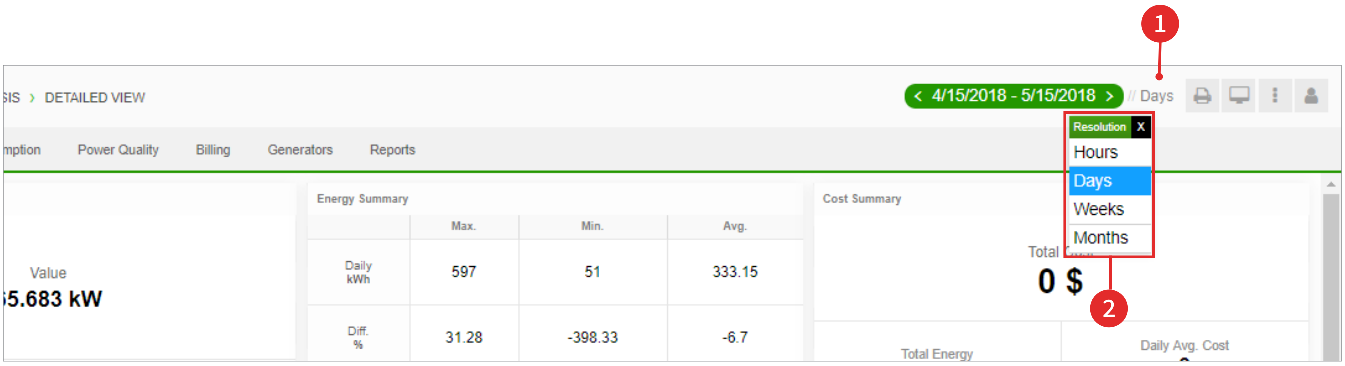
To define the date range in the dashboard menu screens:

1. Click on the current date range (3).
2. Choose from the suggested ranges (2), or click CUSTOM (1) to set a customized data range.



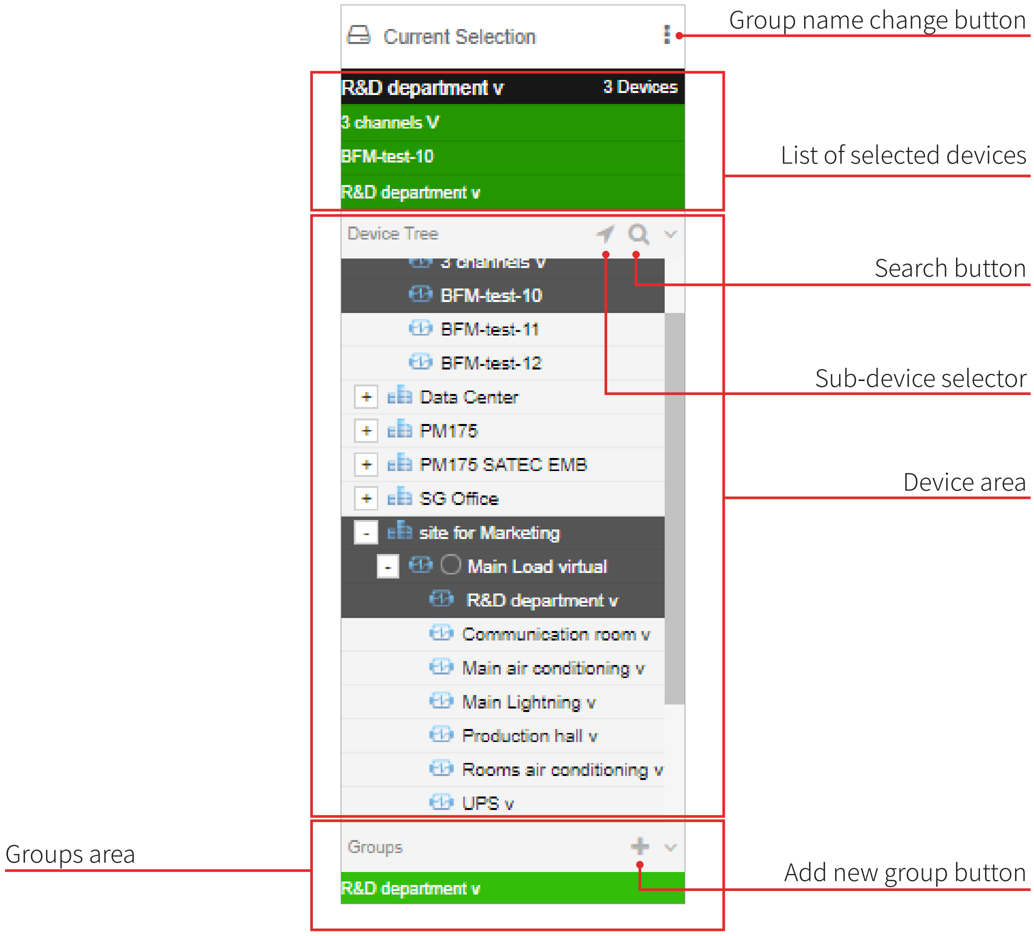
To set the data resolution

1. Click on the current resolution (1).
2. Choose from the resolution options (2).



Device Panel

The device panel in the dashboard menu includes:



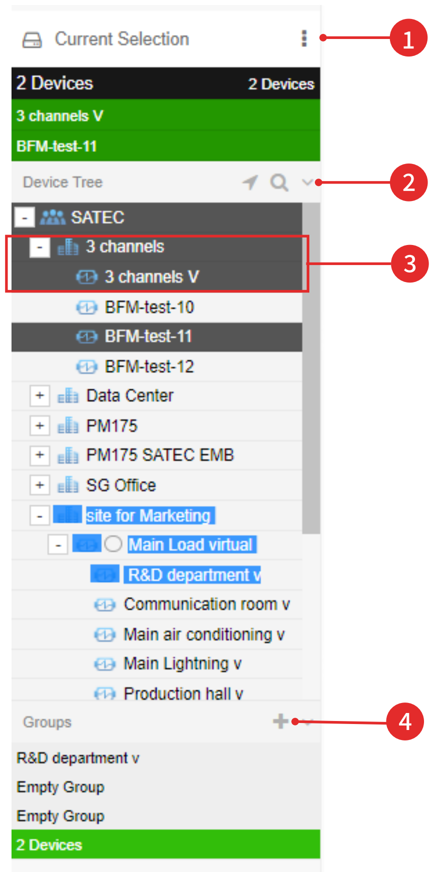
Add New Group

To add a new group:

1. Click + (4) in the groups panel to add a new group.
2. Expand (2) the device area and select one or more devices (3).

The selected devices appear in the upper area of the panel.

To change the group name, click on the **Group Name Change** button (1).



Tip

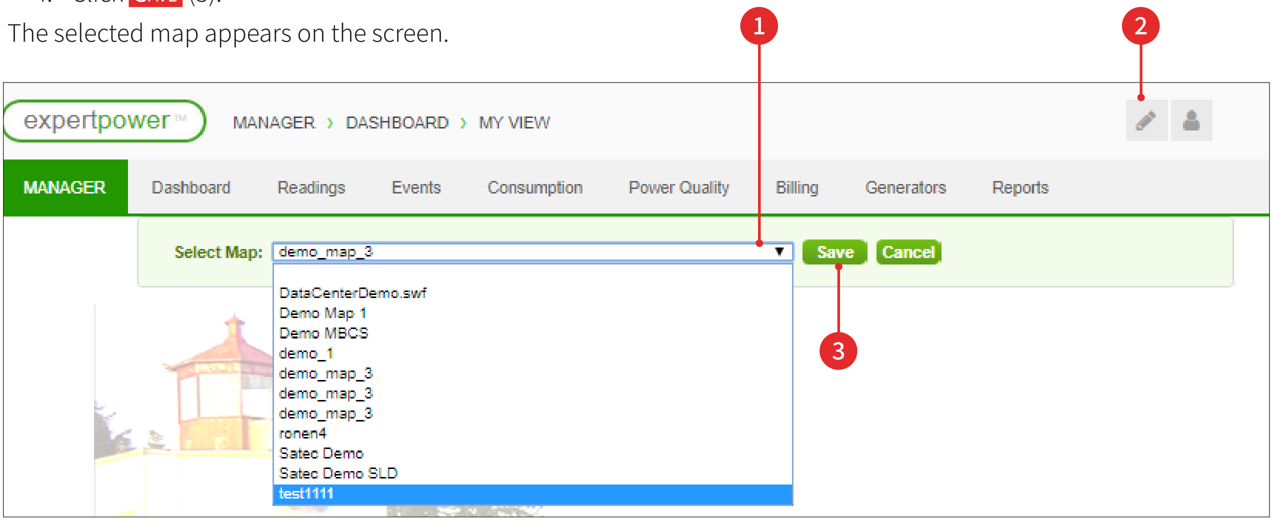
Any group or meter selection can be cancelled by clicking X displayed above it.

My View

In the My View screen the manager can customize the home screen view.

1. Select **My View** from the Dashboard menu.
2. Click the **Edit** icon (2).
3. Choose a map from the displayed options (1).
4. Click SAVE (3).

The selected map appears on the screen.



Readings

The Readings menu enables viewing of a device's meter readings, including:

- Last Reading
- History
- Max Demands
- Data Logs
- Live Data

Last Reading

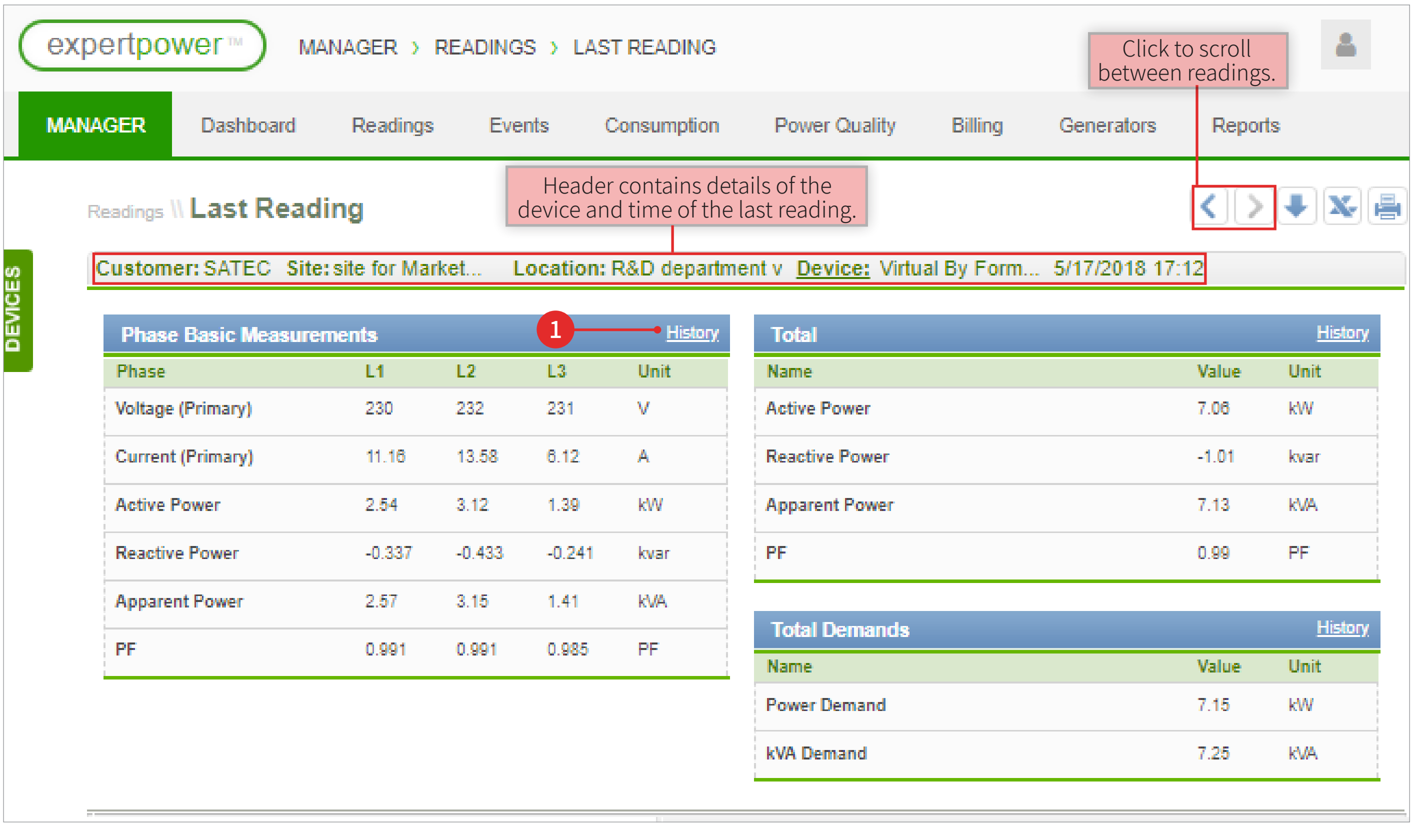
To display the last meter reading:

1. Select **Last Reading** from the Readings menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).

The last meter reading data for the selected device is displayed on the screen.

When selecting multiple devices, the Last Reading screen displays a table that coordinates the data of all selected devices. Each device in the table is a link to the last reading of that device.

To navigate to the History screen and view previous readings of a device, click **History** (1).



History

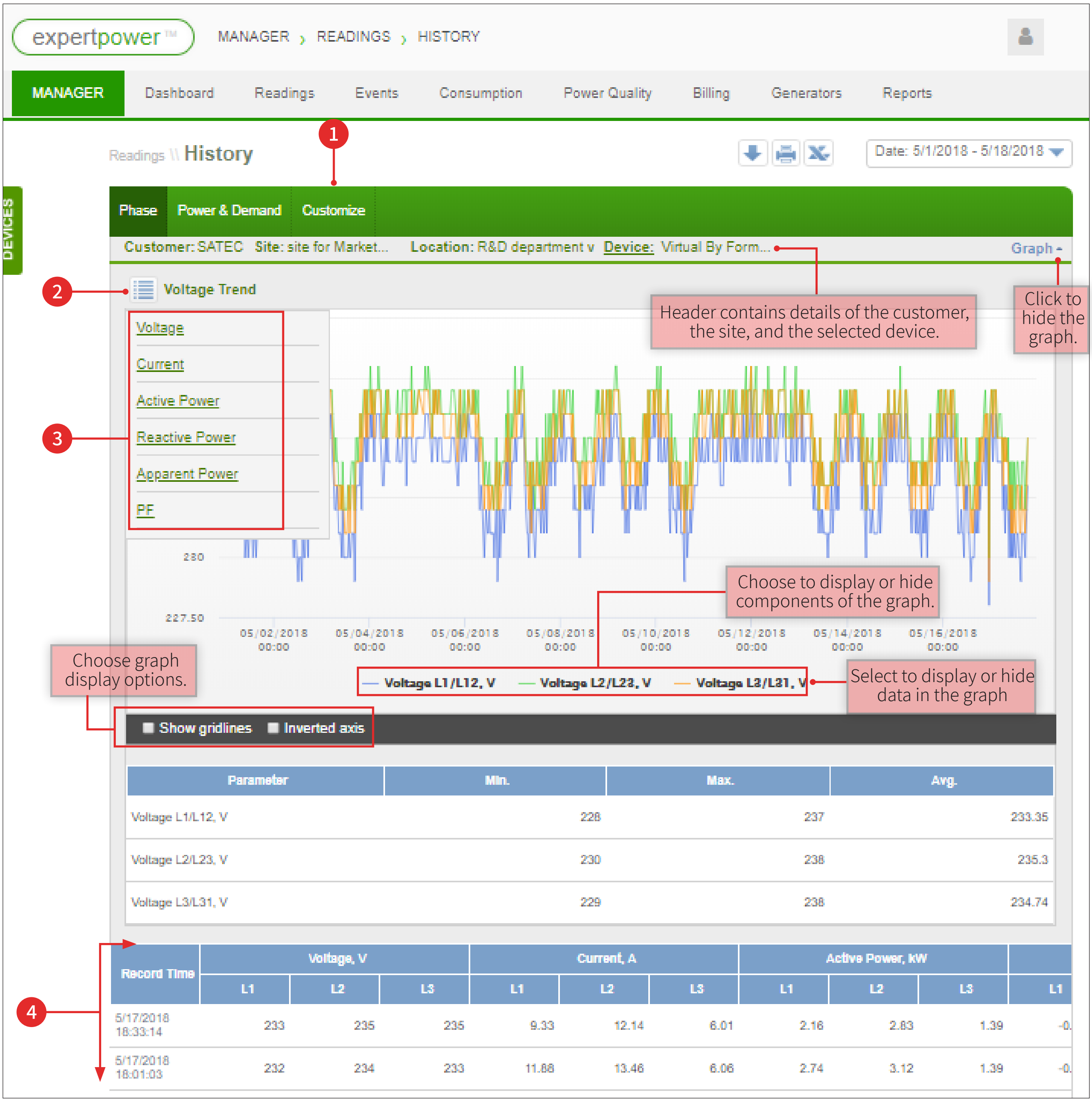
To display a history of device readings:

1. Select **History** from the Readings menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

The data history is displayed as a graph and a table (4).

To display a graph of a different type, click the **Graph Options** button (2) and choose the desired graph type from the displayed options (3).

