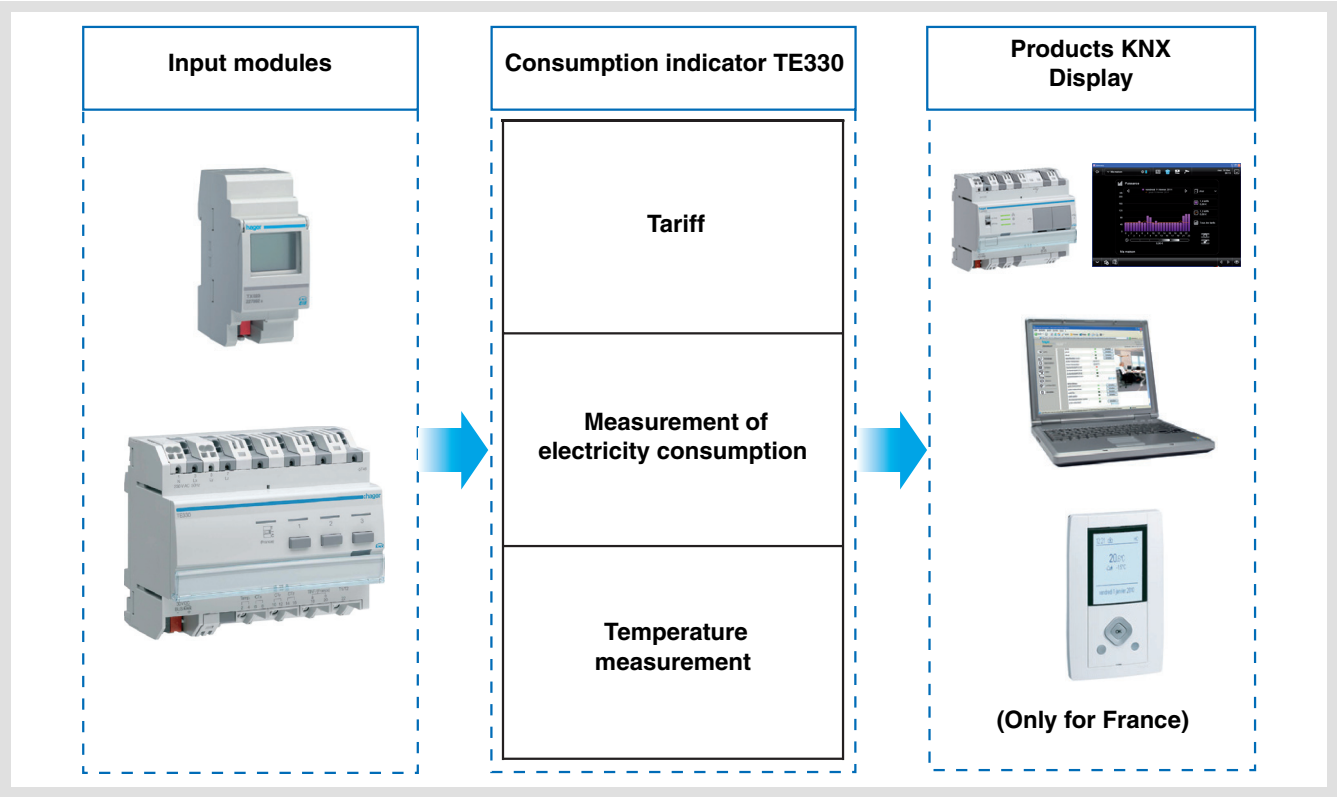
Tebis TX100 Configurator

Consumption indicator TE330

Electrical / Mechanical characteristics: see product user's instructions

	Product reference	Product designation	TX100 version	TP device RF device
	TE330	Consumption indicator	2.6.0 version	



Summary

1. Description of the system

1.1 General overview

The consumption indicator informs users of their consumption through 4 metering channels including one specifically dedicated to "Tele-information"*. It is used to monitor and control energy consumption and is built into an automatic global energy management system.

It is also used to meausre the energy produced for installations with a photovoltaic system. All this data is sent on the KNX bus.

In addition to metering, the consumption indicator also has:

- 2 tariff inputs: "Tele-information" and "T1 / T2",
- a temperature input for the connection of a probe.

The system can be constructed with several TE330 on the bus. This thus makes it possible to measure one or more circuits using toroids.

