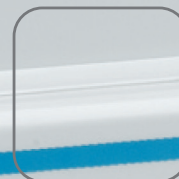


domovea

energy



tebis

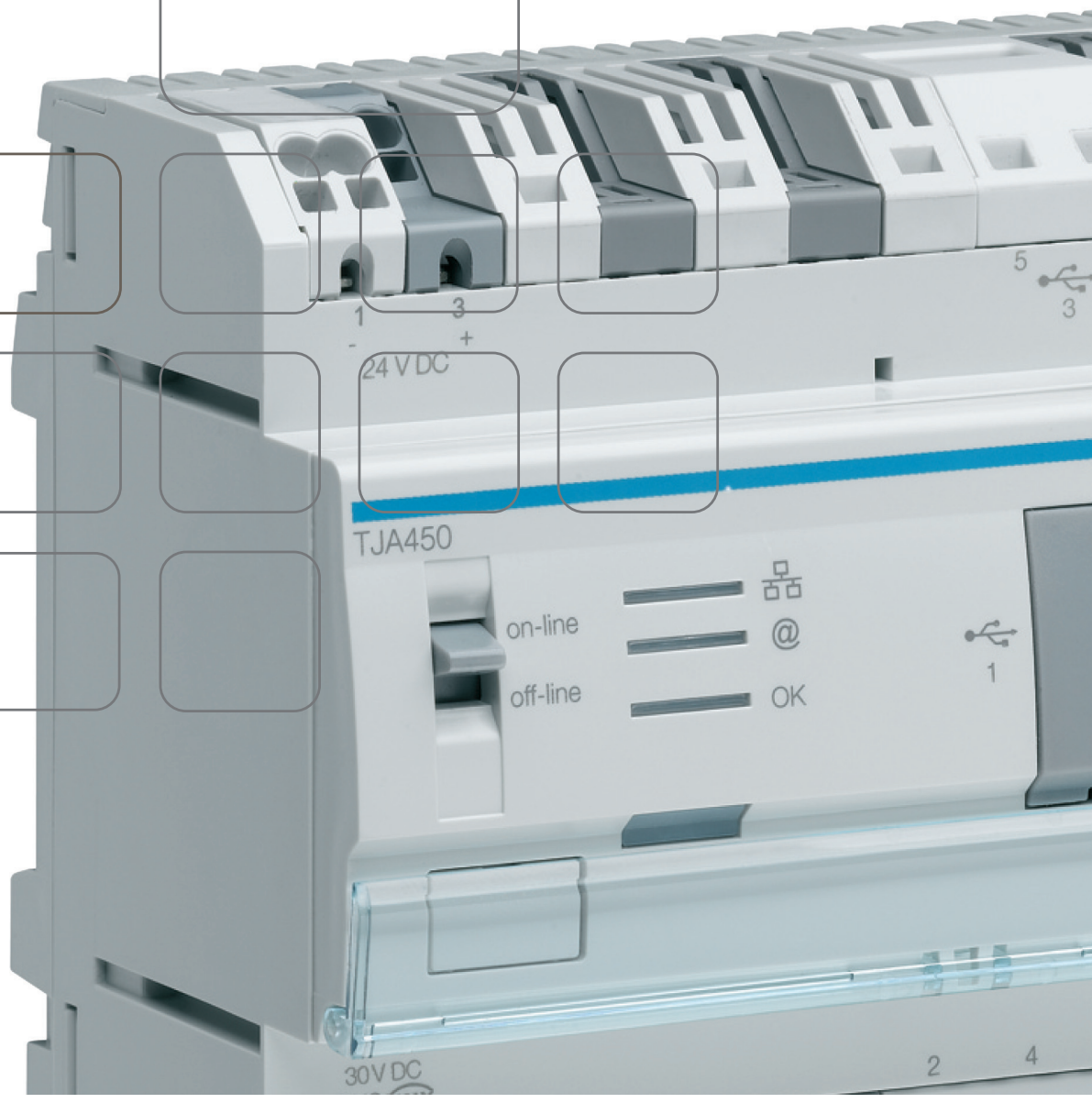


TABLE OF CONTENTS

Page

1.	INTRODUCTION	2
1.1	PURPOSE OF THE DOCUMENT	2
2.	THE ARCHITECTURE OF ELECTRICITY MEASUREMENT	3
2.1	OBJECTS USED FOR MEASUREMENT	3
2.2	HAGER PRODUCTS PROVIDE A MEASUREMENT FUNCTION	4
3.	CONFIGURATION OF ENERGY VIEWING FUNCTIONS.....	6
3.1	CONFIGURATION OF THE ENERGY VIEWING FUNCTIONS	7
3.2	MEASUREMENTS	14
4.	DISPLAY OF ENERGY VIEWING FUNCTIONS	18
4.1	POWER OR OUTPUT INDICATOR SCREEN	18
4.2	CONSUMPTION GRAPH VIEWING SCREEN.....	21
4.3	ENERGY OVERVIEW SCREENS	23
4.4	SETTINGS SCREEN	24
4.5	ENERGY DEVICE IN THE SEQUENCES.....	26
5.	APPENDIX.....	27
5.1	CONFIGURATION EXAMPLE FOR THE TXA306 INPUT MODULE:	27

1. INTRODUCTION

The domovea energy viewing function addresses the increasing desire to reduce energy needs.

Once the different KNX products have acquired the data, they are transmitted to the domovea server through the domovea KNX TP bus.

The software and the domovea server archive these data, which are processed and then displayed on the viewing device (touch screen, laptop computer, etc.)

1.1 PURPOSE OF THE DOCUMENT

The descriptions provided in this manual are intended to familiarize the installer with the domovea system's energy viewing function.

The procedures described in this manual are intended to help the installer to configure and then display the domovea unit's energy viewing functions.

2. THE ARCHITECTURE OF ELECTRICITY MEASUREMENT

2.1 OBJECTS USED FOR MEASUREMENT

In a KNX unit, energy measurements are viewed through communication objects, also called data points. The number and type of these communication objects depend on the product and the acquisition method for the measurement data.

The table below describes the various measurement objects available in the KNX Hager products.