4. Select the **Customize** tab (1) to set parameters for viewing the history screen.



Parameter	Min.	Max.	Avg.
Voltage L1/L12, V	228	237	233.35
Voltage L2/L23, V	230	238	235.3
Voltage L3/L31, V	229	238	234.74

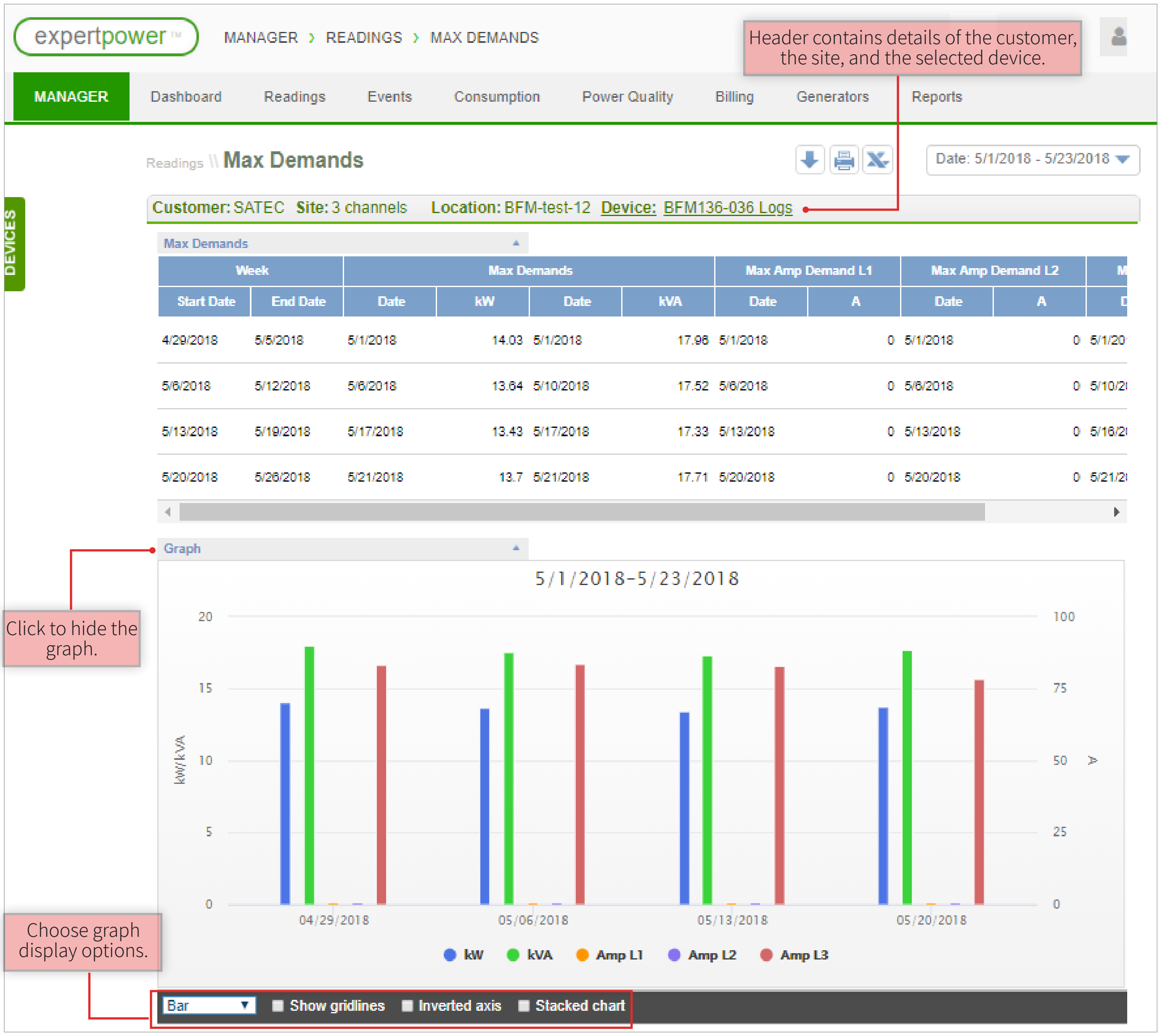
Record Time	Voltage, V			Current, A			Active Power, kW			
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1
5/17/2018 18:33:14	233	235	235	9.33	12.14	6.01	2.16	2.83	1.39	-0.
5/17/2018 18:01:03	232	234	233	11.88	13.46	6.06	2.74	3.12	1.39	-0.

Max Demands

To view peak data for a device or multiple devices:

1. Select **Max Demands** from the Readings menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

Peak data for the selected device(s) is displayed on the screen.

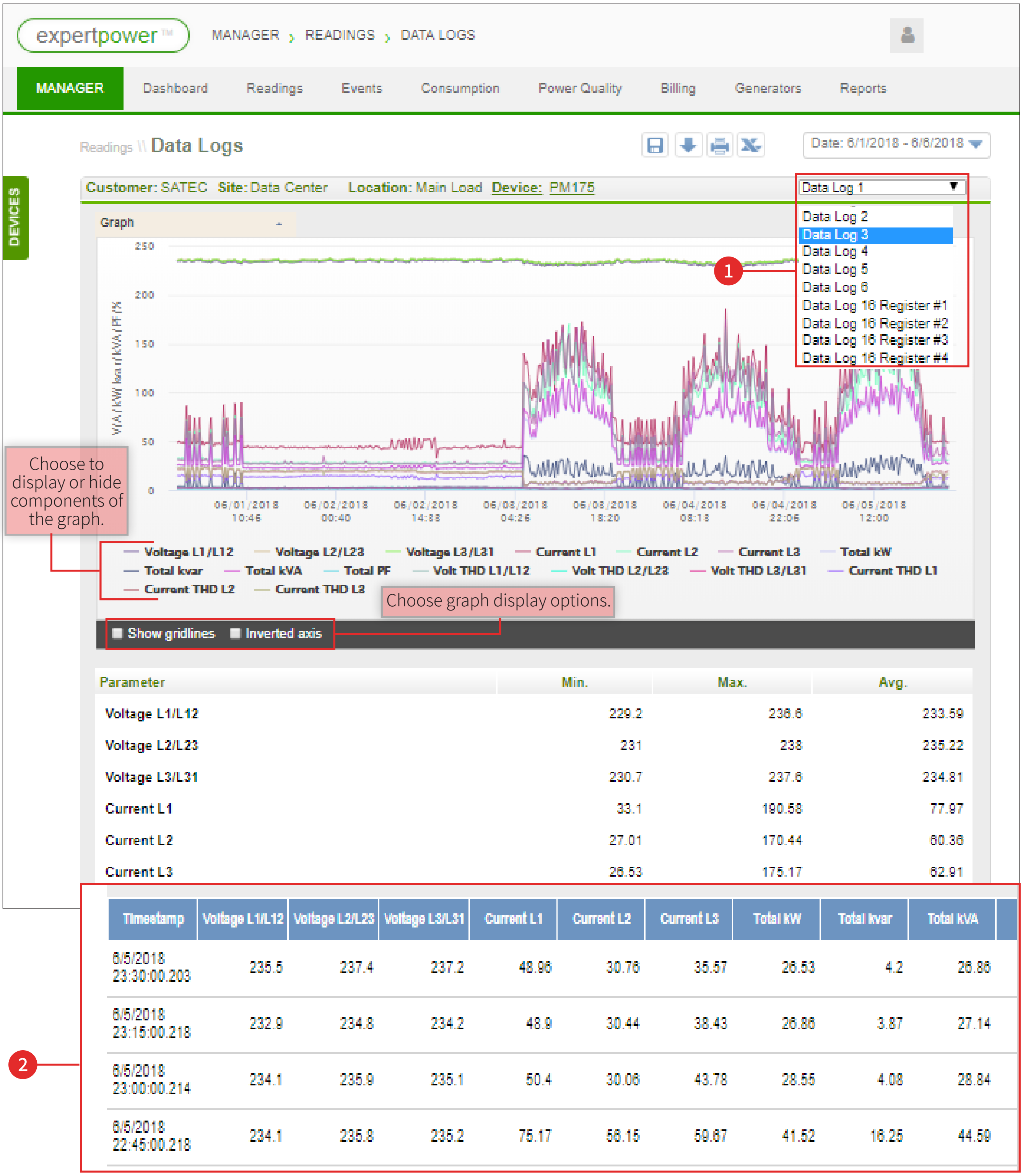


Data Logs

To display data that is stored in user device(s):

1. Select **Data Logs** from the Readings menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).
4. Choose a data log entry from the options in the drop-down menu (1).

The data stored on the memory of the selected device(s) appears in the form of graph, along with more detailed information at the bottom of the screen (2).



Live Data

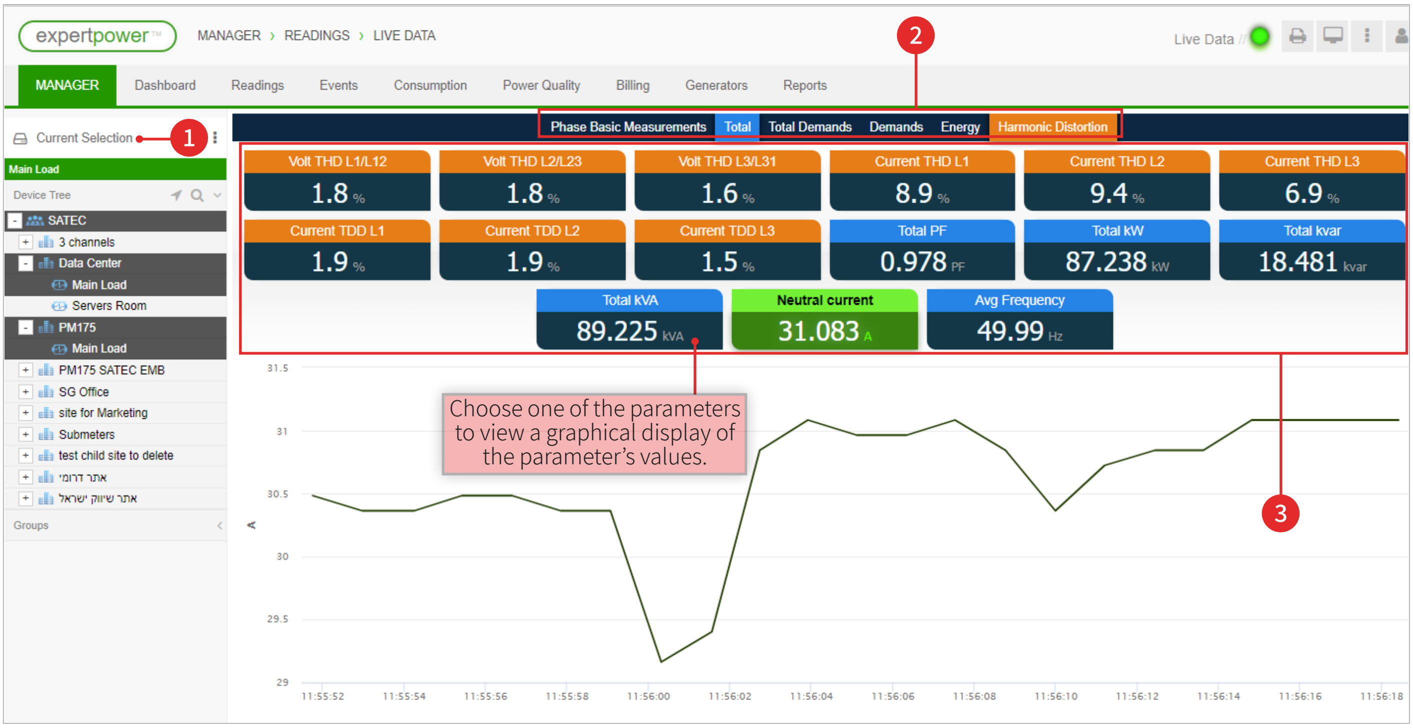
The real-time data feed provides current meter readings in the following categories:

- Phase Basic Measurements
- Total
- Total Demands
- Demands
- Energy
- Harmonic Distortion

To display meter readings in real time:

1. Select **Live Data** from the Readings menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7). The current device is displayed (1).
3. Choose one or more of the various meter categories to simultaneously display current readings (2).

The selected device data is displayed according to the selected parameters on the screen (3).

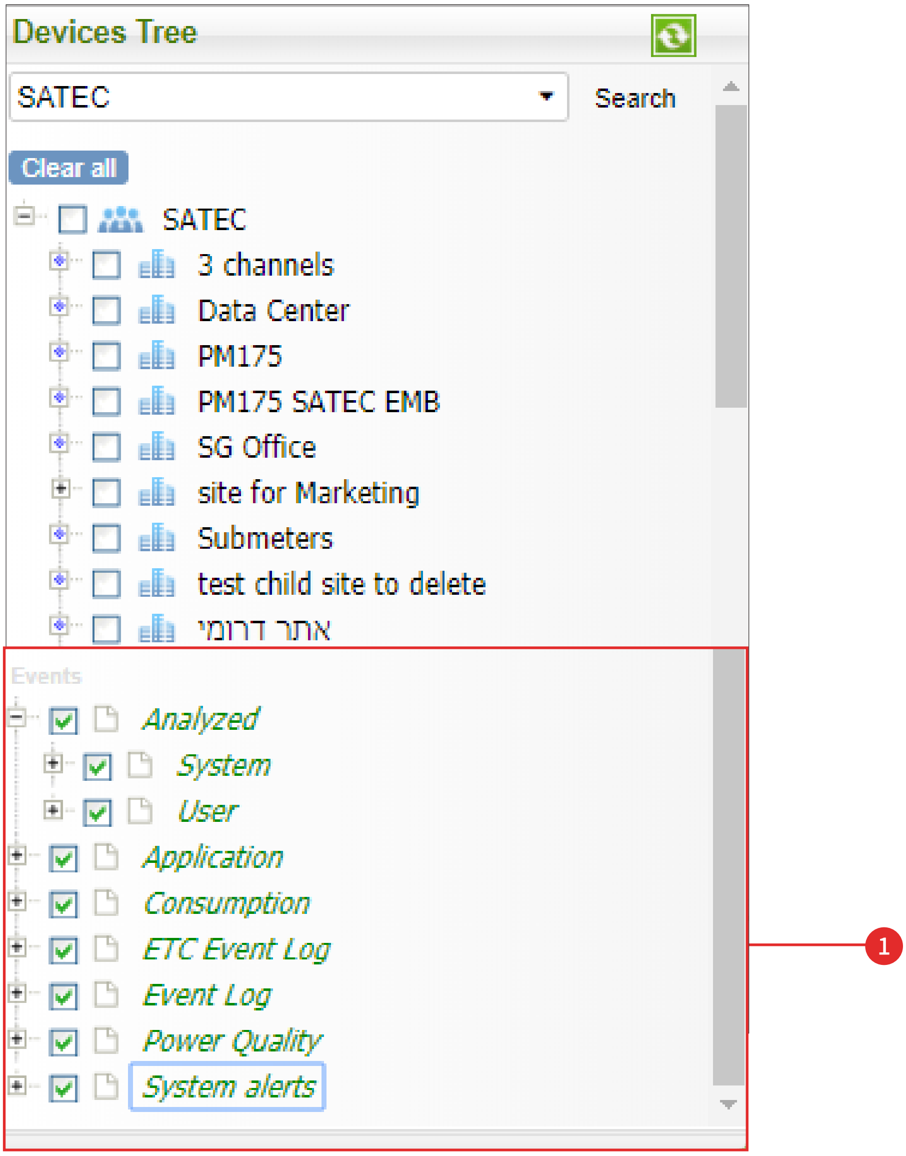


Events

The Events menu enables viewing of all system events, and includes:

- Event View
- Event Log
- Event Summary
- Notifications

> **Note**
> The device tree in the Event screens and Alert screens include an option to filter by events (1).



Event View

The Event View screen displays the events which have accumulated in the system in chronological order. The types of events displayed on this screen are set in the Administrator page (see Event View Definition on page 39).

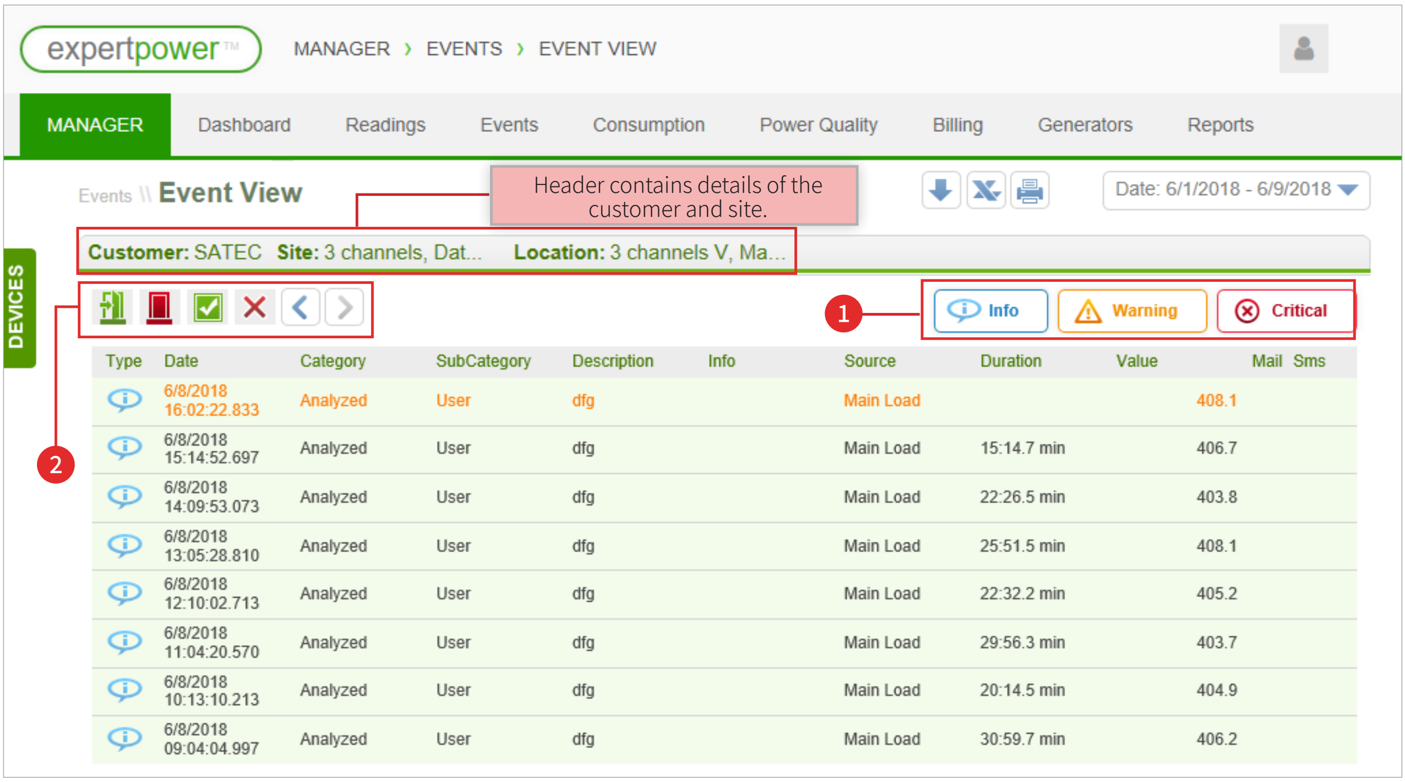
To display events:

1. Choose **Event View** from the Events menu.
2. Select the relevant devices(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

The events displayed on the screen are ranked by importance: critical, warning, and info. Clicking the status buttons (1) shows or hides events of different status levels. Active events appear in orange and inactive events appear in black.

Clicking one of the icons (2) shows or hides events according to the following categories:

- **Open Events –** events that have not yet met their closing conditions.
- **Closed Events –** events that are not active.
- **Checked Events –** events closed by the manager (even though the closing conditions had not yet taken place).
- **Unchecked Events –** events that were not approved by the manager.