The consumption indicator is adapted for use with domovea. In this case, the display devices are:

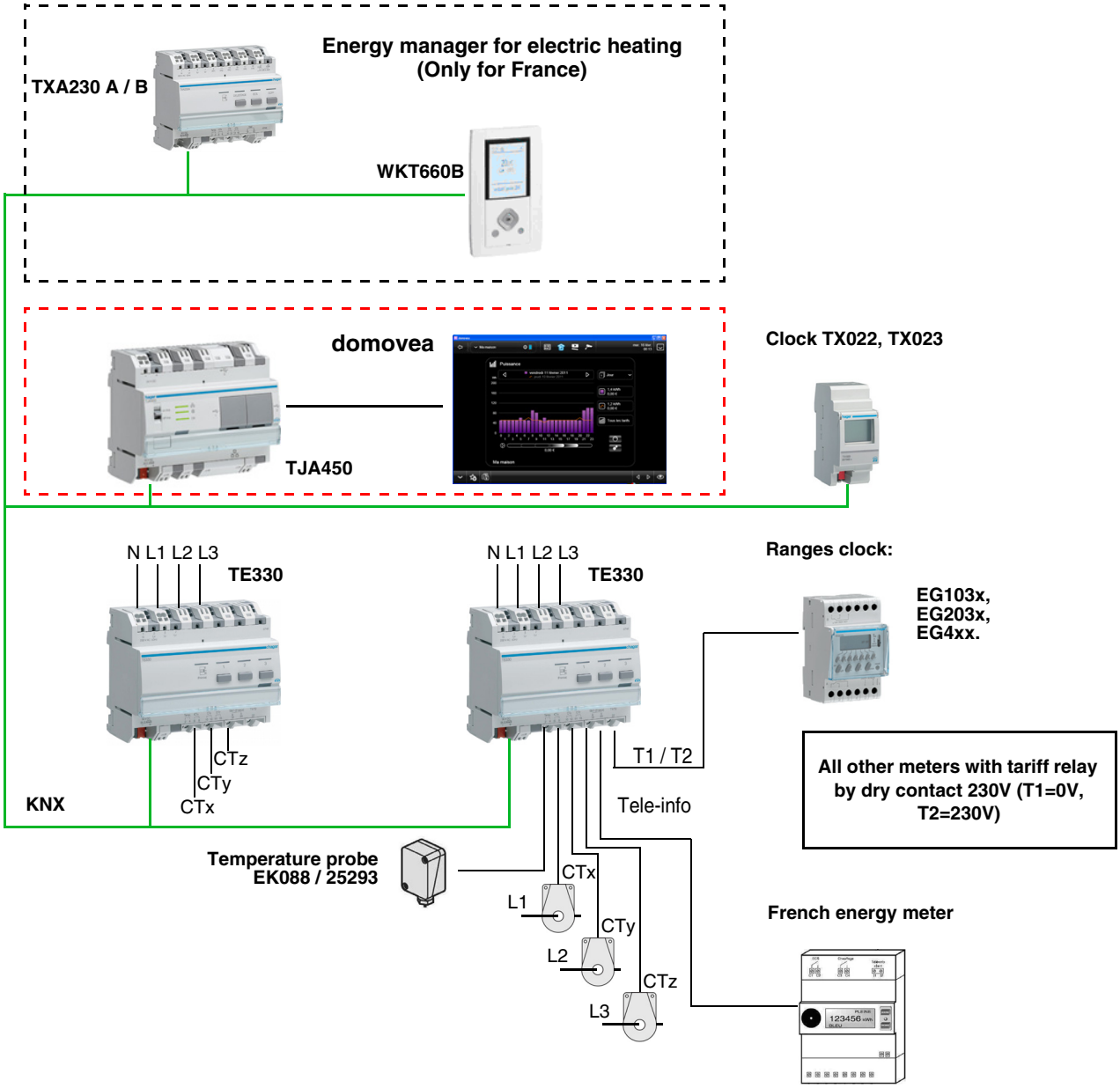
- Meter (Consumption),
- Meter (Production),
- Energy,
- Power,
- Sub-counter (Consumption).

It can also be interfaced with the ambiance units or other display systems thanks to object sent on the KNX bus.

It is used to display the current tariff and the energy consumption according to the current tariff. The tariff can also be distributed to other devices on the bus.

* Only used in France - See chapter 2.3.

1.2 General outline



2. Presentation of the functions

2.1 The main functions are the following

Tariff

The function is used to:

- Supply the value of the current tariff on the bus for an ambiance display,
- Supply the value of the coming tariff on the bus for display in ambiance - only available with Tele-information,
- Index the current tariff to each metering measurement.

Power

The function is used to supply the power demand value on the bus for each metering channel.

Energy

The function is used to supply the consumed energy value on the bus for each metering input.