Tool name	Size	Datapoint Identification	Unit	Comment
Instantaneous power	4 bytes	DPT 14.056	W	/
Active energy	4 bytes	DPT 13.010	Wh	/
Tariff selection	1 byte	DPT 5.006	/	See table below for an explanation of the values by country of installation
Active energy tariff	6 bytes	DPT 235.001	/	Contains DPTs 13.010 et 5.006 + 1 byte of data validation
Electric meter value	4 bytes	DPT 12.001	/	/
Volume	4 bytes	DPT 14.076	/	/
Output	4 bytes	DPT 14.077	/	/

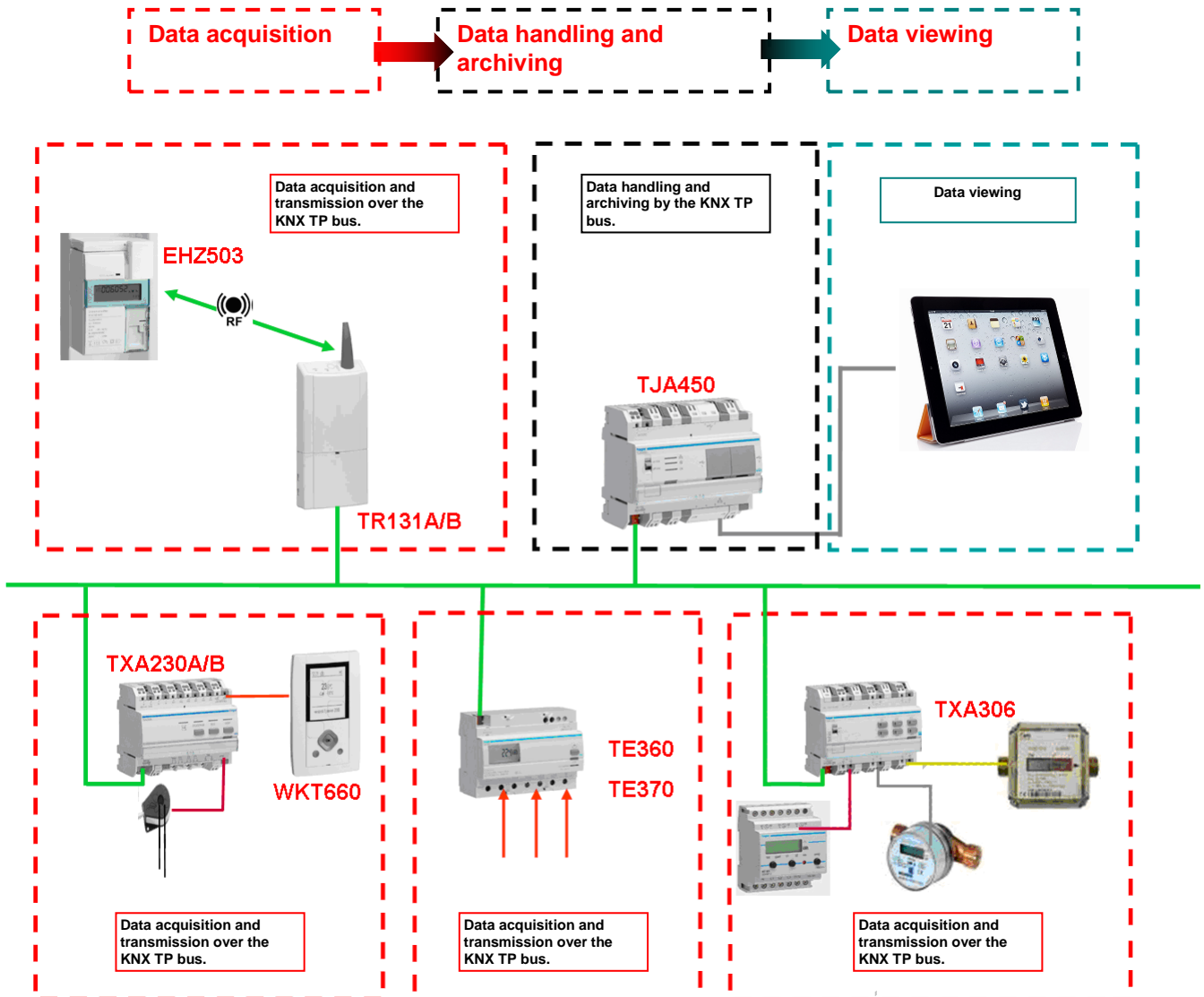
Tool values by Tariff	Interpretation of the Tariff for France	Interpretation of the Tariff for Germany
0	Base	No tariff
1	Off-peak period	Tariff 1
2	Peak period	Tariff 2
3	Peak day withdrawal – normal day	/
4	Peak day withdrawal – sliding peak period	/
5	Blue period – Off-peak	/
6	White period – Off-peak	/
7	Red period – Off-peak	/
8	Blue period – Peak	/
9	White period – Peak	/
10	Red period – Peak	/

2.2 HAGER PRODUCTS PROVIDE A MEASUREMENT FUNCTION

The table below provides the list of KNX Hager Products that allow energy measurement data to be captured:

Product Reference	KNX Interface	Measurement Type	Objects Available	Data point Identification
TE360	TP	Direct: series connection to the circuit to be monitored	Instantaneous power	DPT 14.056
			Active energy	DPT 13.010
			Tariff selection	DPT 5.006
TE370	TP	Direct: connection of a current transformer to the circuit to be monitored	Instantaneous power	DPT 14.056
			Active energy	DPT 13.010
			Reactive energy	DPT 13.012
			Tariff selection	DPT 5.006
TXA306	TP	Indirect: checks the measurement pulses emitted by an electric meter	Electric meter value	DPT 12.001
WKT660 + TXA230A/ TXA230B	TP	Direct: connection of a current transformer to the circuit to be monitored	Instantaneous power	DPT 14.056
			Active energy	DPT 13.010
			Tariff selection	DPT 5.006
			Active energy tariff	DPT 235.001
EHZ503 + TR131A/B	RF => TP	Indirect: Installation of a "cap" on the eHZ counter that converts the infrared pulses into measurements	Instantaneous power	DPT 14.056
			Tariff selection	DPT 5.006
			Active energy tariff	DPT 235.001
TE330	TP	Direct: connection of a current transformer to the circuit to be monitored	Instantaneous power	DPT 14.056
			Active energy	DPT 13.010
			Tariff selection	DPT 5.006
			Active energy tariff	DPT 235.001
TYC701E	TP	Indirect: checks the measurement pulses emitted by an electric meter.	Output and volume (4 bytes)	DPT 14.076 DPT 14.077
TYC702E	TP	Indirect: checks the measurement pulses emitted by an electric meter.	Output and volume (4 bytes)	DPT 14.076 DPT 14.077

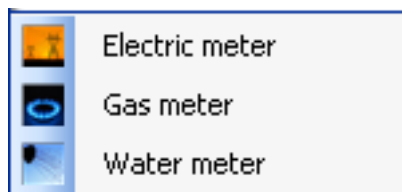
The diagram below summarizes the overall architecture of the domovea system's energy viewing function.



3. CONFIGURATION OF ENERGY VIEWING FUNCTIONS

Three Energy management devices are available in the domovea configurator:

- **Electric meter:** Device that measures electrical energy and power.
- **Gas meter:** Device that measures the flow and volume of gas.
- **Water meter:** Device that measures the flow and volume of water.