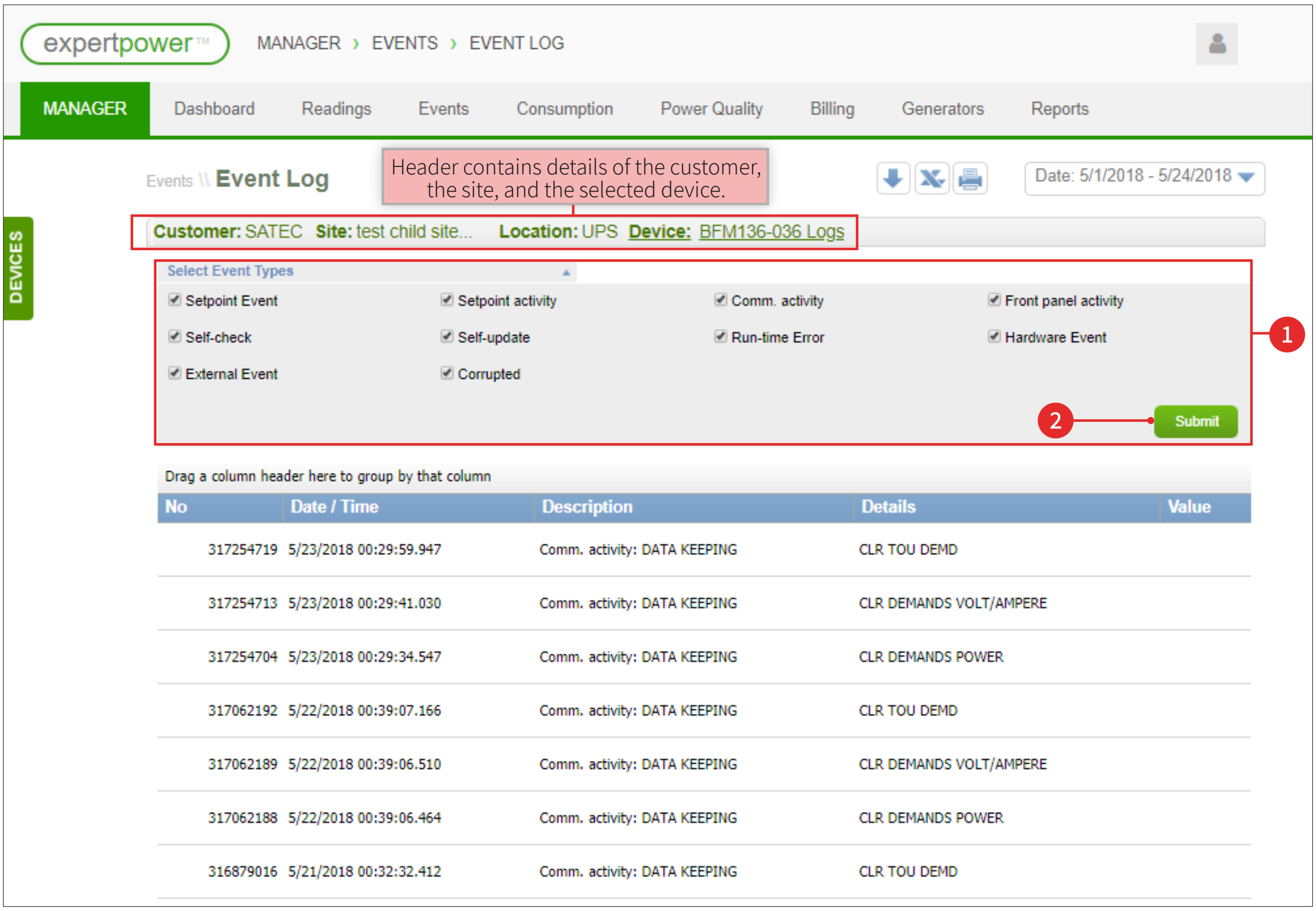


Event Log

The Event Log screen displays the events stored in the device event history.

To display the events:

1. Select **Event Log** from the Events menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range).
4. Choose types of events to display (1).
5. Click SUBMIT (2).

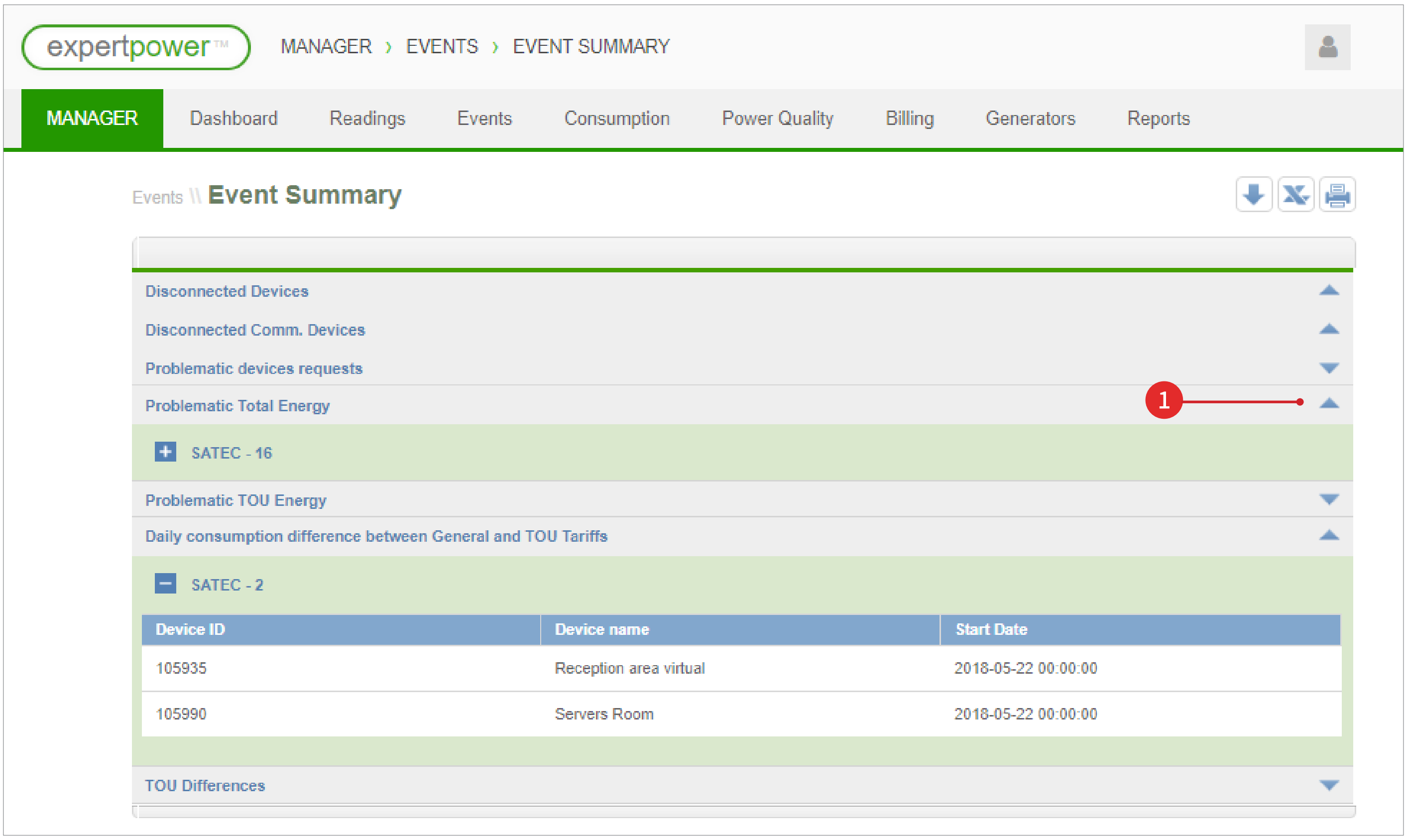


Event Summary

The Event Summary screen displays a list of the active events categorized by type of event.

To display the event summary:

1. Choose **Event Summary** from the Events menu.
2. Click on the blue triangle (1) to display the device(s) for which event(s) were recorded.

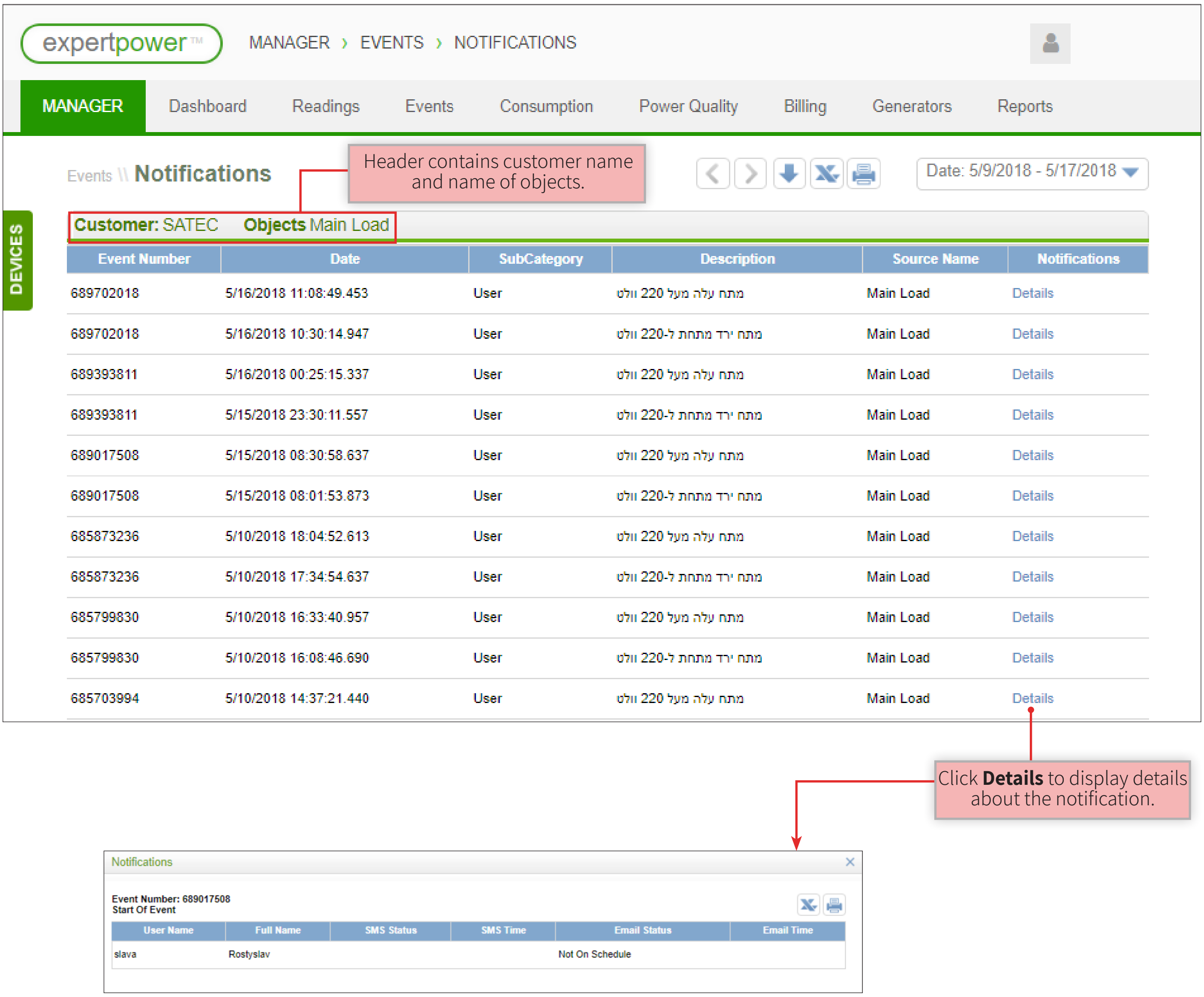


Notifications

The Notifications screen displays events for which a notification has been defined and has been triggered. To display these events:

1. Select **Notifications** from the Events menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).

A list of events with active notifications is displayed on the screen.



Consumption

The consumption screens display consumption data of the selected device(s) over a defined period, and include the following areas (depending on the user):

- Energy
- Water
- Air Conditioning Usage
- Gas
- Fuel

Each sub-menu includes the following options:

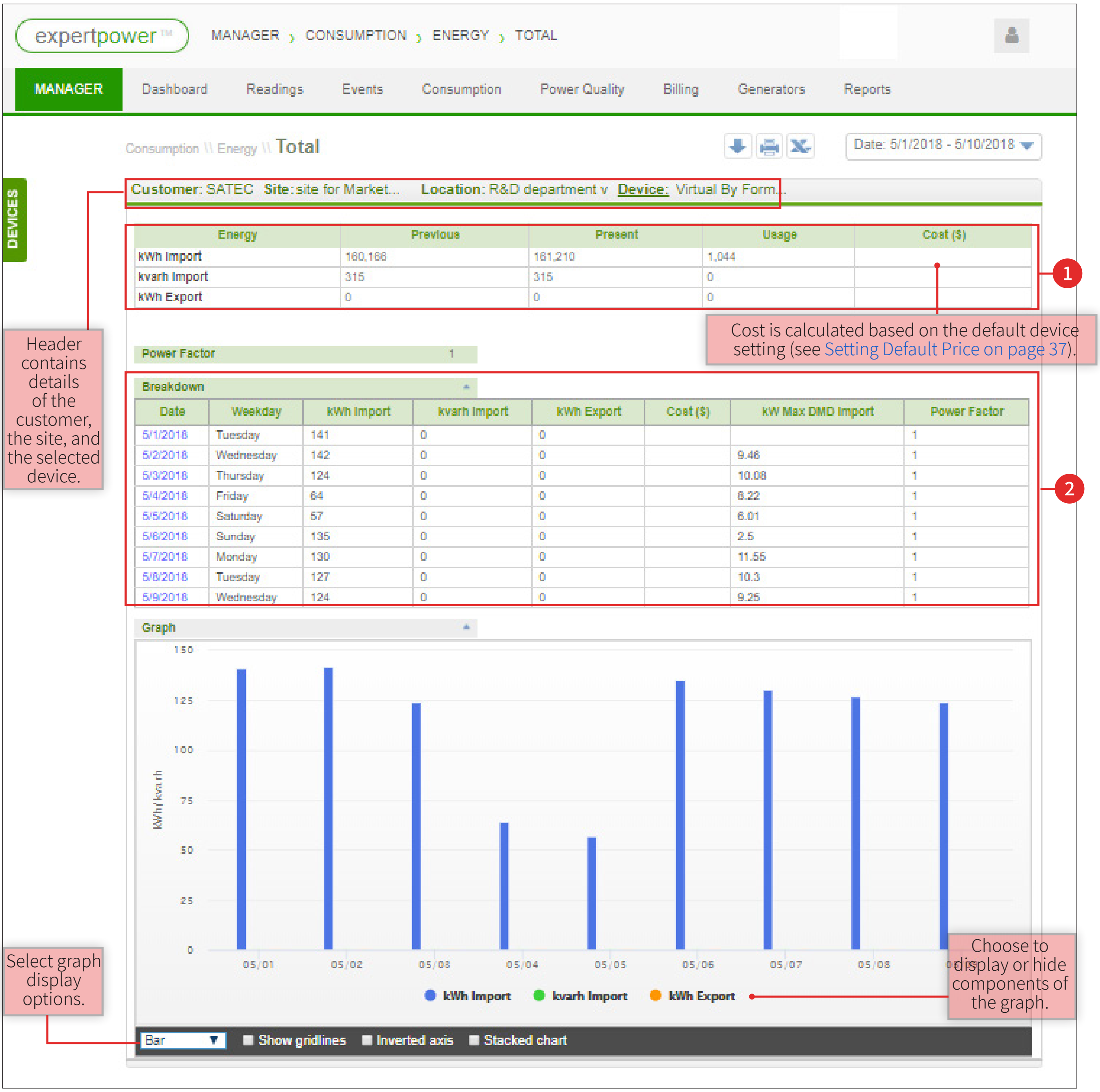
- **Total –** summation of consumption data by time periods.
- **TOU –** consumption data is summed by time of use (TOU) per rate, load, and time.
- **Total distribution –** device consumption arranged by energy source. Enables monitoring of the energy balance by examining the difference between the sum of the meters and the measurement of the main meter which is above them.
- **TOU distribution –** device consumption arranged by source of voltage and time of use (TOU).

Energy Consumption Data

The Total Energy screen displays energy consumption data of the selected device(s) in tabular and graphical formats.

1. Select **Energy** > **Total** from the Consumption menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

A summary of the data is displayed at the top of the screen (1), and detailed data is shown below (2).



Tip

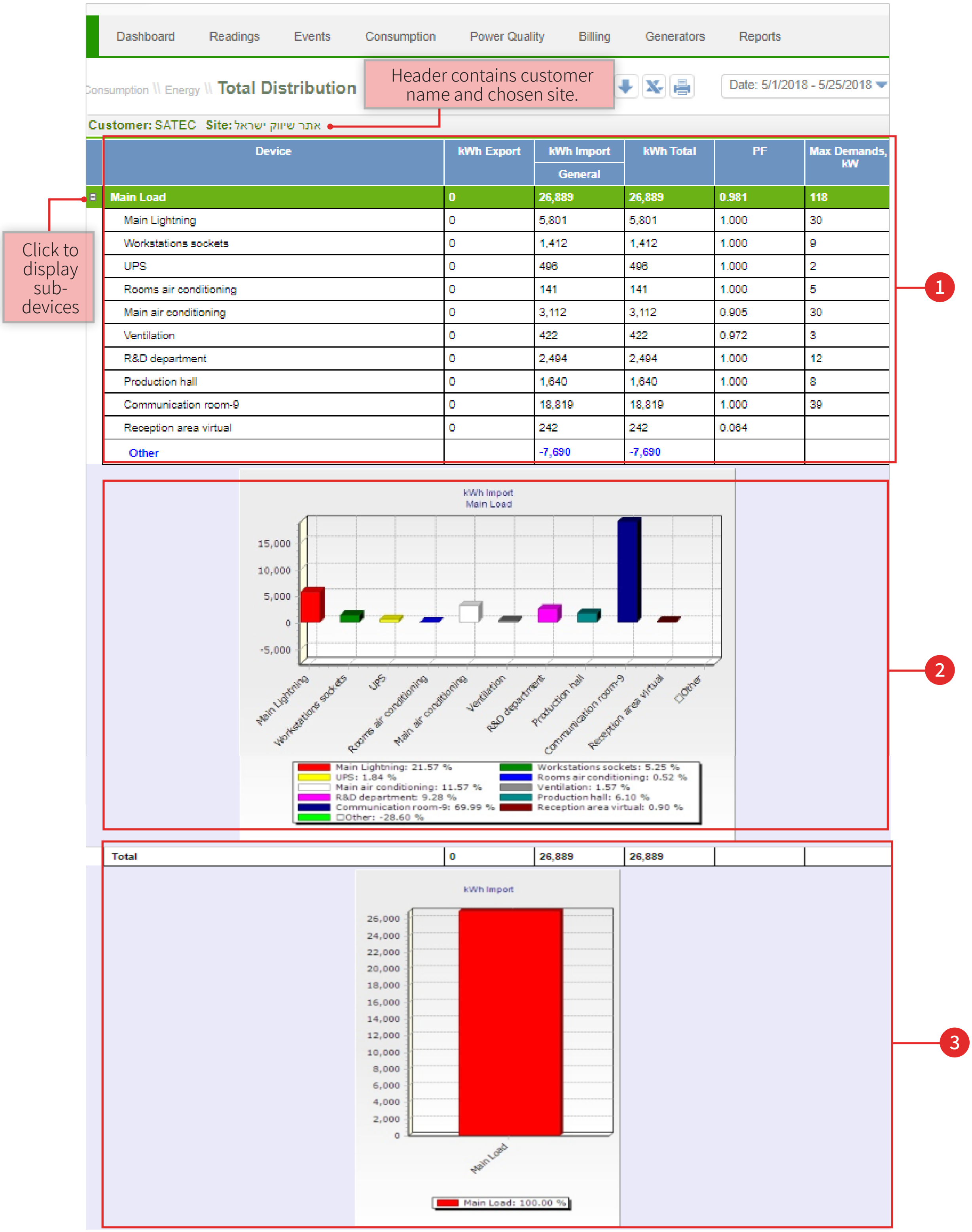
The structure of this screen is identical to the other consumption sub-menus (Total, TOU, Total Distribution, and TOU Distribution).