Partial meter Reset

The function is used to reset the partial counters to zero for all the metering inputs.

Metering data dynamic mode

The function is used to refresh the metering data at a higher frequency.
The control is received from a display interface when the requet for data display is made.

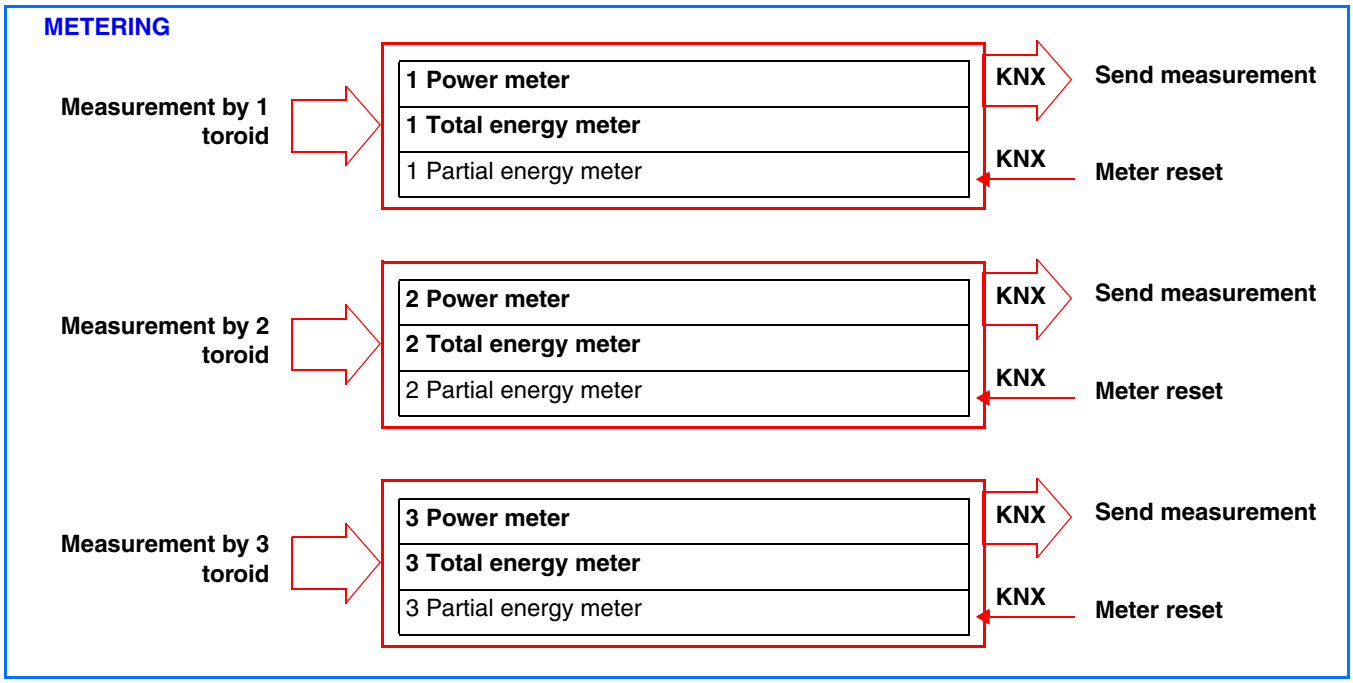
Temperature measurement

The function is used to measure the temperature via a temperature probe.
The data is sent on the bus for remote display.

2.2 Description of measurement

The consumption indicator has 4 measurement channels.