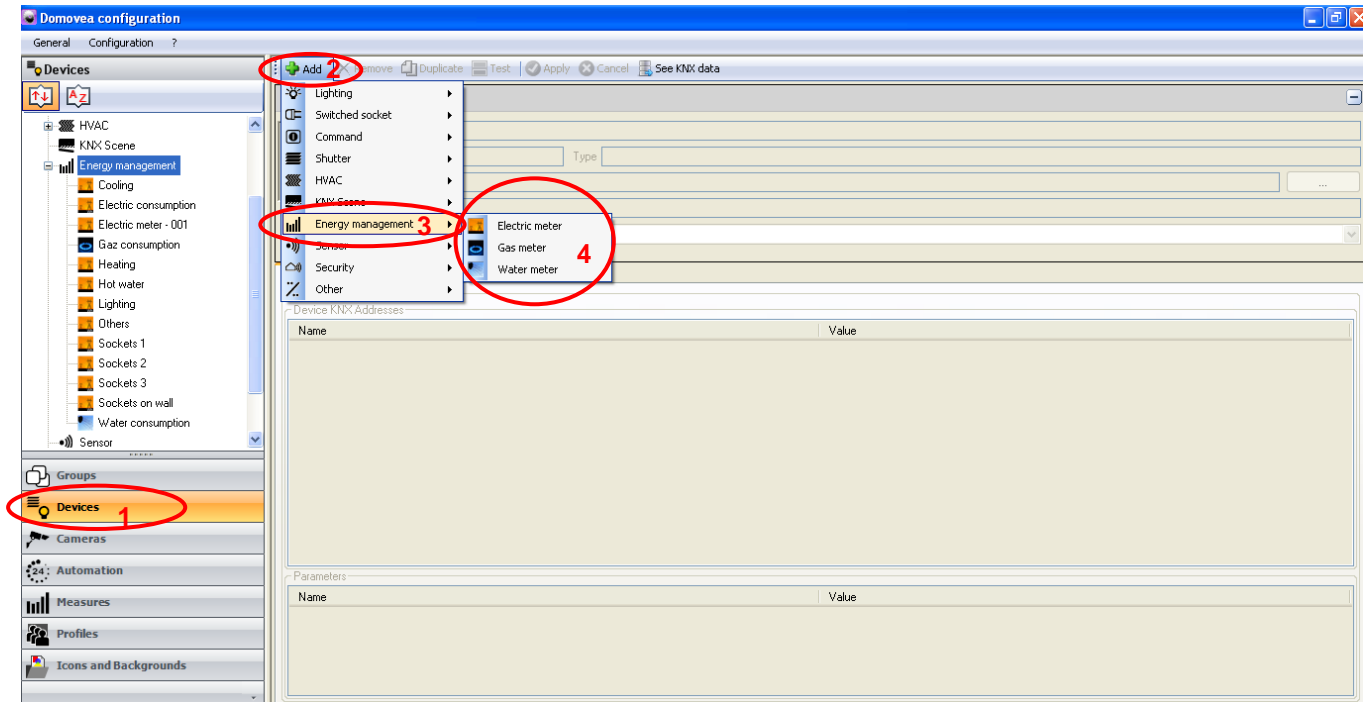


3.1 CONFIGURATION OF THE ENERGY VIEWING FUNCTIONS

To add energy viewing:

Click on **Devices** (1) in the list of tabs,

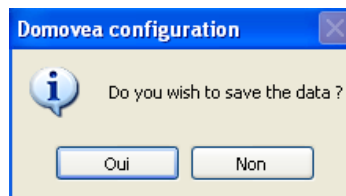
Click on **Add** (2) in the menu bar, then on **Energy management** (3), and on the type of device desired (4).



To enable domovea to provide the displays or perform energy data comparisons between periods, it is necessary to create an archive of the values measured.

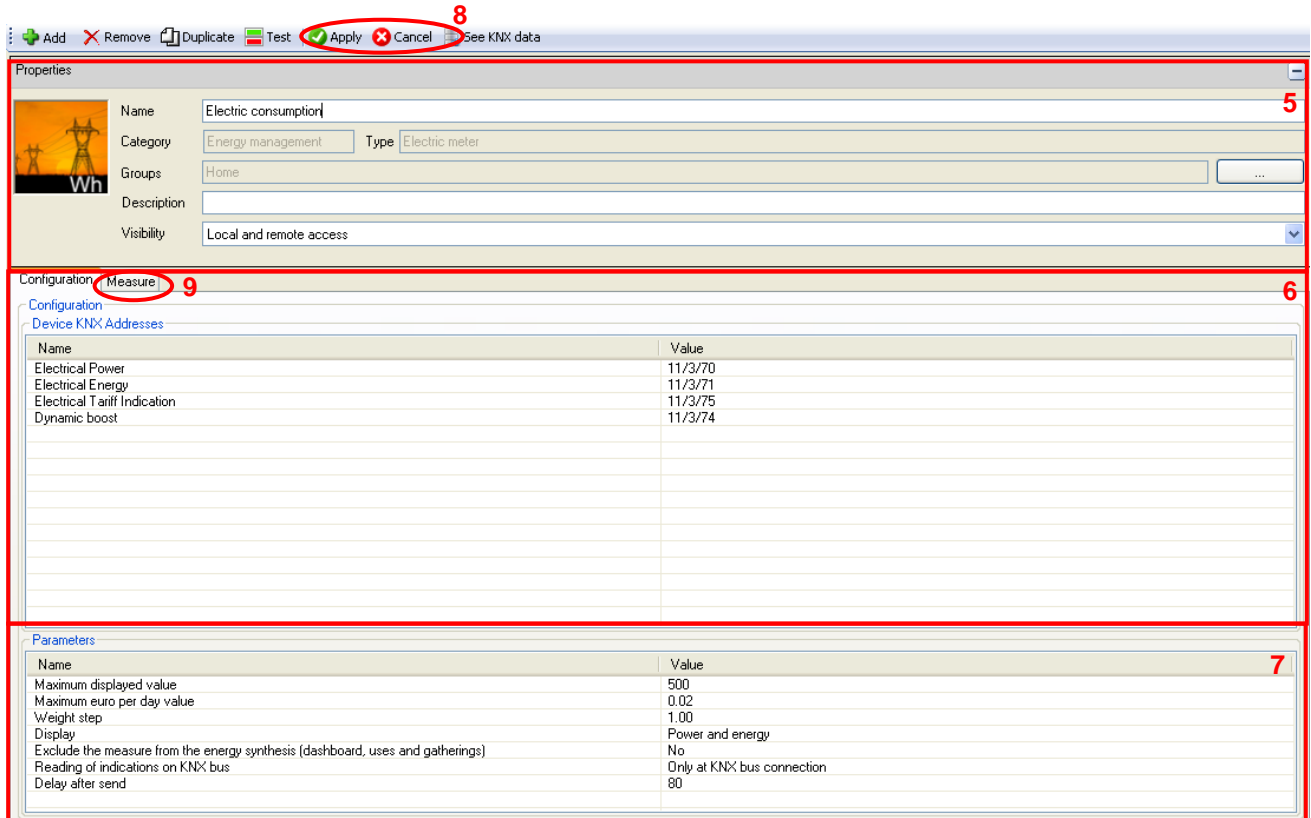
Thus the Domovea configuration module invites the user to set a measurement for this device.