Energy Consumption Distribution Data

The Total Distribution screen shows the flow of energy at different levels, and flags a loss of energy. To view consumption distribution data:

1. Select **Energy** > **Total Distribution** from the Consumption menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

The table (1) lists a summary of the energy distribution data. Below the table this data appears in graph form (2), and below the graph a summary of the data is displayed (3).



Device	kWh Export	kWh Import General	kWh Total	PF	Max Demands, kW
Main Load	0	26,889	26,889	0.981	118
Main Lightning	0	5,801	5,801	1.000	30
Workstations sockets	0	1,412	1,412	1.000	9
UPS	0	496	496	1.000	2
Rooms air conditioning	0	141	141	1.000	5
Main air conditioning	0	3,112	3,112	0.905	30
Ventilation	0	422	422	0.972	3
R&D department	0	2,494	2,494	1.000	12
Production hall	0	1,640	1,640	1.000	8
Communication room-9	0	18,819	18,819	1.000	39
Reception area virtual	0	242	242	0.064	
Other		-7,690	-7,690		

Total	0	26,889	26,889		

Power Quality

The Power Quality screens display events affecting power quality and enable monitoring and analysis of these events. Power quality screens include:

- EN50160-2007 Standard
- EN50160-2010 Standard
- Power Quality Events
- Waveforms
- Faults

Billing

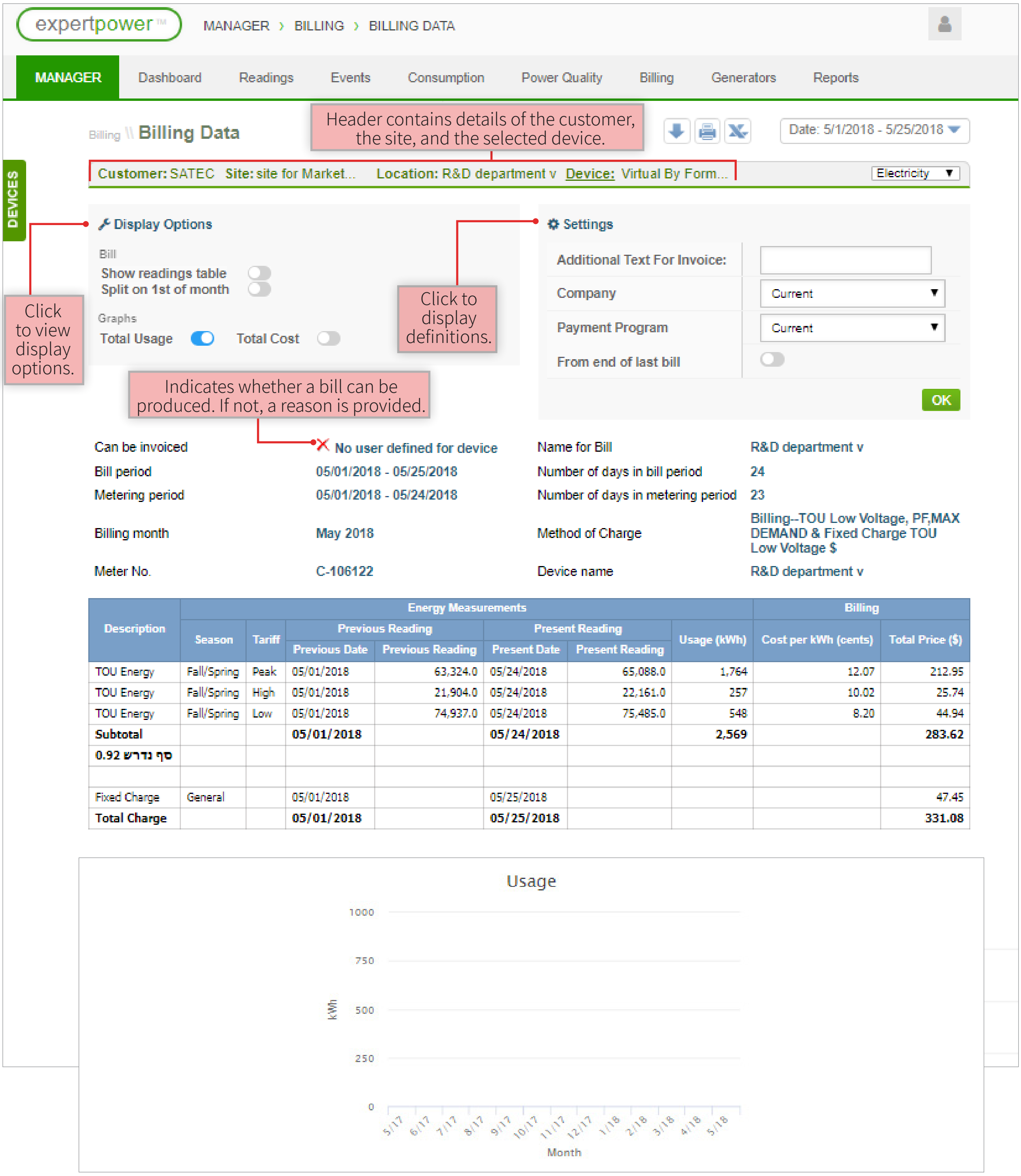
The Billing screens provide a means for viewing accounts and producing bills, and include:

- Billing Data
- Billing Comparison
- Total Cost Distribution
- TOU Cost Distribution

Billing Data

The Billing Data screen displays account details generated for the selected device. To generate an account breakdown:

1. Select **Billing Data** from the Billing menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 27).



Description	Energy Measurements							Billing	
	Season	Tariff	Previous Reading		Present Reading		Usage (kWh)	Cost per kWh (cents)	Total Price ($)
			Previous Date	Previous Reading	Present Date	Present Reading			
TOU Energy	Fall/Spring	Peak	05/01/2018	63,324.0	05/24/2018	65,088.0	1,764	12.07	212.95
TOU Energy	Fall/Spring	High	05/01/2018	21,904.0	05/24/2018	22,161.0	257	10.02	25.74
TOU Energy	Fall/Spring	Low	05/01/2018	74,937.0	05/24/2018	75,485.0	548	8.20	44.94
Subtotal			**05/01/2018**		**05/24/2018**		**2,569**		**283.62**
0.92 סף נדרש									
Fixed Charge	General		05/01/2018		05/25/2018				47.45
Total Charge			**05/01/2018**		**05/25/2018**				**331.08**

Tip

The display options and settings can be set when creating or editing the billing program (see Billing Administration on page 27).

Invoices History

The Billing menu enables viewing of bills that were previously generated.

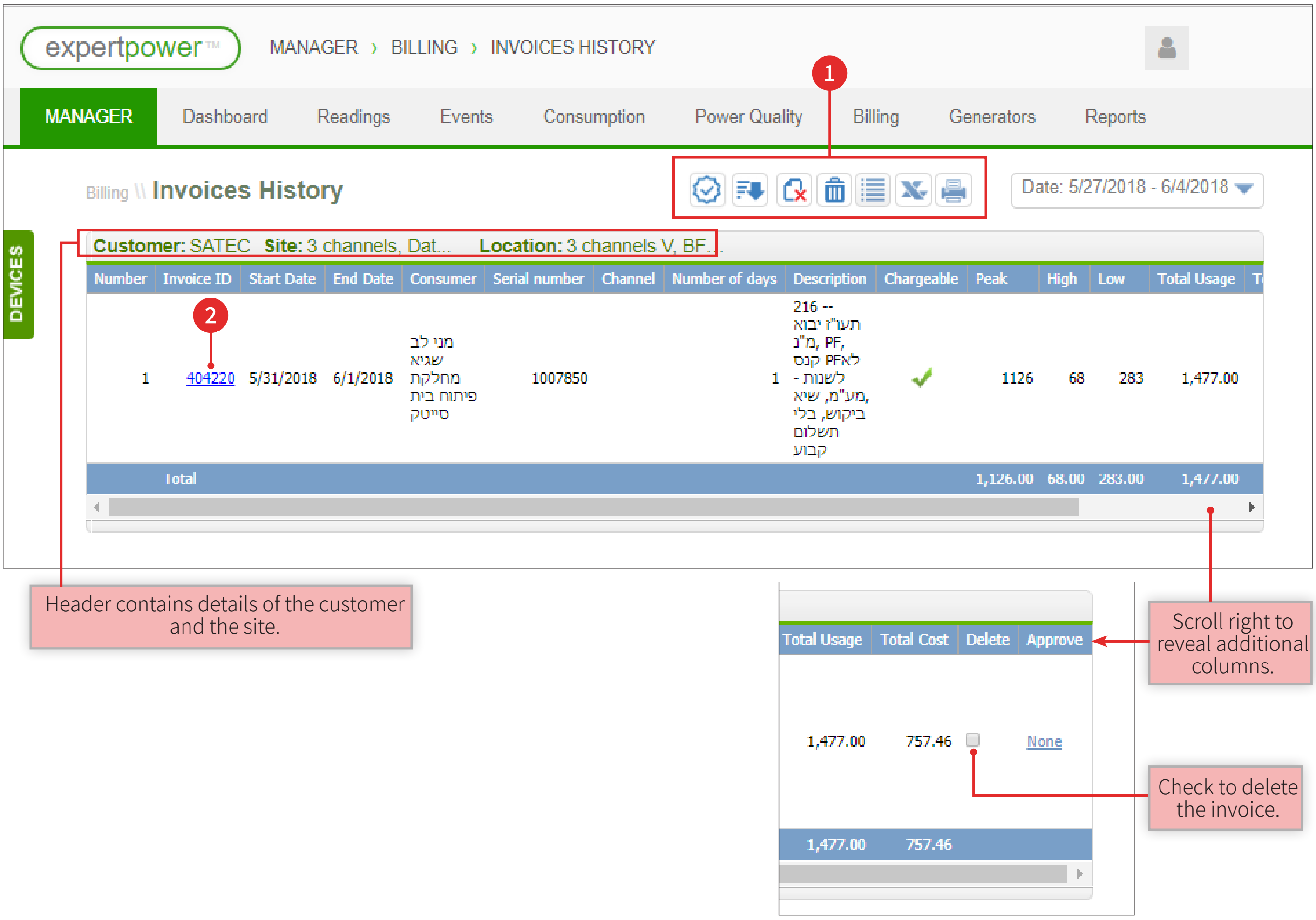
To view invoice history:

1. Select **Invoices History** from the Billing menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

The buttons (1) on the screen enable the following actions:

- **Approval –** approve invoices (see Invoice Approval on page 29).
- **Latest exports –** view all invoices that were recently generated by the manager.
- **Delete invoices –** delete selected invoices.
- **Delete all –** delete invoices based on a selected date range.
- **Concatenate invoices –** create a PDF which contains all the displayed invoices.
- **Export to Excel –** generate an Excel spreadsheet of the invoice history file.
- **Export to PDF –** generate a PDF of the invoice history file.

The serial number of each invoice (2) serves as a link to display that invoice.

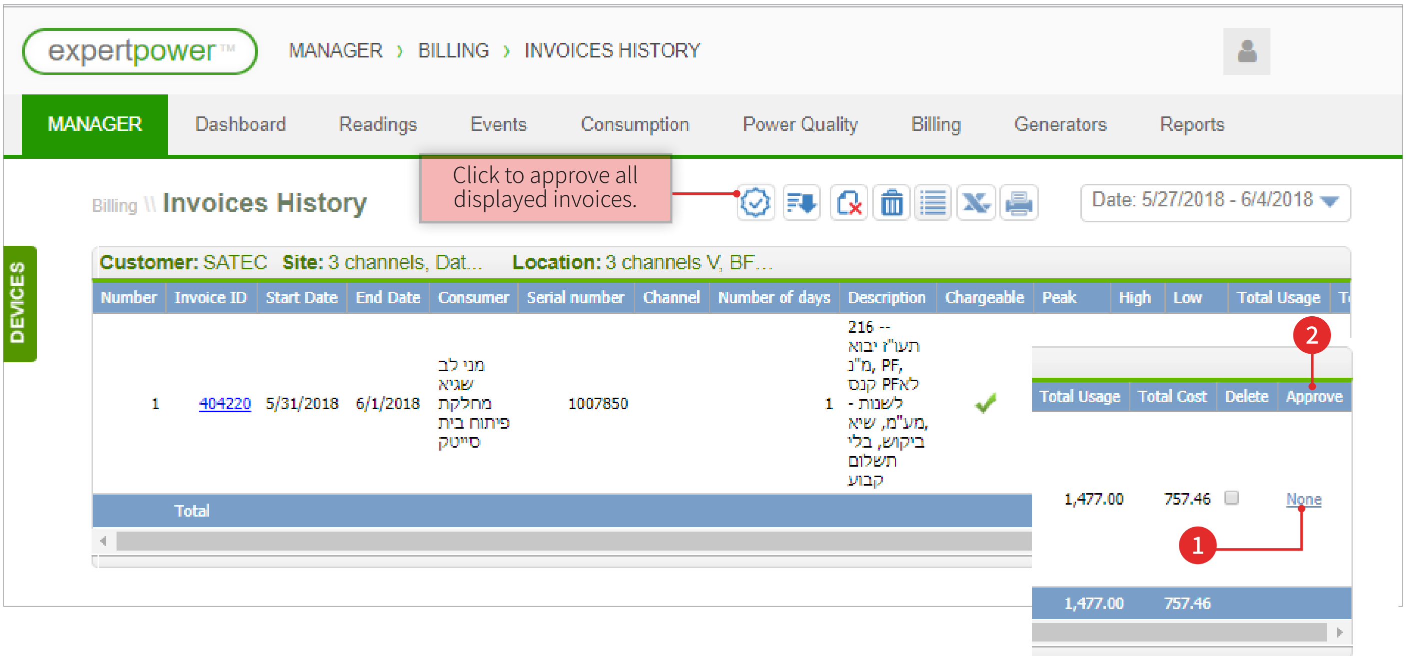


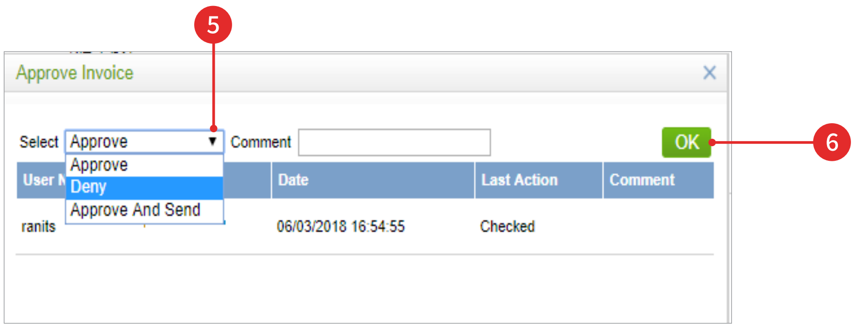
Invoice Approval

Invoice approval is done in two stages: review and approval. Upon completion of both steps, the invoice may be e-mailed.

To approve invoices:

1. Display an invoice by performing steps 1-3 in the section Invoices History on page 28.
2. Click on the invoice status (1) in the Approve column (2).
3. Choose either **Check** or **Deny** (3) and click OK (4).
4. Invoice status (1) changes to checked, and the approval window fields change (5).
5. Choose **Approve**, **Deny**, or **Approve and Send** from the drop down menu (5). Selecting **Approve and Send** approves the invoice and sends it in an e-mail.
6. Click OK (6).





Billing Comparison

The Billing Comparison Utility screen enables (for auditing purposes) the comparison between the charge received from the electric company and the charge generated by the system.

To compare charges:

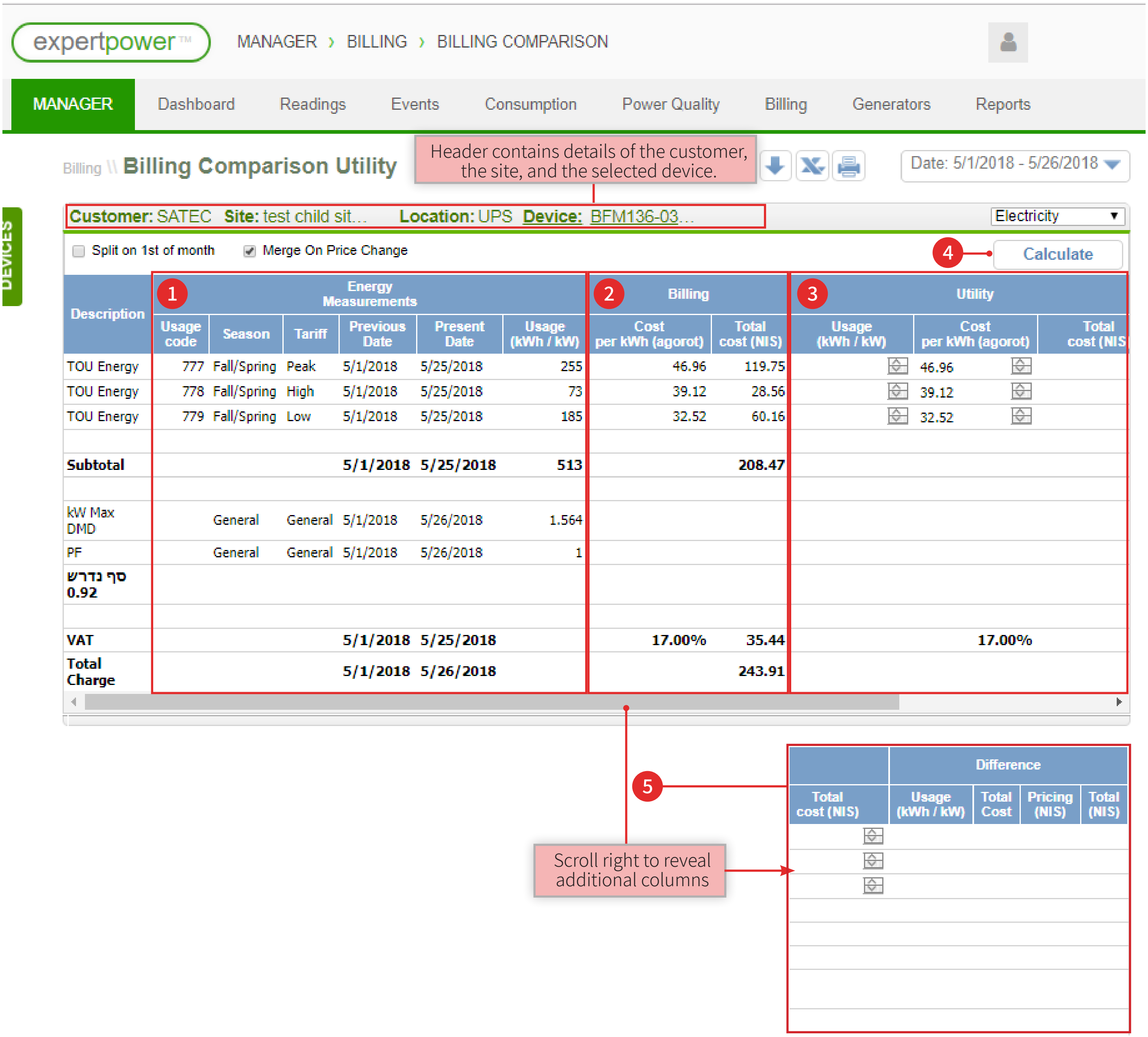
1. Select **Billing Comparison** from the Billing menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).