The following window will be displayed:



Click **Yes** to create the archive or **No** to cancel.

The device is added to the list of devices and the following screen is displayed:



Properties

Name: Electric consumption

Category: Energy management Type: Electric meter

Groups: Home

Description:

Visibility: Local and remote access

Configuration

Measure

Device KNX Addresses

Name	Value
Electrical Power	11/3/70
Electrical Energy	11/3/71
Electrical Tariff Indication	11/3/75
Dynamic boost	11/3/74

Parameters

Name	Value
Maximum displayed value	500
Maximum euro per day value	0.02
Weight step	1.00
Display	Power and energy
Exclude the measure from the energy synthesis (dashboard, uses and gatherings)	No
Reading of indications on KNX bus	Only at KNX bus connection
Delay after send	80

The device's properties can be customized (5), by defining the following attributes:

Name: Allows the name to be defined.

Groups: Allows the group to which the device is associated to be defined.

Description: Allows the device to be described in more detail.

Visibility: Allows the device's visibility to be defined.

Local and remote access: Allows access to the device with the domovea client and via the domovea.com web portal.

Local access: Allows access to the device with the domovea client only.

No access: Prevents access to the device with the domovea client and through the domovea.com web portal.

3.1.1 COMMON SETTINGS

- **Exclude the measurement of energy overview (dashboard, usage and grouping):** Allows the exclusion of calculated measurements (dashboard and energy overview).

Possible values: Yes - No

Default value: No

- **Reading of indications on KNX bus: Defines the frequency that the status indications on the KNX bus are read.**

Default values: During connection to the bus only

Possible values:

- During connection to the bus only
- Every minute (Risk of overloading the bus)
- 2 minutes (Risk of overloading the bus)
- 3 minutes
- 5 minutes
- 10 minutes
- 15 minutes
- 30 minutes
- 45 minutes
- 1 hour
- 2 hours
- 3 hours
- 5 hours
- 12 hours
- 24 hours
- Every day
- Never

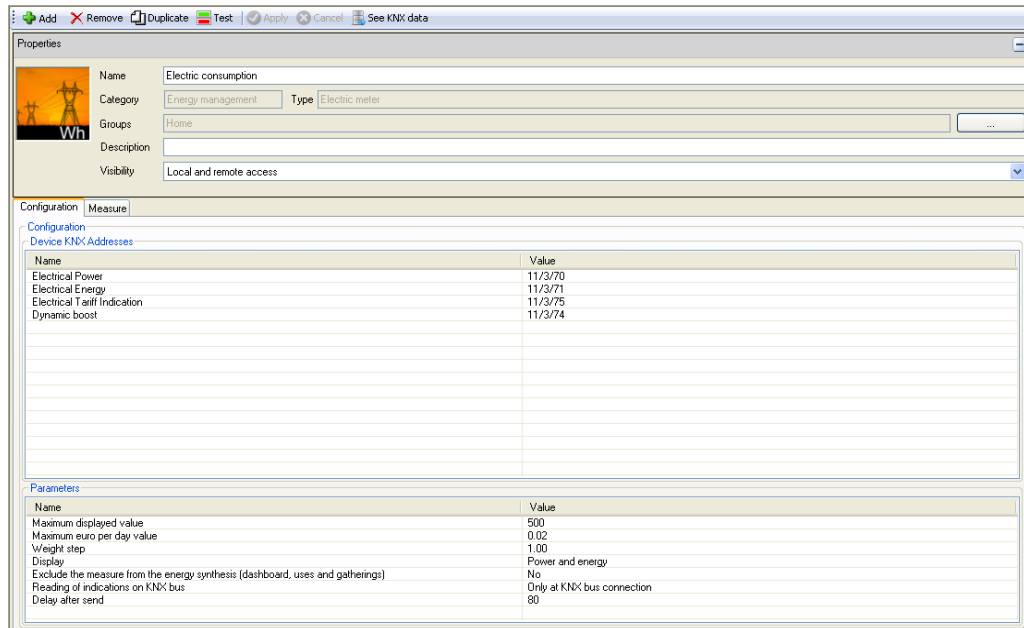
- **Delay after send: Defines the time period after which the objects are sent.**

Possible values: 0 - 400 ms

Default value: 80 ms

3.1.2 ELECTRIC METER

Settings



The screenshot shows the configuration window for an electric meter. The 'Properties' section includes:

- Name: Electric consumption
- Category: Energy management
- Type: Electric meter
- Groups: Home
- Description: (empty)
- Visibility: Local and remote access

The 'Configuration' section has two tabs: 'Configuration' and 'Measure'. The 'Configuration' tab is active, showing two tables:

Device KNX Addresses	
Name	Value
Electrical Power	11/3/70
Electrical Energy	11/3/71
Electrical Tariff Indication	11/3/75
Dynamic boost	11/3/74

Parameters	
Name	Value
Maximum displayed value	500
Maximum euro per day value	0.02
Weight step	1.00
Display	Power and energy
Exclude the measure from the energy synthesis (dashboard, uses and gatherings)	No
Reading of indications on KNX bus	Only at KNX bus connection
Delay after send	80

Device KNX addresses:

- **Electrical Power:** Displays the value of the electrical power consumed (in W).
- **Electrical Energy:** Displays the value for the electricity consumed (in kWh).
- **Electrical Tariff indicator:** Displays the current tariff.
- **Dynamic boost:** Forces sending mode for the electrical power value for a faster update of the value. This feature remains active for the time period set in ETS.

Settings:

- **Maximum displayed value:** Defines the upper limit for the meter displaying electrical power.
Possible values: 100 - 100,000 W
Default value: 10,000 W
- **Maximum euro per day value:** Defines the alert threshold above which the electric consumption indicator emits a warning that it has been exceeded.
Possible values: €0 – 100,000/day
Default value: €100 /day
- **Weight step:** Modify if using a pulse meter.
Defines the value of a pulse rate (in m³) depending on the value given by the meter (for example : 1 pulse per 10m³).
Possible values: 0 – 100 (resolution : 0.01)
Default value: 1
- **Display:** Drop-down list with choice of:
 - Power only (curve)
 - Energy only (tachometer)
 - Power and energy (curve and tachometer)

Default value: Power and energy.

- **Leak threshold alert time:** Monitoring time during which consumption must have been zero at least once.