The billing data shown for comparison are:

- **Energy Measurements (1) –** consumption data measured in the system.
- **Billing (2) –** cost measured in the system.
- **Electric company account details (3) –** consumption and cost data as measured by the electric company.

4. Enter the invoice data of the electric company (3).
5. Click CALCULATE (4).

Results of the comparison appear in the Differences column (5).



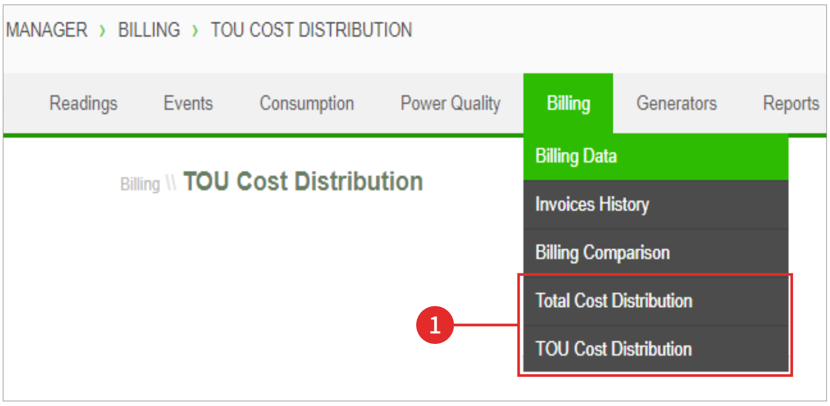
Cost Distribution

There are two types of energy cost distributions:

- **Total Cost Distribution –** cost comparison by period for multiple meters.
- **TOU Cost Distribution –** cost comparison by peak, high, and low levels.

To view billing information by cost distribution:

1. Choose the desired distribution type from the Billing menu (1).
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Set the desired date range (see Setting Data Range on page 6).



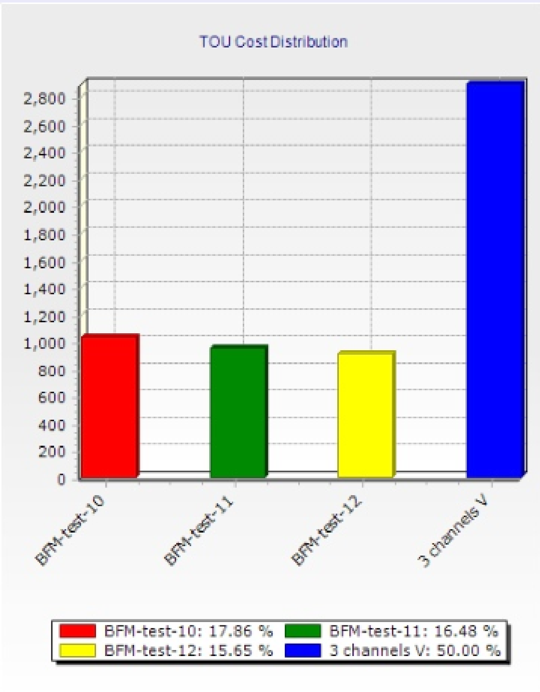
The following billing data is displayed:

The header contains customer name and site details

DEVICES

Customer: SATEC **Site:** 3 channels Electricity

Device	kWh, Cost, NIS			Total Cost, NIS
	Peak	High	Low	
BFM-test-10	683.74	116.58	233.82	1,034.13
BFM-test-11	661.67	98.58	194.14	954.39
BFM-test-12	622.69	95.06	188.62	906.37
3 channels V	1,968.09	310.22	616.58	2,894.89
Total	**3,936.19**	**620.44**	**1,233.16**	**5,789.79**

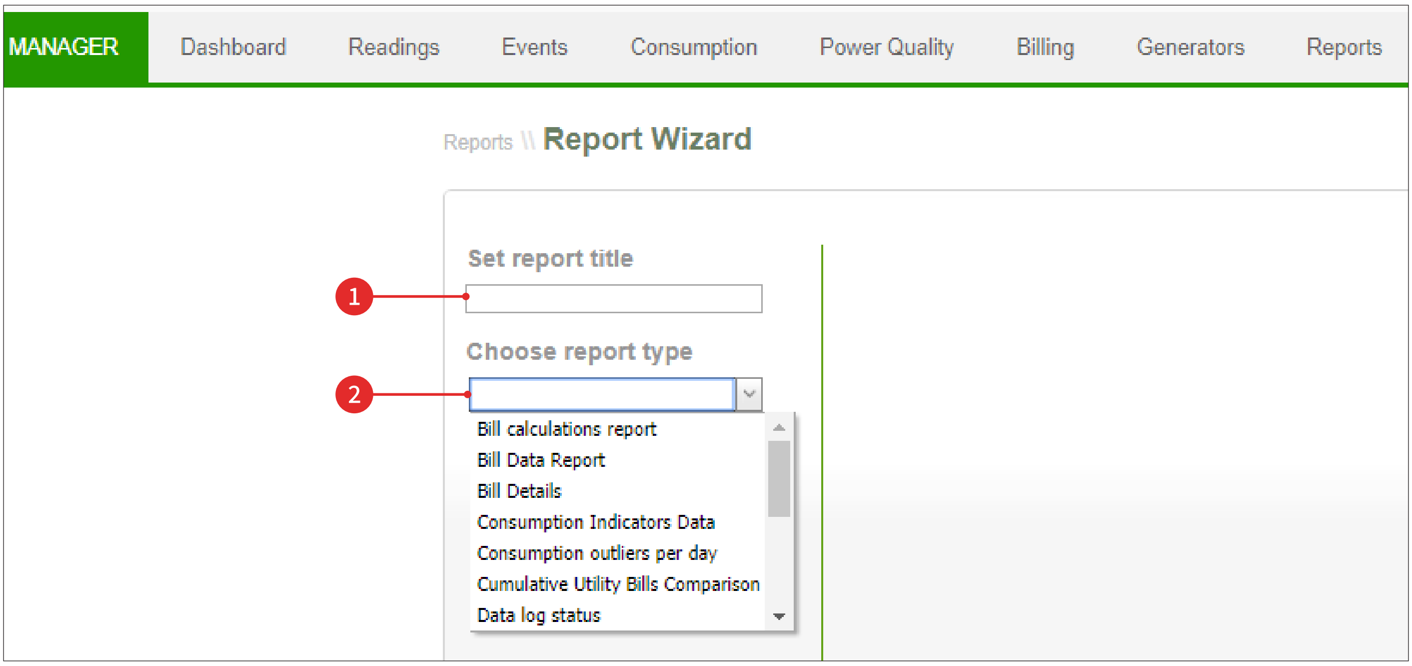


Reports

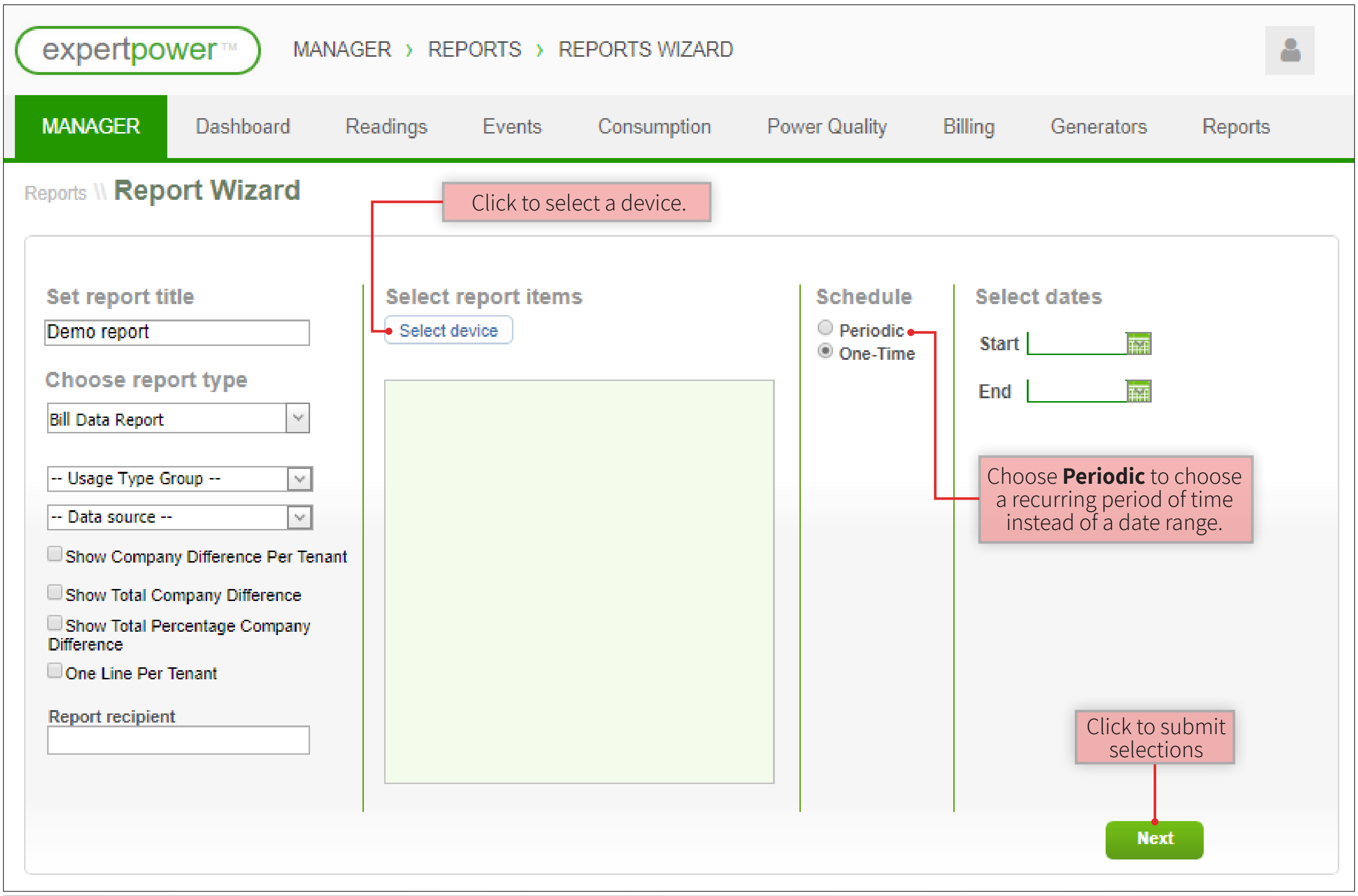
The report generation wizard enables defining a report type and selecting which parameters to display. Each generated report is noted in the list of reports and can be edited at any time.

To produce a new report:

1. Select **Reports Wizard** from the Reports menu.
2. Enter a report title (1).
3. Choose report type from the list (2).

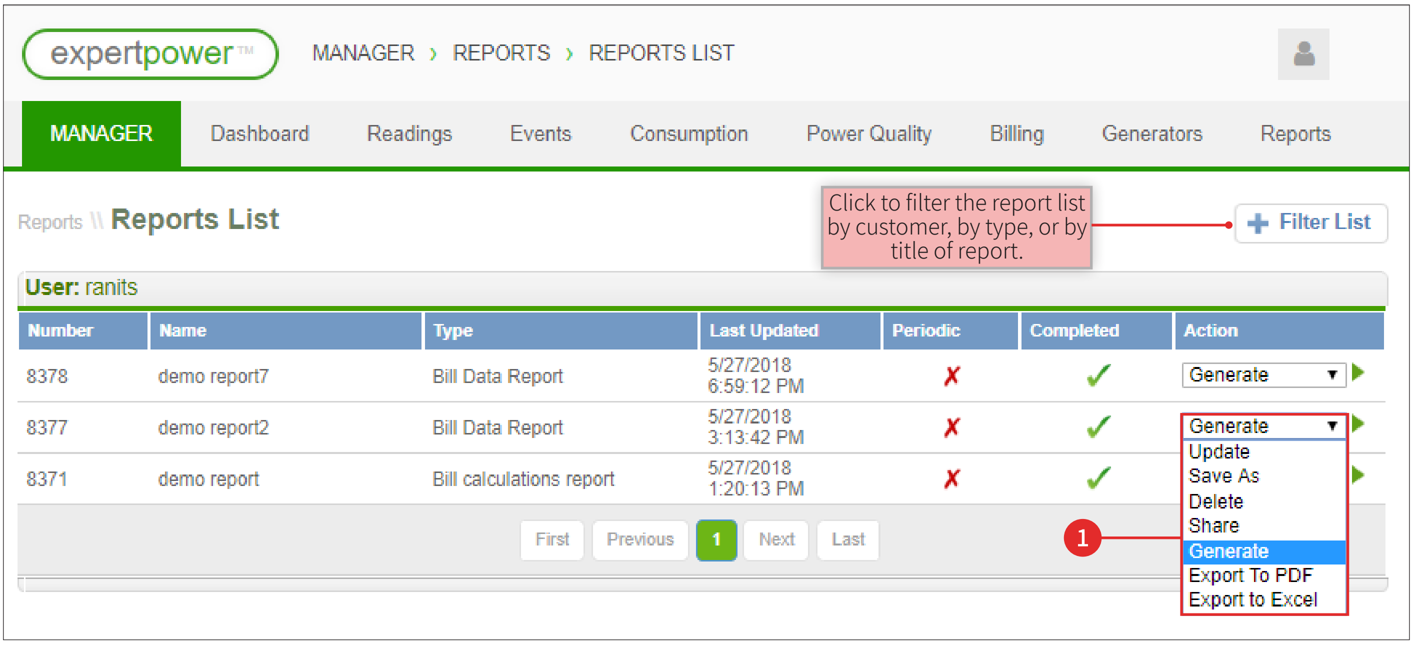


The following screen opens to define report settings.



To select a report from a list of reports:

1. Select **Reports List** from the Reports menu.
2. Choose the desired action from the drop-down menu (1).
   - **Update –** change the report definitions.
   - **Save As –** save a copy of the report with a different name.
   - **Delete –** erase the report from the list of reports.
   - **Share –** share a copy of the report with someone else.
   - **Generate –** create a report.
   - **Export to PDF**
   - **Export to Excel**
   - **Results –** display the periodic reports generated (this option exists only in periodic reports).



4 Administrator Settings

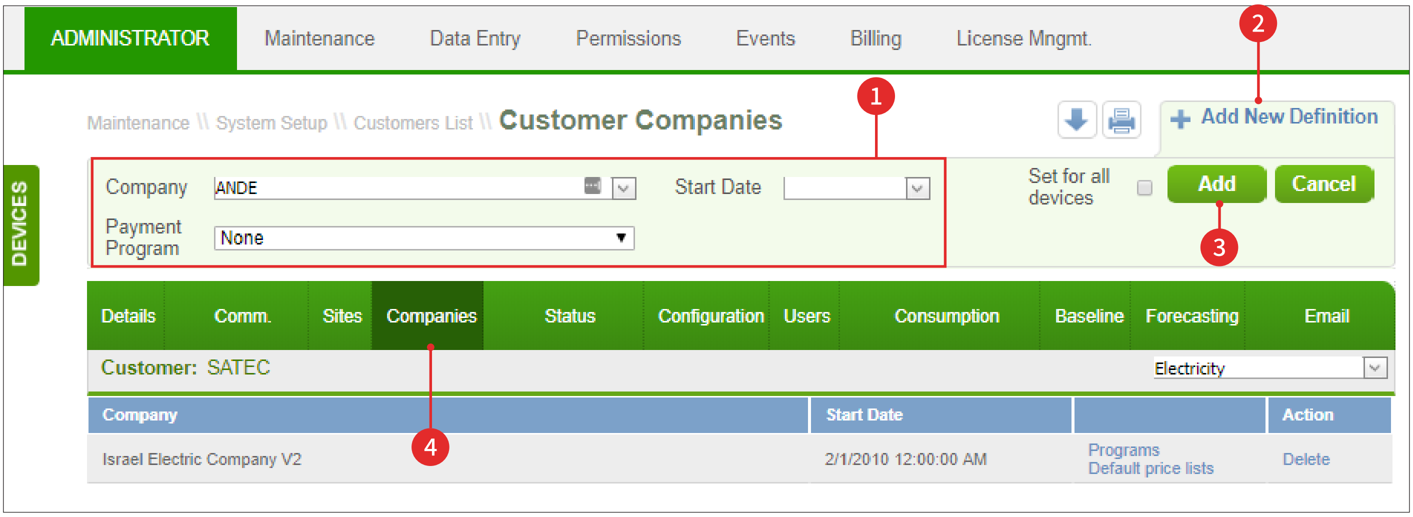
The following system options are set at the administrator level:

- Company Settings
- Billing Administration
- Link a Billing Program to a Device
- Site Setup
- Event View Definition
- Analyzed Events
- Notification Settings
- Add Meter

Company Settings

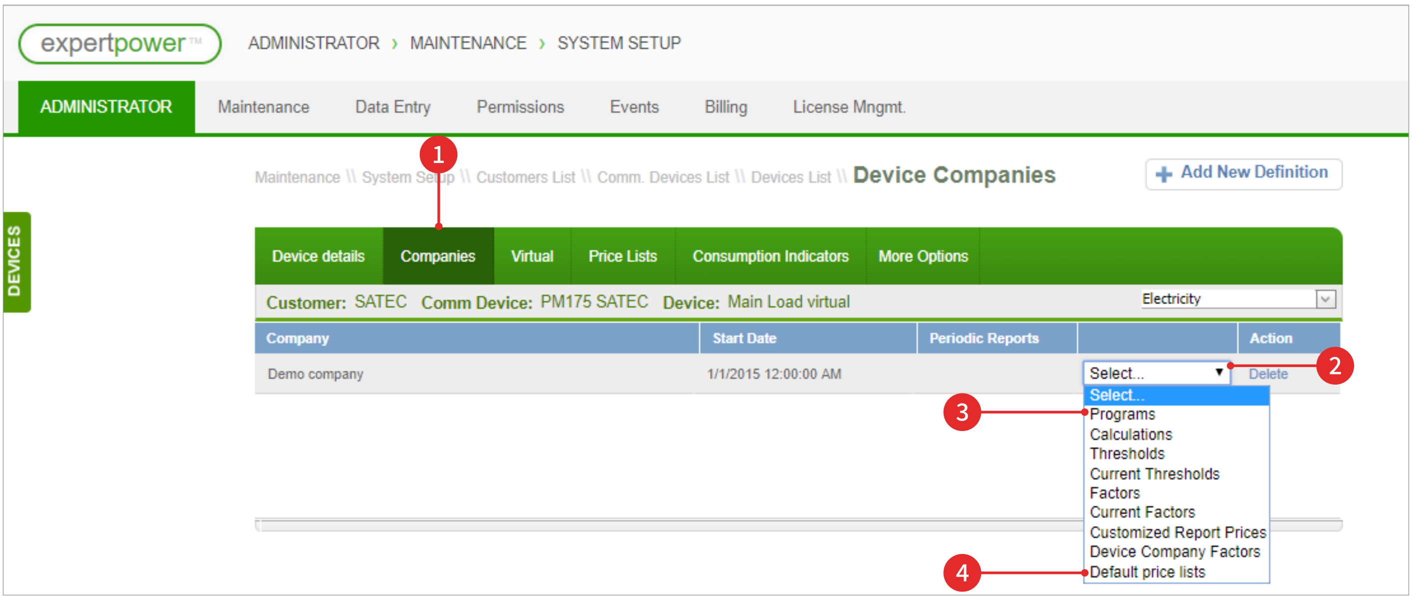
To define a new company:

1. Select **System Setup** from the Maintenance menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Select the **Companies** tab (4).
4. Click **+ Add New Definition** (2).
5. Enter information for the new company, including the payment program and start date (1).
6. Click ADD (3).