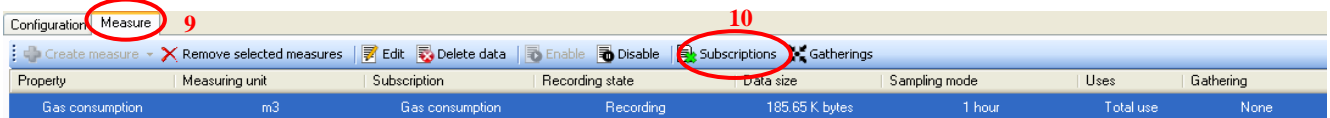
Possible values :

- 1 minute
- 2 minutes
- 3 minutes
- 5 minutes
- 10 minutes
- 15 minutes
- 30 minutes
- 45 minutes
- 1 hour
- 2 hours
- 3 hours
- 5 hours
- 12 hours
- 1 day
- Not used

Default value: Not used.

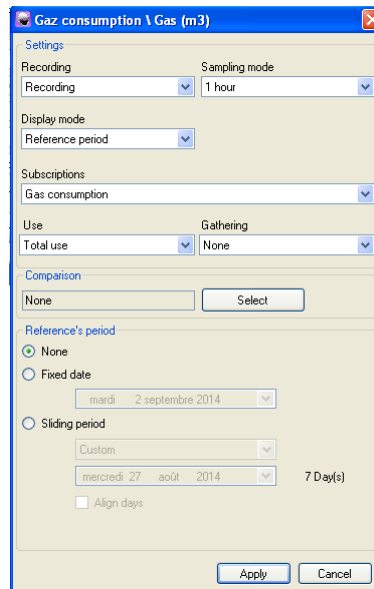
3.2 MEASUREMENTS

Click on the **Measure** tab (9). The following screen will be displayed, allowing the device's measurement archive to be displayed:



The following commands are available:

- **Create measure:** Allows the measure archive to be created after the measure type is selected.
- **Remove selected measures:** Allows the measure archive to be deleted after confirmation.
- **Delete data:** Allows the measure archive to be deleted after confirmation.
- **Enable:** Enables the recording of measures in the archive.
- **Disable:** Disables the recording of measures in the archive.
- **Edit:** Allows the characteristics of the measure archive to be modified. After left-clicking on this button, the following window is displayed:



The parameters of the measure archive may be modified:

- **Recording:** Enables data recording to be enabled or disabled.
Default value: Active
Possible values: Active or Inactive

- **Sampling mode:** Allows the frequency of measure recording to be set.
Default value: 5 minutes
Possible values:
 - Per event: for each value received on the communication tool
 - 1 minute
 - 2 minutes
 - 3 minutes
 - 5 minutes
 - 10 minutes
 - 15 minutes
 - 30 minutes
 - 45 minutes
 - 1 hour
 - 2 hours
 - 3 hours
 - 5 hours
 - 12 hours
 - 1 day


- **Subscriptions:** Allows the type of subscription to be selected and the relevant tariff applied to the measure to be configured (see Subscriptions).

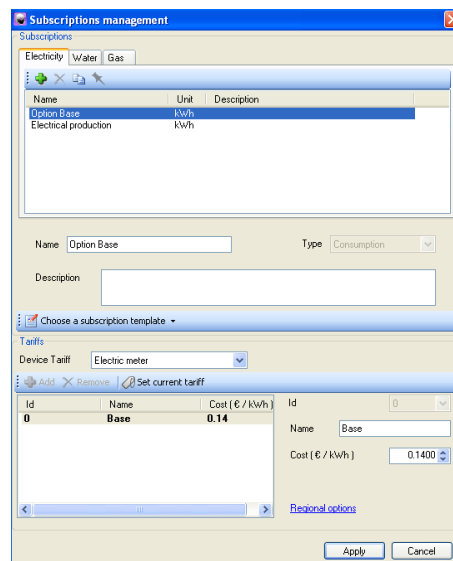
- **Reference period:** Enables a reference period to be defined to determine usage history and trends displayed on the domovea client.
Possible values:
 - **None:** No history or trends will be displayed.
 - **Fixed date:** The history and trends will be calculated based on a defined fixed date.
 - **Sliding period:** The history and trends will be calculated based on a defined time period:
 - *Day:* Calculated in comparison with the previous day.
 - *Week:* Calculated in comparison with the previous week.
 - *Month:* Calculated in comparison with the previous month.
 - *Year:* Calculated in comparison with the previous year.
 - *Customized:* Calculated in comparison with a time period starting on the selected date and ending the day prior to the current date.
Example: If the current date is June 24, 2011 and the selected date is June 17, 2011, the histories and trends will be calculated in comparison with the period from June 17-23, 2011.

- **Align days:** Allows equivalent weekdays to be compared over the selected reference period.

- Subscriptions (10):

A defined subscription for the cost of electricity for one unit. It is made up of one or more tariffs that give the cost of electricity for a given time period (day, hour, etc.)

Click on the Subscriptions button . The subscriptions management window will be displayed.

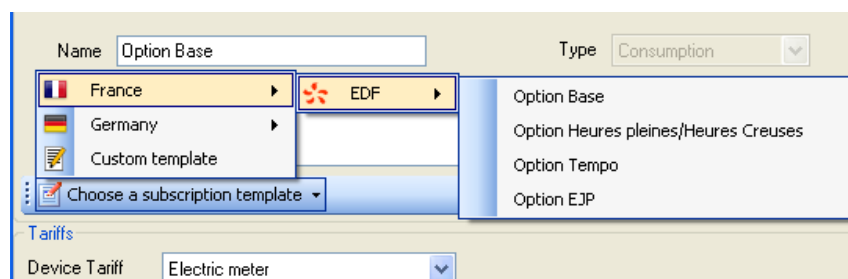


The subscription management parameters and tariffs can be adjusted:

- **Choose a subscription template:** Enables the type of electricity subscription to be selected for the unit.

The subscription option may be selected from a list or customized.

Several different subscriptions can be created and these can be allocated to several different measurements.



- **Description:** Allows the subscription to be described in more detail.
- **Device Tariff:** Electrical energy only (using a device that is capable of detecting the current tariff). Selects the device that manages the tariff changes for the electrical unit.

- Depending on the type of subscription selected, a list of tariffs is displayed in the rate management window. The following commands and parameters are available:
 - *Add*: Enables a tariff to be added (only available for customized subscriptions).
 - *Remove*: Enables a tariff to be deleted (only available for customized subscriptions).
 - *Set current tariff*: Enables the selected tariff to be set as the current tariff for the unit (this tariff will be shown in bold in the tariff management window).
 - *Id*: Defines the Tariff tool that activates the selected tariff (only available for customized subscriptions)
 - *Name*: Allows the tariff to be described in more detail.
 - *Cost (€/ kWh)*: Enables the kWh tariff to be defined.
 - *Currency configuration*: Enables the currency being used to be configured.
 - *Gas conversion coefficient* Represents the quantity of energy (in kWh) contained within one m³ of natural gas. This coefficient varies according to the altitude and composition of the gas, and may be found on the gas provider's bill.
 - *Apply*: Saves changes.
 - *Cancel*: Discards any changes.

Tariff modifiable per sequence

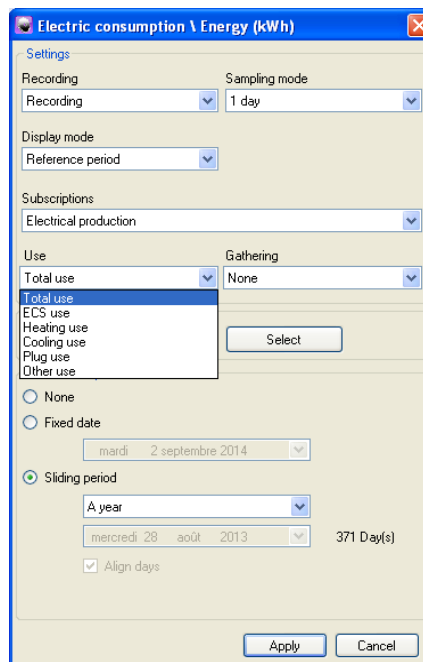
The choice of tariff can also be defined using a sequence according to an event (button) or a time range (see domovea instructions on Automation). In this case, it is the user who chooses the tariff to be applied.

- Uses or gatherings:

Uses and combinations allow several meters to be added or deleted (for example, ground-floor readings and upper level readings).

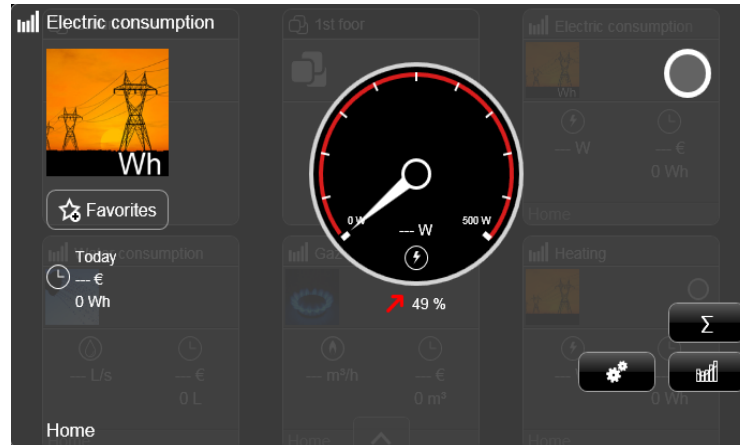
- As the uses are predefined (RT2012 uses), it is not possible to change their names or icons.
- Gatherings may be created, modified and deleted in the configurator.

As each measurement may relate to a use and/or a combination, Domovea automatically calculates the total for the use or the gathering.



4. DISPLAY OF ENERGY VIEWING FUNCTIONS

4.1 POWER OR OUTPUT INDICATOR SCREEN



The screen is made up of five sections:

- **The instantaneous power or output indicator:**



- The instantaneous power (or flow) is indicated by the instant power indicator needle, and directly by the value displayed under the needle.
- The maximum value is defined either in the domovea configurator or on the settings screen of the consumption indicator. It is indicated above the last graduation.
- The alert threshold corresponds to the beginning of the red zone on the consumption indicator. It is defined either in the domovea configurator or on the electric meter settings screen. It is determined based on the current tariff.
- If using a compatible device (electrical energy only), pressing the indicator or the gray zone surrounding it will cause the “Dynamic boost” tool to be sent to the electric meter associated with the device.

- **Trends :**

A trend is calculated based on consumption data.

It is a result of the comparison between:

- "Tachometer": the day's data and the previous day's data.
- "Curves": the current period data and the reference period data.

The system compares the data using equivalent ending times.

For example,

- *In a day view chart, if it is 3pm, the usage for the day is compared to the usage for the previous day up to 3pm.*
- *In a year view chart, if it is the month of March, the usage for the year is compared to the usage for the previous year up to the month of March.*

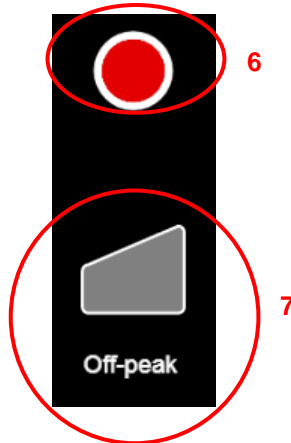
The result is displayed as a percentage. Trends are low if under -2%, high if over 2% and stable if between the two.

- **Daily consumption:**



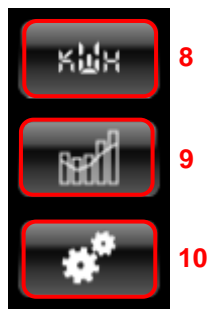
- **Daily energy consumption** (4) displays the amount of energy consumed between 12:00am and the current time, indicated in Wh or kWh.
- **The daily energy cost** (5) displays the cost of the energy consumed between 12:00am and the current time, indicated as a monetary value.

- **Indicators:**



- **Leak or Threshold Exceeded indicator** (6) (see §.4.3).
- **Tariff indicator** (7) indicates the tariff type currently being applied to the device, and allows the viewed tariff type to be selected.

- **Buttons:**



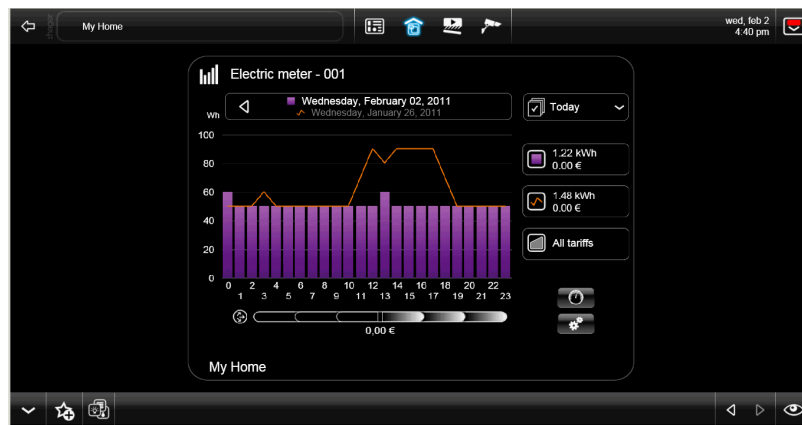
- Pressing the **Consumption** button (8) displays:
 - The unit's total energy consumption in kWh since the electric meter was installed.
 - The total energy consumption in kWh at the most expensive tariff.
 - The total energy consumption in kWh at the other tariffs.



- Pressing the **View history** button (9) displays the device's energy consumption history (see §.4.2).
- Pressing the **Parameters** button (10) displays the configuration window for the viewing screens (see §.4.3).