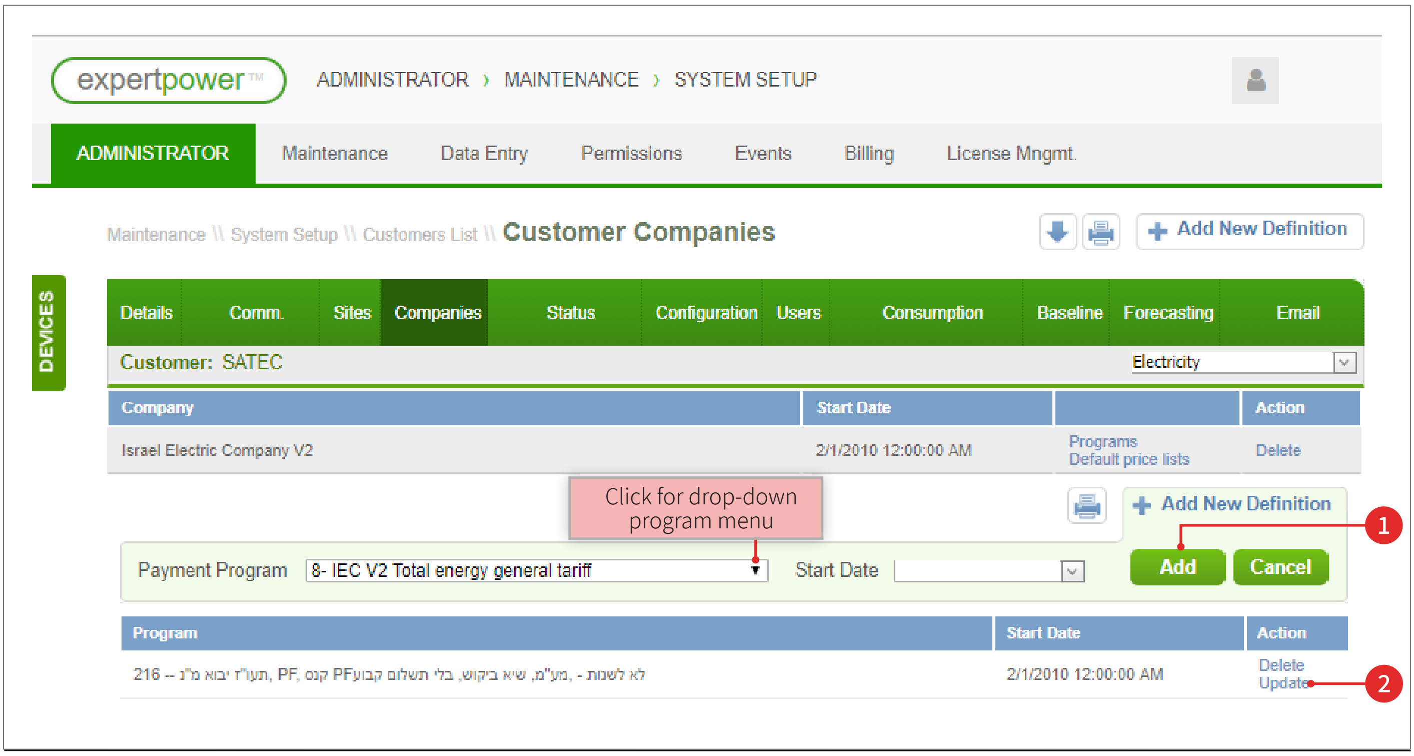
Link a Billing Program to a Device

1. Select **System Setup** from the Maintenance menu.
2. Select the relevant device(s) in the device tree (see Selecting Devices on page 7).
3. Select the **Companies** tab (1).
4. If a company is not defined, define a new company (see Company Settings on page 35).
5. From the drop down list (2), select **Programs** (3) to choose a program (see Choose Billing Program below).
6. From the drop down list (2), select **Default price lists** (4) to choose a default price (see Setting Default Price on page 37).



Choose Billing Program

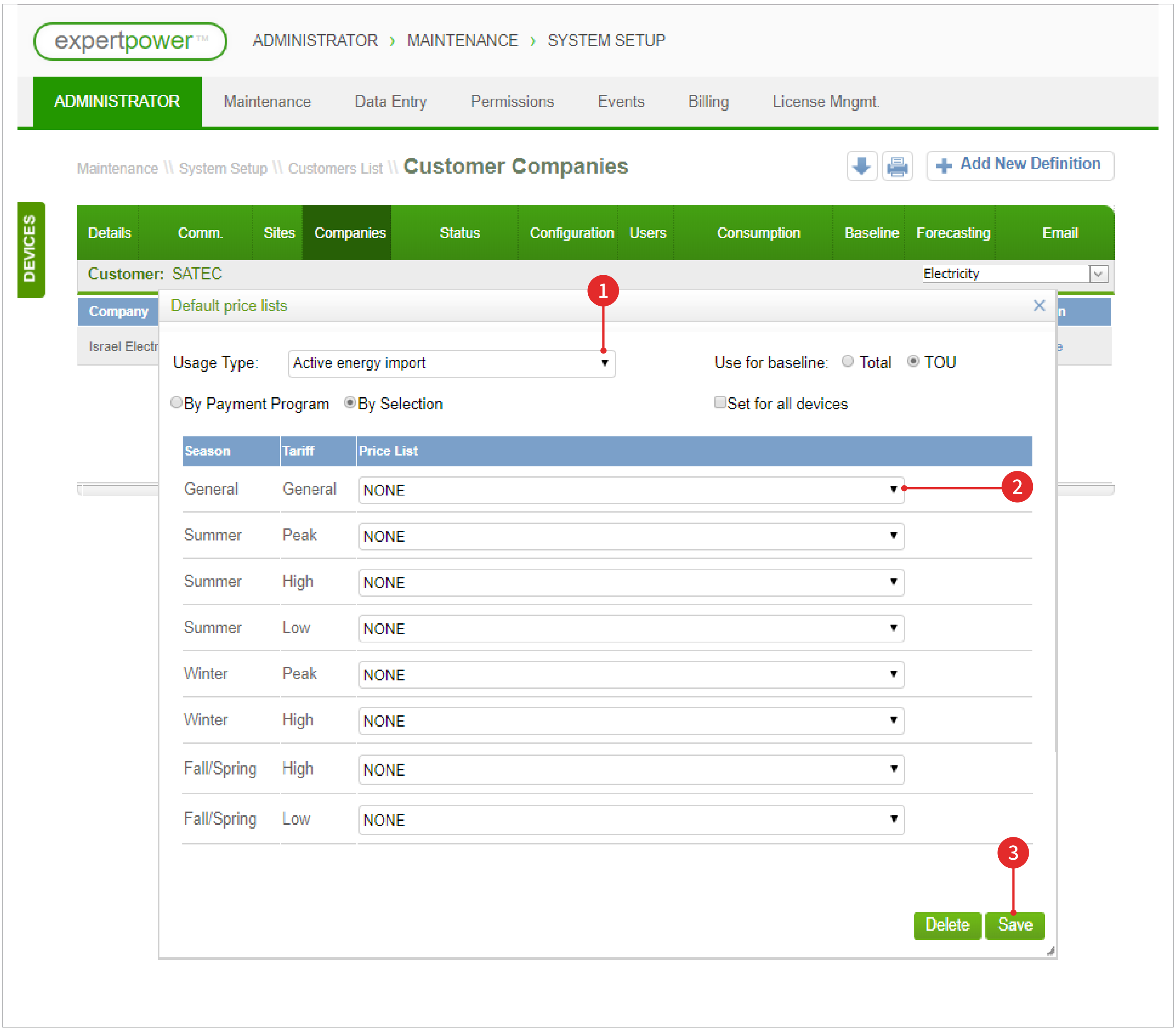
1. Click **Update** (2) to change a program selection or edit the start date.
2. Click ADD (1).



Setting Default Price

When choosing default price lists (see Link a Billing Program to a Device on page 36), the default price list window opens.

1. Choose usage type (1).
2. Choose from the prices that appear in the drop-down menu (2).
3. Click Save (3).

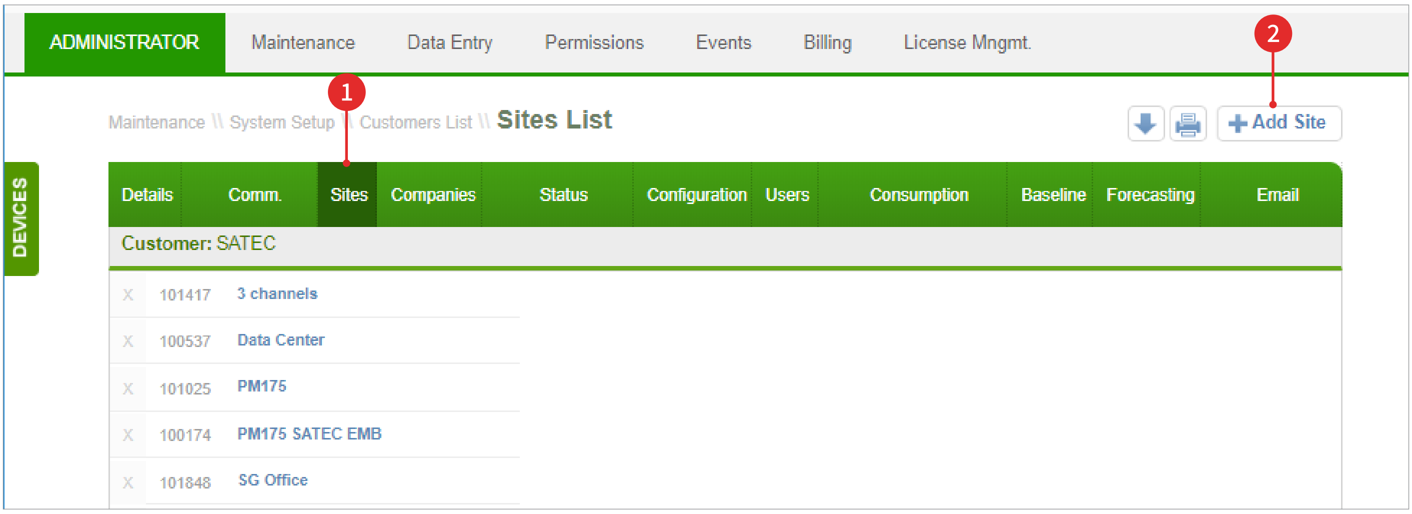


Site Setup

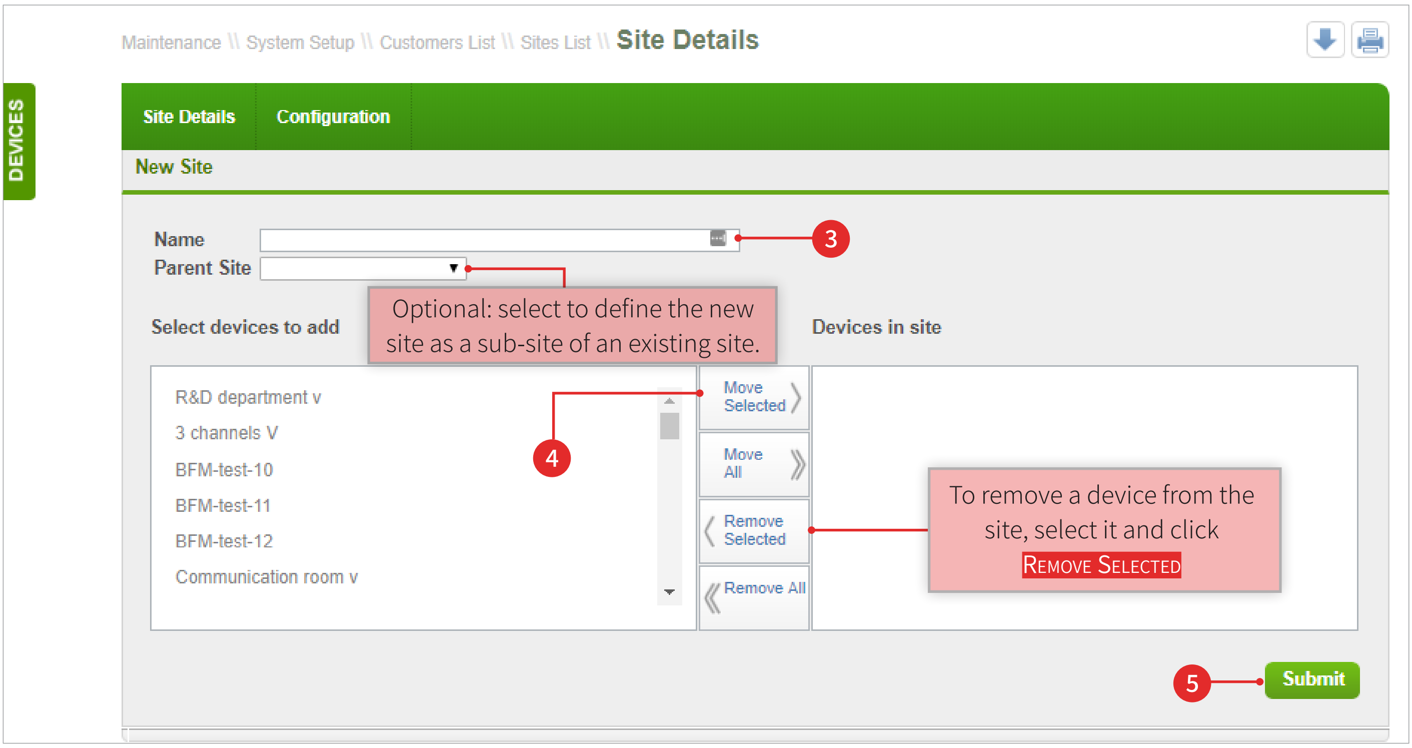
A site is a set of meters which appear together in the device tree and which are often chosen simultaneously.

To define a site:

1. Select **System Setup** from the Maintenance menu.
2. Choose the desired customer from the list of customers.
3. Select the **Sites** tab (1).
4. Click + ADD SITE (2).



5. Define a name for the site (3).
6. Select device(s) to add to the site and click MOVE SELECTED (4).
7. Click SUBMIT (5).



Event View Definition

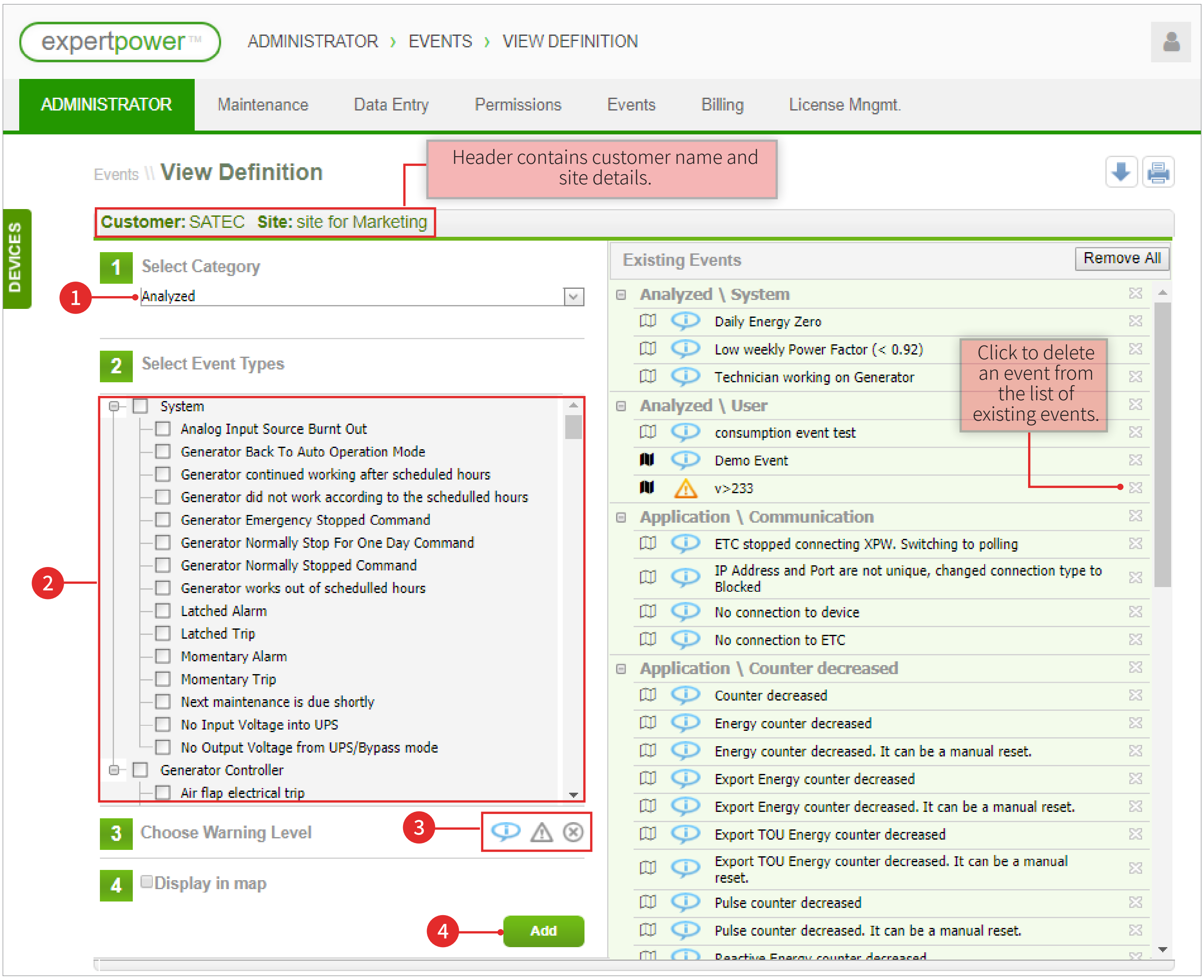
Defining event views enables the selection of events displayed in the Event View screen (see Event View on page 19). The customer has the option to add, edit, and download various events.