4.2 CONSUMPTION GRAPH VIEWING SCREEN

- **Type of data displayed:**
 - The energy consumption for the current period is displayed as a pink histogram.
 - The energy consumption for the reference period is represented as an orange curve. The units on the horizontal axis depend on the period selected.
- **Examples of displays based on the current type of period:**
 - Example of a single tariff daily graph:



- Example of a multi tariff daily graph:



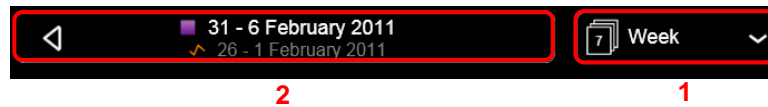
For multi tariff subscriptions, the most expensive tariff may be identified with a gray background. The other tariffs cannot be identified.

- Example of a weekly graph:



- **Buttons:**

- Select current period:



- The **Select period type** button (1) allows the user to select the current period type (Today, Day, Week, Month or Year) using the arrow on the right.
- The **Select period** button (2) allows the user to select the period to be displayed, using the arrows on the left or right.

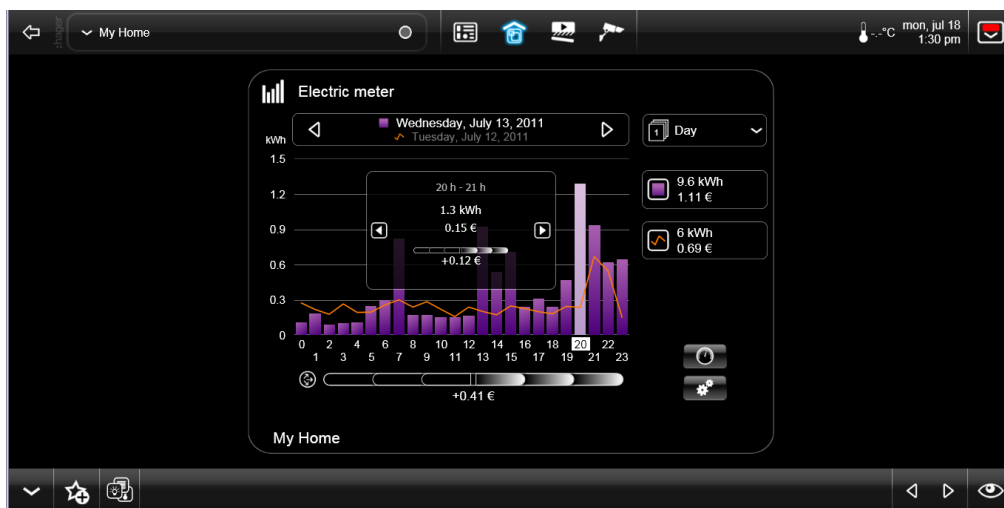
- Select the data displayed:



- Pressing the **Current consumption** button (3) shows or hides the energy consumption histogram for the current period.
- Pressing the **Reference period consumption** button (4) shows or hides the energy consumption curve for the reference period.
- Pressing the **All tariffs** button (5) allows the user to select the tariffs to be used to calculate consumption for the current and reference periods.

- **Detailed view of consumption:**

Clicking on a bar in the histogram displays the consumption details for part of the selected consumption period.



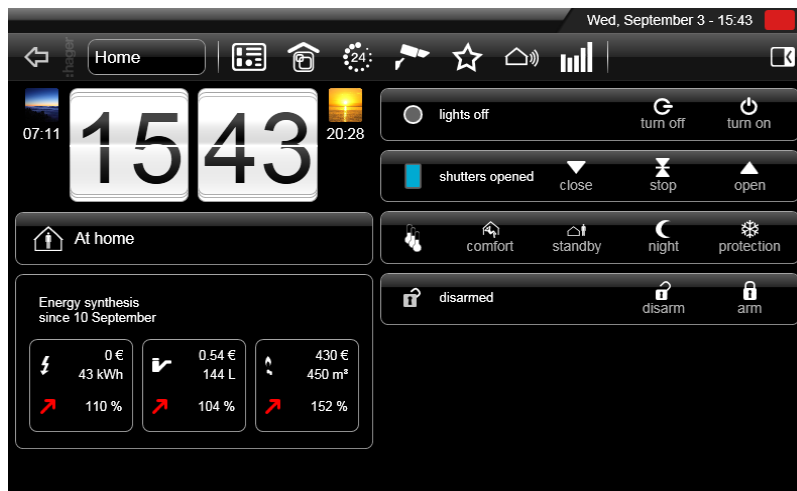
4.3 ENERGY OVERVIEW SCREENS

4.3.1 DASHBOARD

The dashboard includes an "energy" widget. This energy widget is displayed instead of the cameras (dynamic display) if it is activated in the profile settings.

It allows the total usage for each of the consumables (electricity, water, gas) to be displayed.

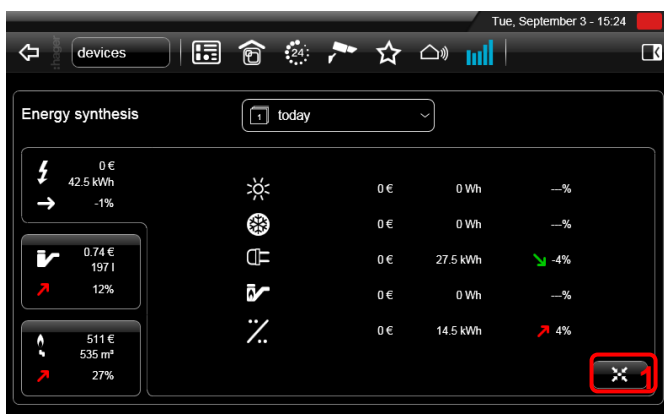
NOTE: The periods in which these measurements are displayed may be modified in the energy overview display (see following chapter).



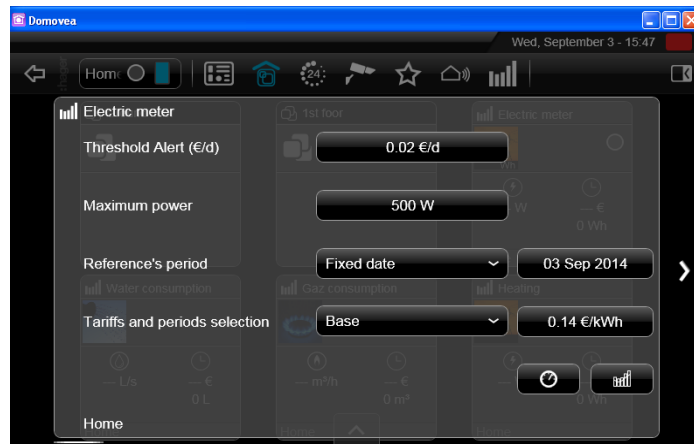
4.3.2 ENERGY SYNTHESIS

The energy synthesis gathers all the data of the uses and gatherings; you can switch between the modes for uses and gatherings using the button (1).

The display period may be changed using the period selection button (2).