1. Select **View Definition** from the View menu.
2. Select the desired customer or site from the device tree (see Selecting Devices on page 7).
   - When selecting a site, events belonging to associated devices are displayed.
   - When selecting a device, events and communication converters are displayed.
3. Choose the desired category from the drop down menu (1).
4. Choose the desired event type (2).
5. Choose the warning level (3).

> **Tip**
> The warning level affects alarm scheduling (see Set Alarm Scheduling on page 42).

6. Click ADD (4).

The selected event now appears in the list of existing events.

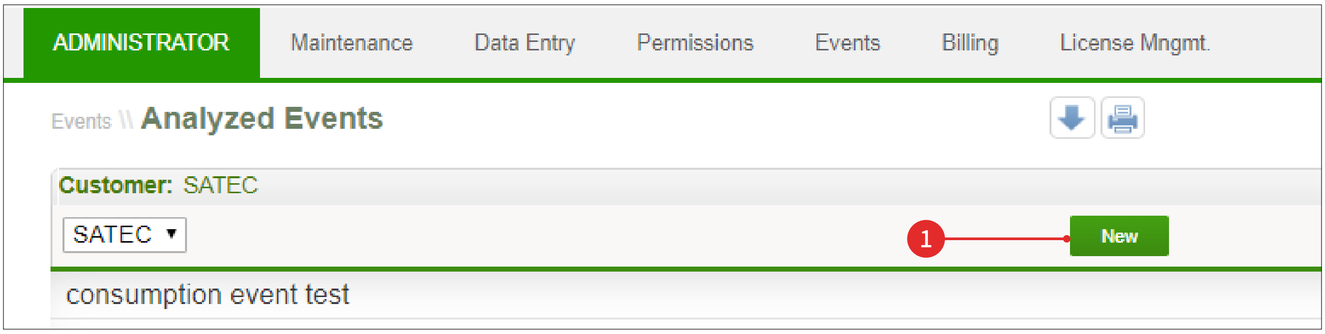


Analyzed Events

Analyzed events are events which are analyzed based on criteria defined by a user.

To define an analyzed event:

1. Select **Analyzed Events** from the Events menu.
2. Click New (1).

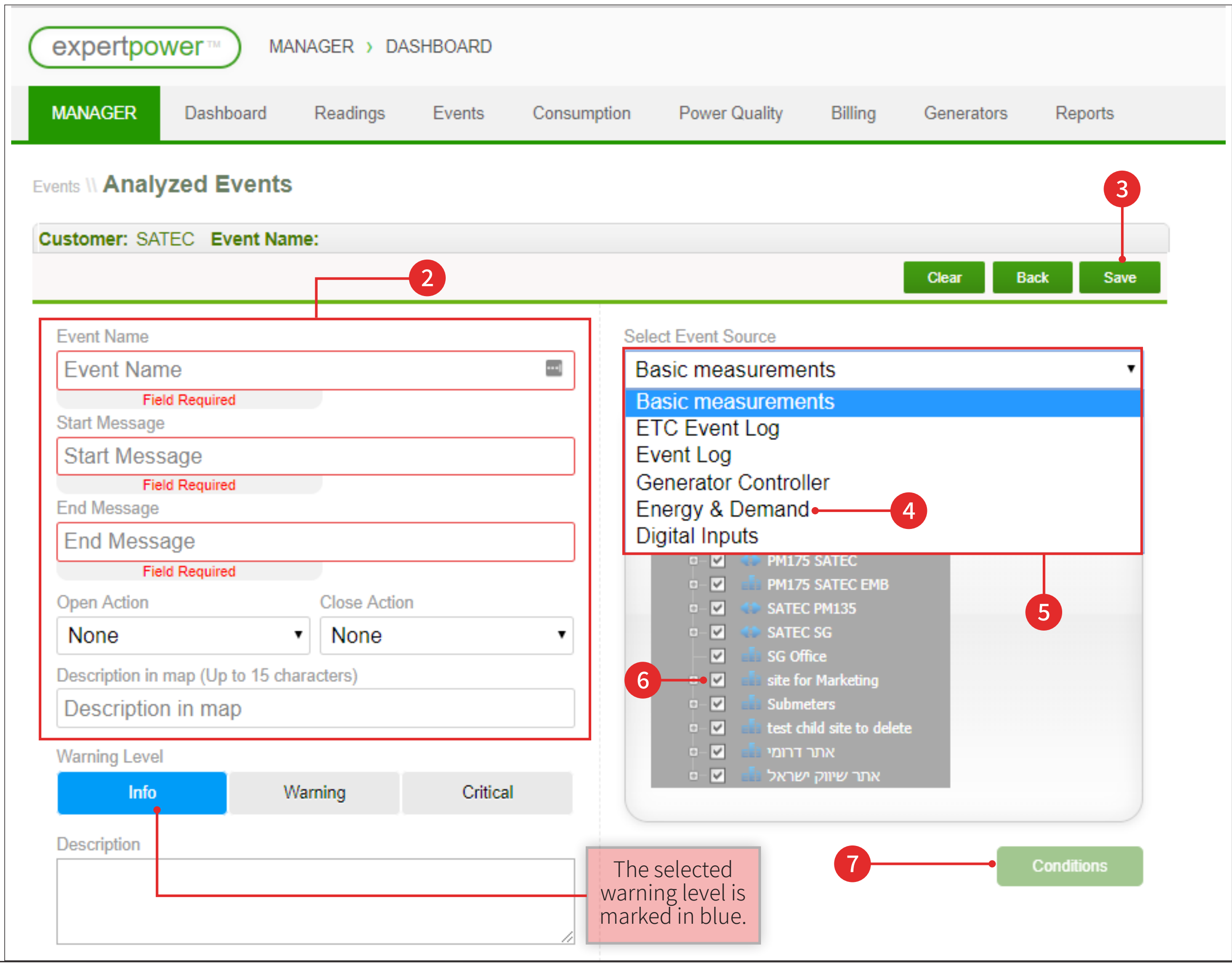


3. Define event details (2).
4. Choose an event source from the drop-down menu (5).

> **Tip**
>
> Data sources for energy and demand data require defning a formula. To define a formula, select **Energy & Demand** (4) and click Choose Formula, which replaces the Conditions button (7).

5. Select the desired sites or devices (6).
6. Click Conditions (7) to set conditions for the event (see Defining Criteria for Analyzed Event on page 41).
7. Click Save (3).

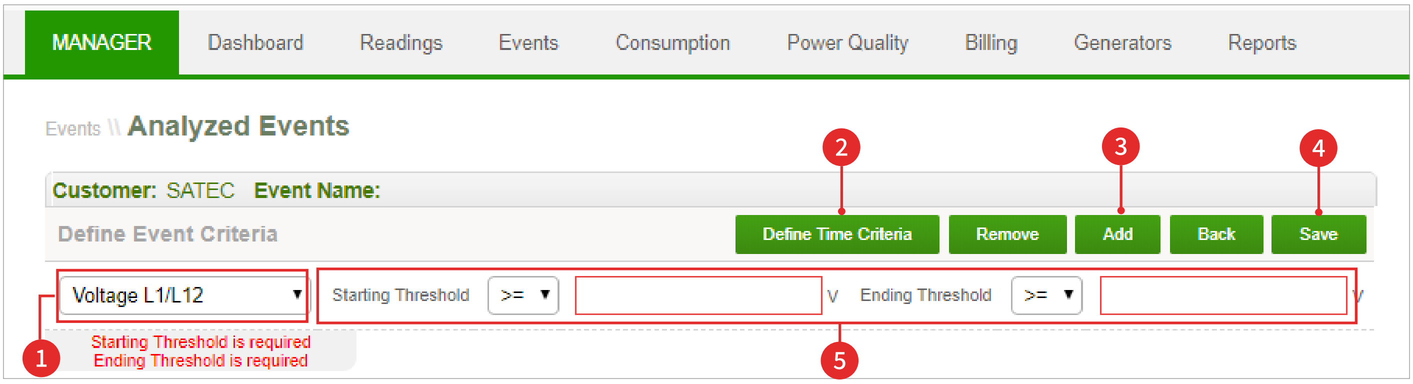
Analyzed events are added to the list of events, and notifications may be set for them (see Notification Settings on page 42).



Defining Criteria for Analyzed Event

An analyzed event is opened and closed based on pre-defined conditions. To set these conditions:

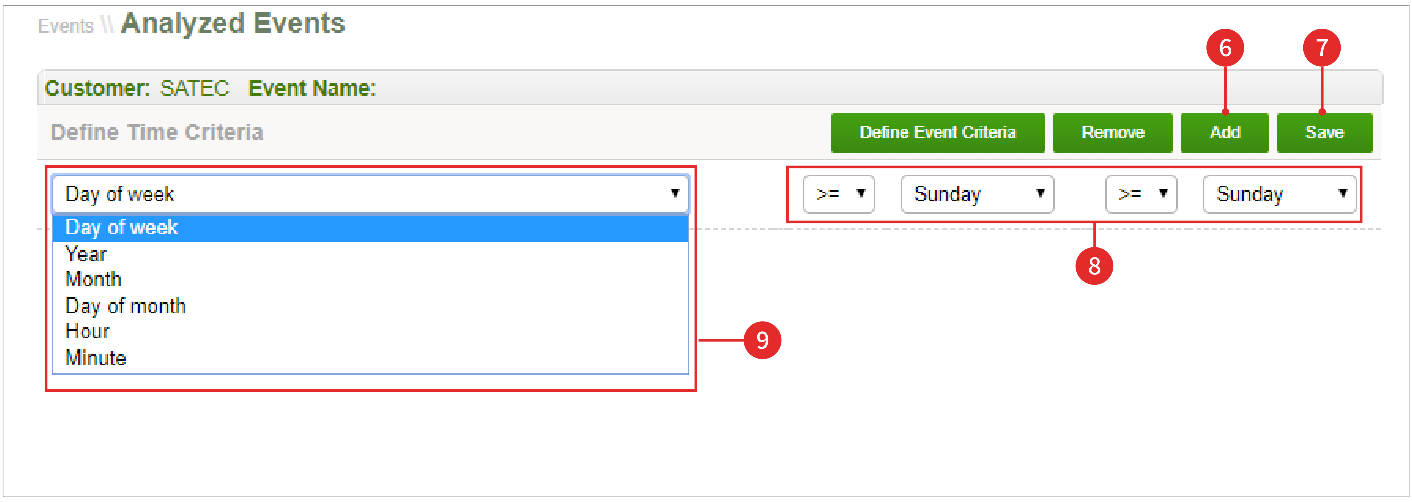
1. Click CONDITIONS (see Analyzed Events on page 40).
2. Click ADD (3) to begin a new event definition.
3. Choose a triggering parameter from the drop-down menu (1).
4. Set threshold triggers (5) for the open and close actions.
5. Click SAVE (4).
6. Click DEFINE TIME CRITERIA (2).



The Define Time Criteria window opens.

7. Click ADD (6).
8. Choose the time frame (9) from the drop down menu.
9. Define beginning and ending parameters for the time frame (8).
10. Click SAVE (7).

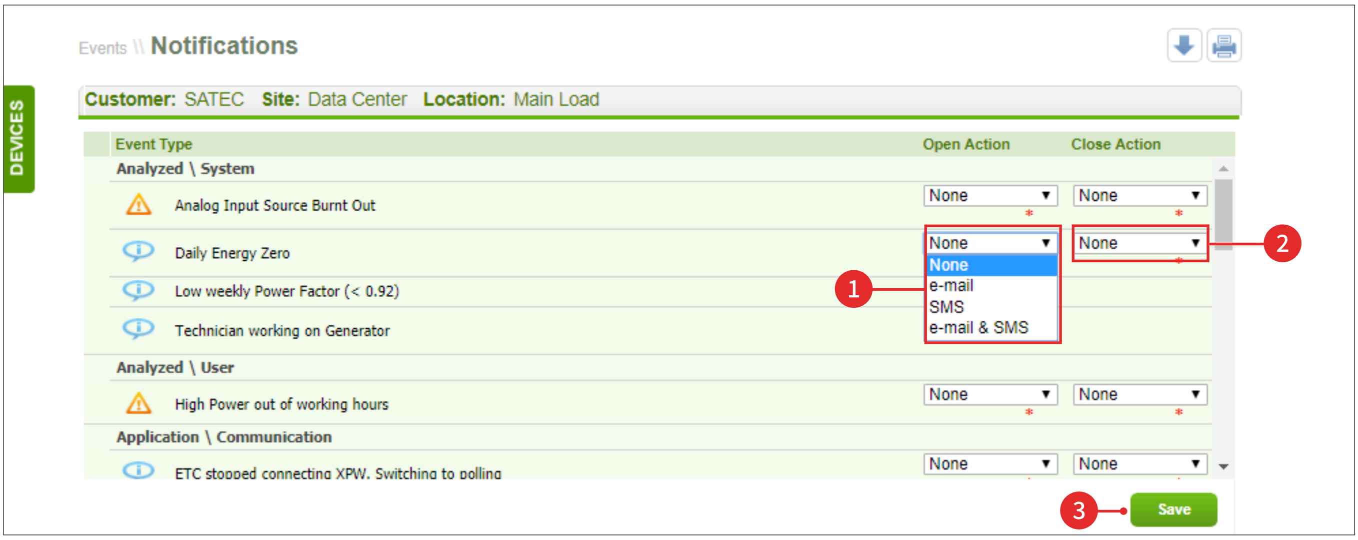
The analyzed event is added to the list of existing events.



Notification Settings

Notifications can be set, per device, for events in the system.

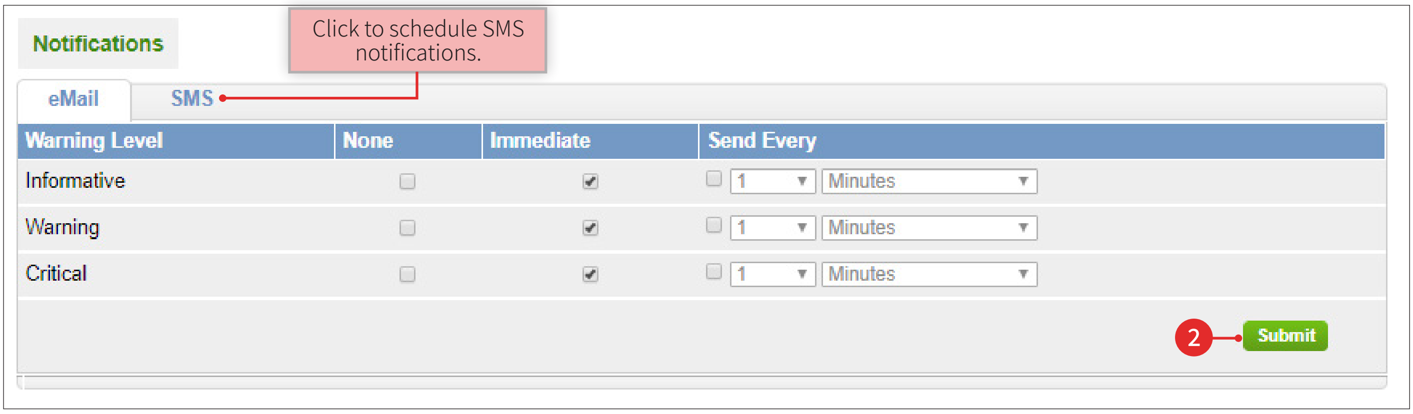
1. Select **Notifications** from the Events menu.
2. Select the desired site or device in the device tree (see Selecting Devices on page 7).
3. Optional: select an open action (1) to trigger the opening of the event. Select a close action (2) to trigger the closing of the event.
4. Click SAVE (3).



Set Alarm Scheduling

To schedule an alarm:

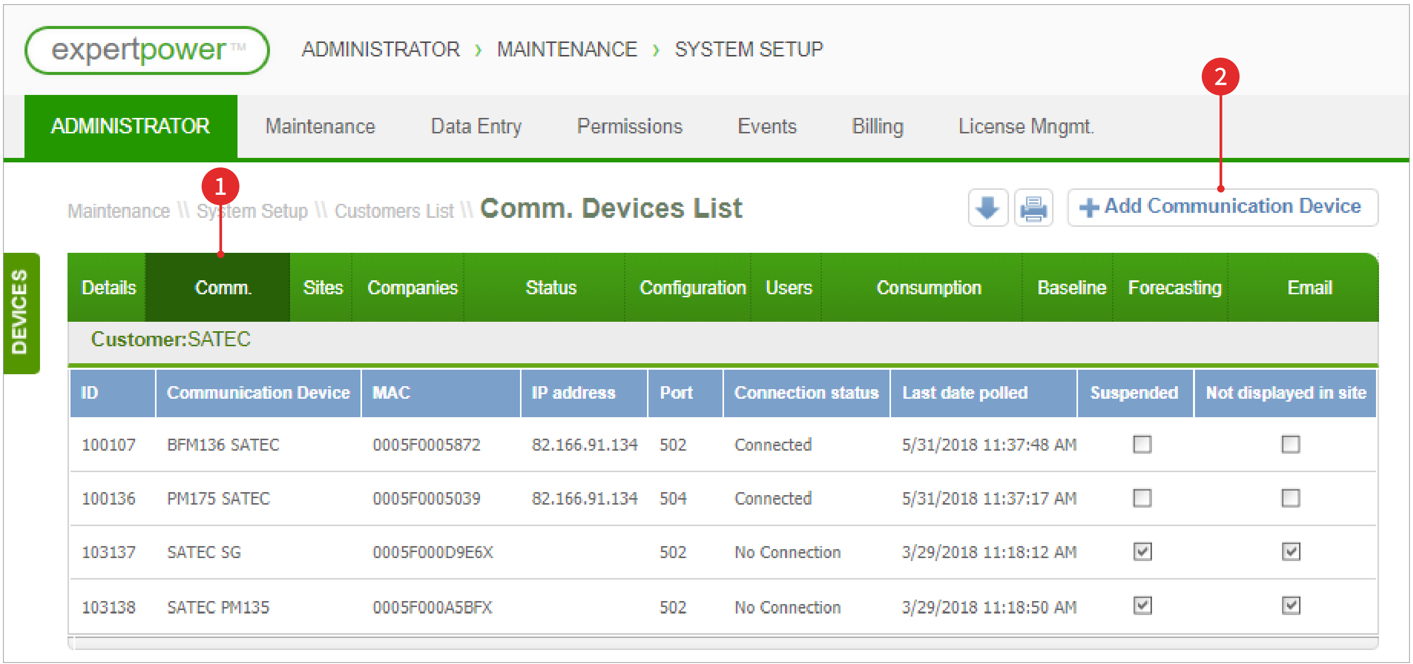
1. Select **Preferences** (1) at the bottom of any of the system screens.
2. Schedule e-mail and SMS messages for each alert level.
3. Click SUBMIT (2).