4.4 SETTINGS SCREEN



- **Threshold:**

- Click on **Threshold Alert (€/d)** to define the threshold alert above which the electricity consumption indicator would emit a warning that it had been exceeded.
The threshold may be defined either by using the + / - (1) or by clicking on the calculator button (2) to enter the figure directly using the calculator keypad.
- Click on **OK / apply** to confirm the changes or **cancel** to discard the changes.



- **Maximum:**

- Click on **Maximum power** to set the upper limit for the electricity consumption indicator (3).
The threshold can be adjusted using the + / - buttons (4).



- Click on **apply** to confirm the changes or **cancel** to discard the changes.

- **Mode:**

- Click **Mode** to set the reference period type.
Possible values:
 - **None**: No history or trends will be displayed.
 - **Fixed date**: The history and trends will be calculated based on a defined fixed date.
 - **Sliding period**: The history and trends will be calculated based on a defined time period.
- Click on **apply** to confirm the changes or **cancel** to discard the changes.

- **Date:** (only available in fixed date mode)

- Click on **Date** to set the date for the reference day.
- Click on **apply** to confirm the changes or **cancel** to discard the changes.

- **Interval:** (only available in rolling date mode)

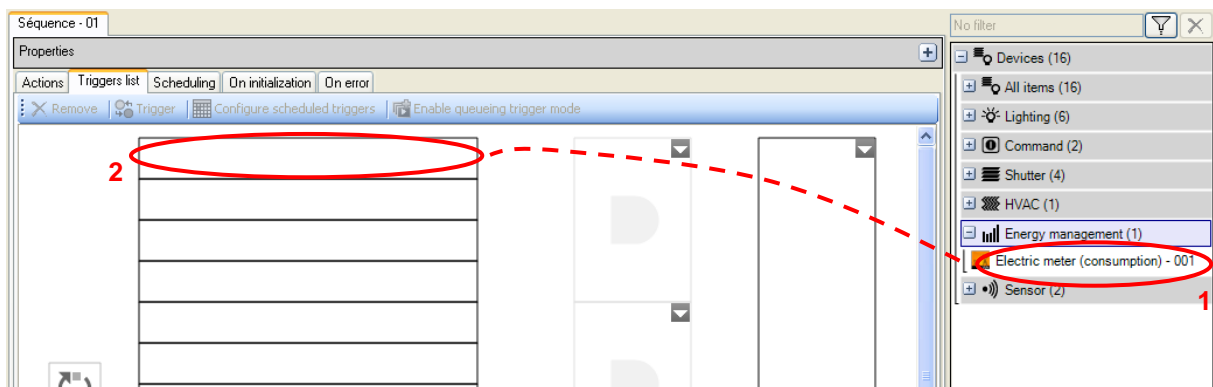
- Click on **Interval** to select the reference period type and start date.
Possible values:
 - **Day**: Displays consumption in comparison with the previous day.
 - **Week**: Displays consumption in comparison with the previous week.
 - **Month**: Displays consumption in comparison with the previous month.
 - **Year**: Displays consumption in comparison with the previous year.
 - **Customized**: Displays consumption in comparison with a time period starting on the selected date and ending the day prior to the current date.
Example: If the current date is June 24, 2011 and the selected date is June 17, 2011, the histories and trends will be calculated in comparison with the period from June 17-23, 2011.
 - **Align days**: Allows equivalent weekdays to be compared over the selected reference period.
- Click on **apply** to confirm the changes or **cancel** to discard the changes.

4.5 ENERGY DEVICE IN THE SEQUENCES

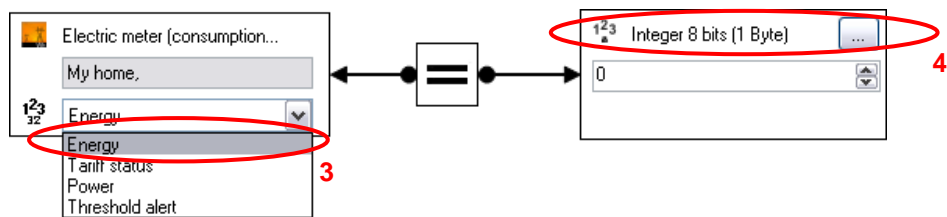
Used to include an energy device in the triggers list for a sequence.

Example: Shut down the water heater or the swimming pool heating when the energy consumed exceeds a certain threshold.

- Add **an event for a device** in the triggers list for a sequence (see domovea's instructions on Automation),
- Select **Devices** from the list,
- Develop the **Energy Management** unit
- Select the **Counter** device (1) and drag and drop this device to the field **Drag a device** (2) in the trigger configuration.



- Select the object to be used from the left operand (3),
- Select the variable type from the right operand (4).



5. APPENDIX

5.1 CONFIGURATION EXAMPLE FOR THE TXA306 INPUT MODULE:

Metering input 1		
Impuls counting	4 bytes	Not a determining factor for the metering
Initial counter value	0	Configuration obligatory: do not modify
Intermediate threshold	1	Not a determining factor for the metering
Main threshold	10000000	Not a determining factor for the metering
Active edge	Rising edge	Configuration obligatory: do not modify
Counting step	1	Configuration obligatory: do not modify
Number of impuls (es) for 1 counting step	1	Configuration obligatory: do not modify
Periodical emission of the counter value	Periodical emission (Time)	Configuration to be done according to your system
Time interval	1 h	Configuration to be done according to your system
Object polarity if threshold reached/exceeded	1	Not a determining factor for the metering
Hours counter mode	Increment	Configuration obligatory: do not modify
Emission of intermediate threshold object	Not used	Not a determining factor for the metering
Emission of main threshold object	Not used	Not a determining factor for the metering
Counter value management if main threshold reached	Continue counting	Configuration obligatory: do not modify
Emission of counter value if intermediate threshold reached or exceeded	Not used	Not a determining factor for the metering
Emission of counter value if main threshold reached or exceeded	Not used	Not a determining factor for the metering
Emission of counter value after initialization	Not used	Not a determining factor for the metering
Meter behaviour if maximal counter value reached	If threshold reached, reset counter at start value	Configuration obligatory: do not modify
Emission of counter value at bus return	Not used	Not a determining factor for the metering
Threshold and initial counter value modification through objects	Not used	Not a determining factor for the metering
Meter reset after download	Not used	Configuration obligatory: do not modify

Settings to be made:

- **Periodical emission of the counter value:** Used to define the periodical emission mode.
Possible values: None – Periodical emission (Value) – Periodical emission (Time)
Default value: Periodical emission (Time)
- **Time interval:** Used to define the time interval between each emission according to the energy type.
Default value: 1h
Possible values: 1s, 2s, 3s, 4s, 5s, 10s, 20s, 30s, 1min, 2min, 3min, 4min, 5min, 10min, 15min, 30min, 1h, 2h, 3h, 6h, 12h, 24h.