Add Meter

To add a new meter:

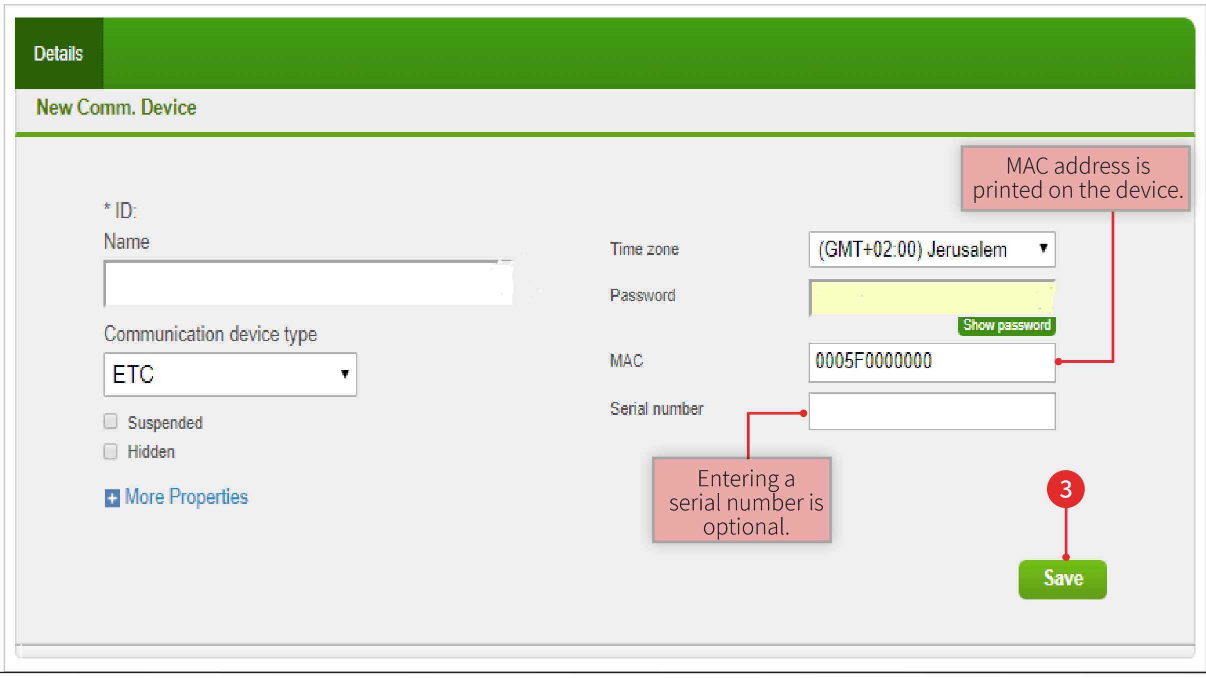
1. Select **System Setup** from the Maintenance menu.
2. Select the desired customer from the list of customers.
3. Select the **Comm.** tab (1).
4. Click + ADD COMMUNICATION DEVICE (2).



The New Comm. Device screen appears. In this screen, enter the following data:

- **ID Name –** a unique name that will aid in identifying the device.
- **Communication device type –** device type is in accordance with the relevant device.
- **Time Zone**
- **Password**
- **MAC –** MAC address appears on the device.

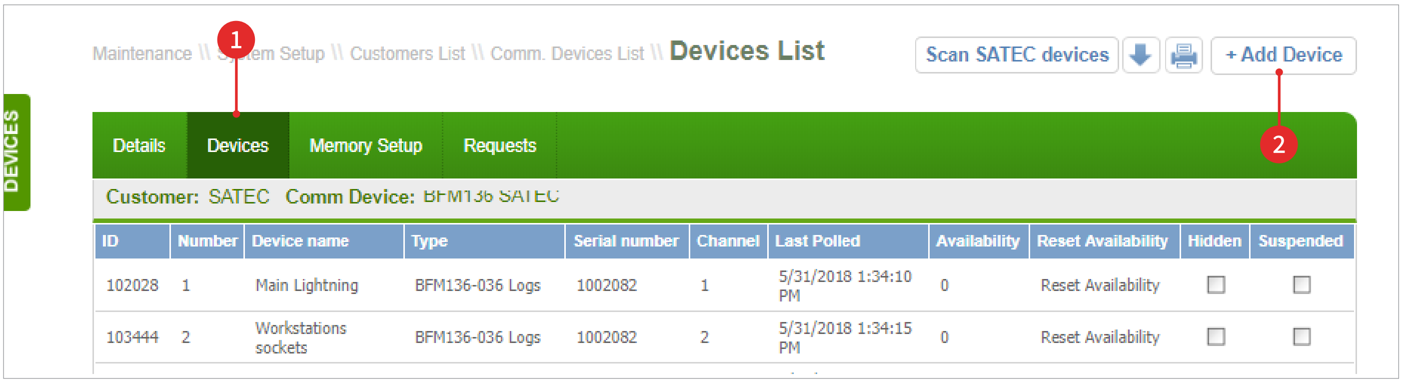
5. Click SAVE (3).



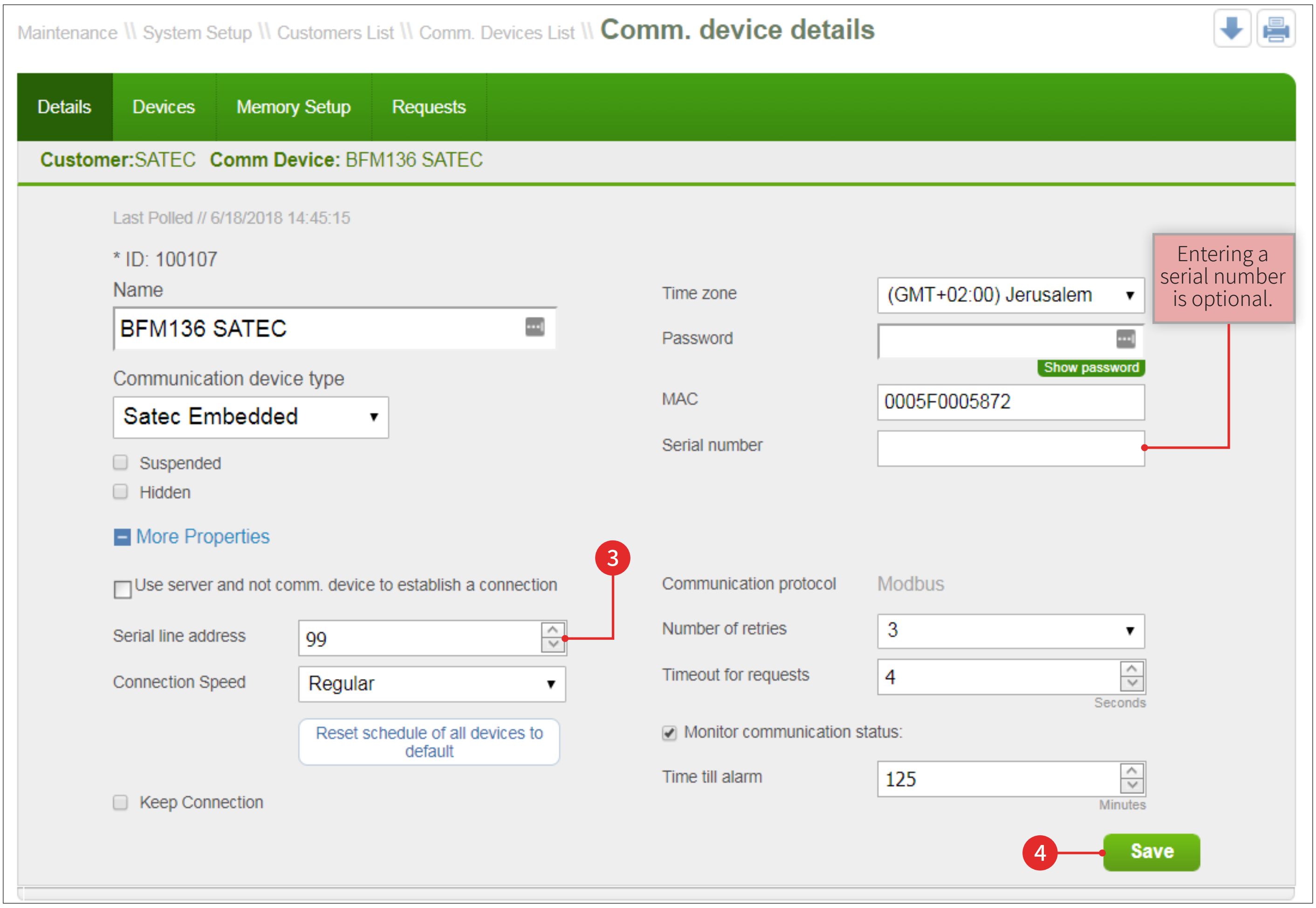
Add a Device

To add a new device:

1. Select **System Setup** from the Maintenance menu.
2. Select the desired customer from the list of customers.
3. Select the **Comm. Devices** tab.
4. Select the desired link in the list of communication devices.
5. Select the **Devices** tab (1).
6. Click **+ Add Device** (2).



7. Set the device parameters.
8. Enter the serial line address number (3).
9. Click **Save** (4).



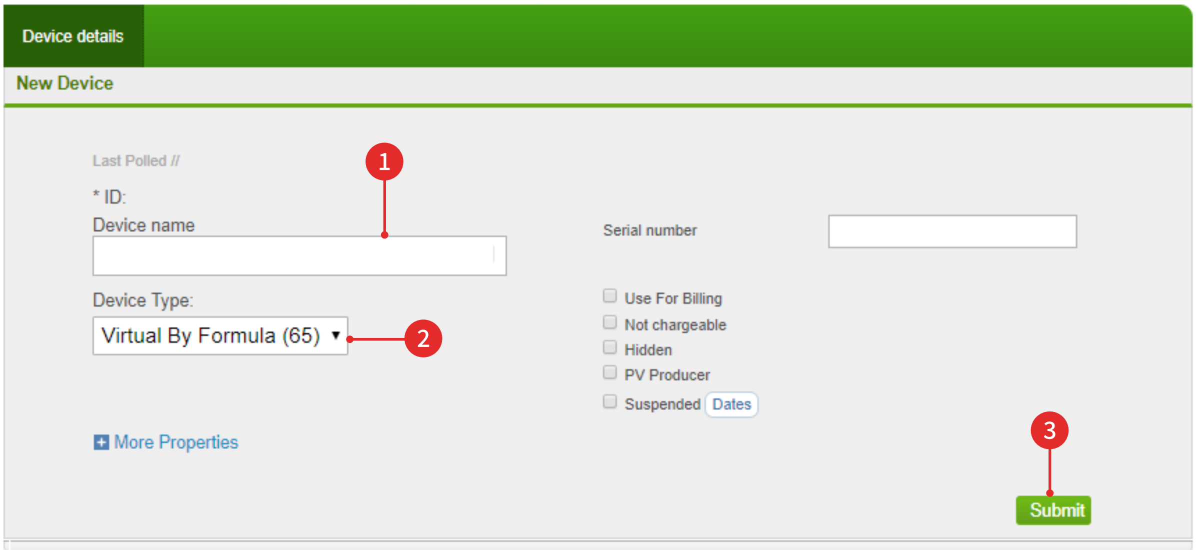
The device now appears both in the communication device lists and in the device tree.

Adding a Calculated Meter

A calculated (virtual) meter applies a formula to multiple devices for billing purposes and for viewing data.

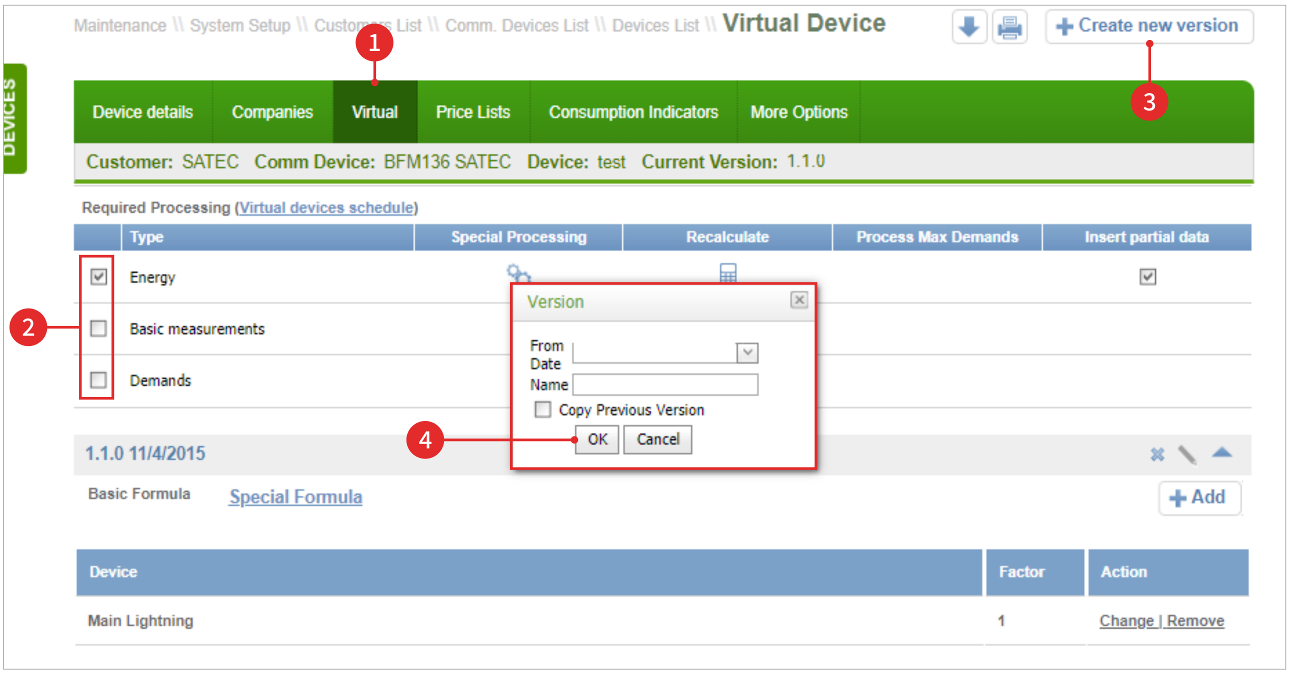
To add a calculated meter

1. Go through steps 1-6 of adding a device (see Add a Device on page 44).
2. Enter a name for the calculated device (1).
3. Select **Virtual By Formula** from the Device Type drop-down menu (2).
4. Click SUBMIT (3).



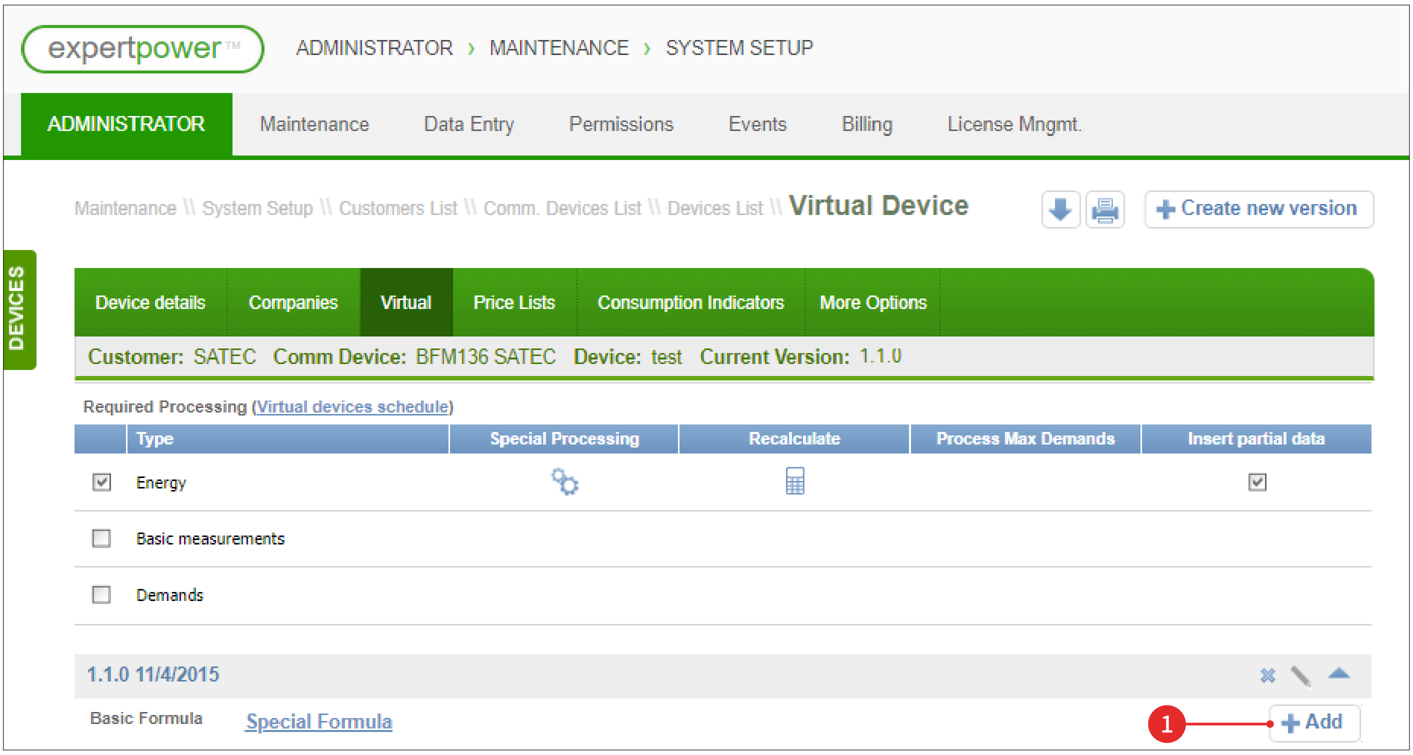
Setting a Virtual Device

1. Click on the virtual device in device list (see Add a Device on page 44).
2. Select the **Virtual** tab (1).
3. Choose device type (2).
4. Click + CREATE NEW VERSION (3).
5. Set a date and name, and click OK (4).



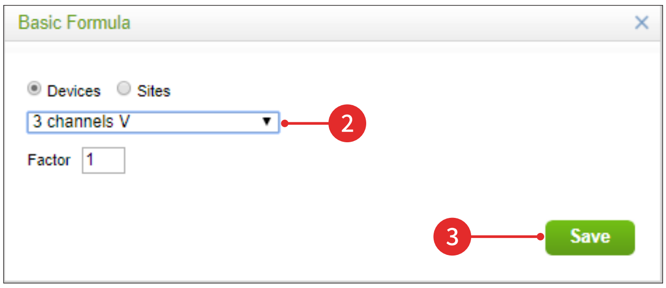
Setting a Formula

1. Click + ADD (1) in the Virtual tab (see Setting a Virtual Device on page 45).



The Basic Formula window opens.

2. Choose the formula from the drop down menu (2) and click SAVE (3).



To add another device, repeat step 1 and select another device in the Basic Formula window.

Written by Galil Technical Communication.