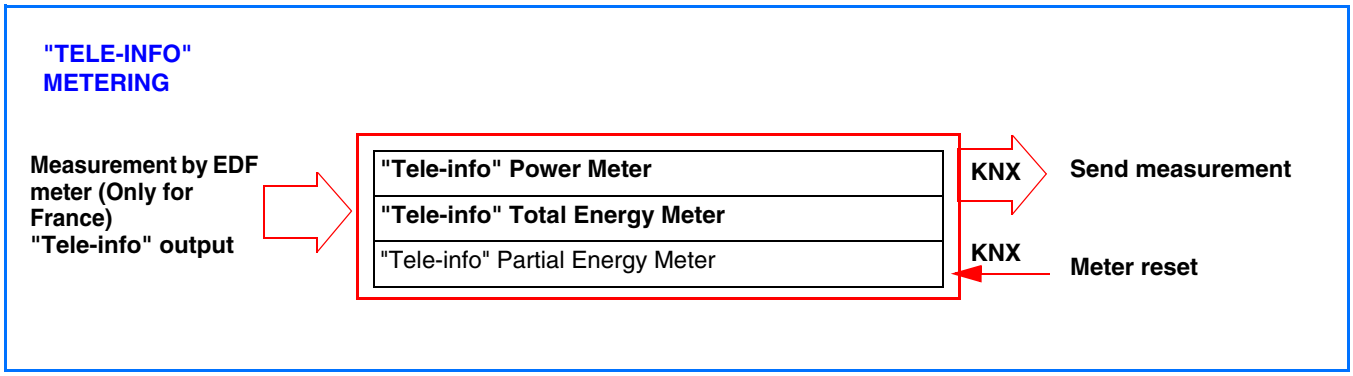
- 3 measurement channels per toroid



The current is measured using toroids. The polarity of the toroids is of no importance.

Optional

- 1 channel to report the data from the general meter by tele-information (Only for France)



Installation type
This product can be used in a single-phase or three-phase installation. Measurement of consumption with three-phase can be performed on each phase (measurement in single phase on each phase). The measurement is an absolute value.

The measurement channels are used to meter either consumption of energy production (e.g. in the case of a photovoltaic installation).

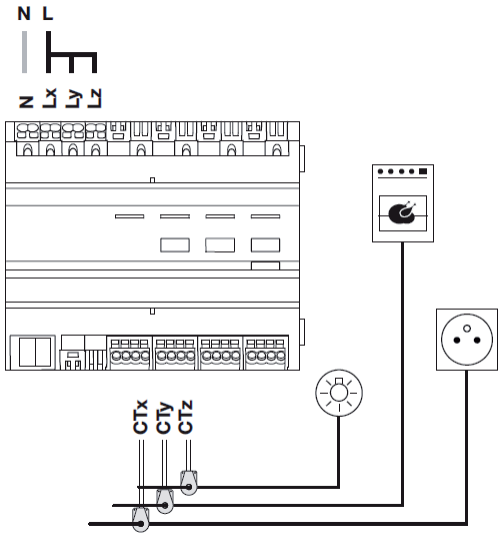
It is the display system (in domovea for example) which defines the display of consumption or energy production.

Precaution for connection
Voltage measurement is performed between a phase and neutral.
Each toroid can meter a current up to 90 A. It is possible to pass several conductors in one toroid. The metering channel CTx is referenced to the Lx phase, CTy to the Ly phase and CTz to the Lz phase.

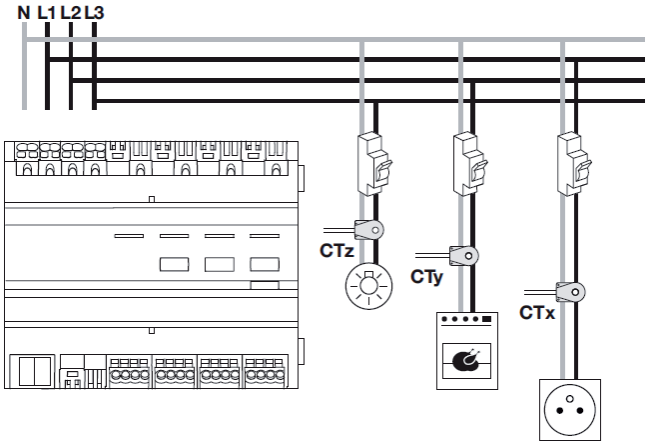
In the single-phase version, it is essential to bridge phases Ly and Lz when outputs CTy and CTz are used for metering. Straps are provided for this bridging.

(See chapter 10.4 for all the connection cases).

Single-phase version



Three-phase version



Reset
The total energy is the energy counted since the product was installed and cannot be reset.
The partial energy can be reset manually by the user using a control on the KNX bus.

Last mode stored
Only the indexes for the current total and partial energies are saved in the TE330.

Updating the data
The metering channels give the instantaneous power and the total and partial energy. This data is sent when the value changes or periodically.

2.3 "Tele-information" Tariff Description

The "Tele-information" link is a standardised bus **used only in France** which is used to connect electricity management equipment to one's electronic meter (EDF). It uses the data availalbe in the meter such as the tariff option subscribed to, the power subscribed to and the consumption data.

By connecting this interface to equipment, it is possible to monitor the development of one's consumption in real time, to calculate costs or control equipment according to the tariff.

2.4 Description of temperature measurement

The function is used to measure the temperature via a temperature probe (Ref: EK088). This additional input has no connection with consumption measurement. It is used to measure temperature without adding additional devices to the KNX bus and send the measurement to a display interface (measurement range: -30°C to +70°C).

3. TE330 inputs and outputs

- Energy saving function

Inputs	Numbering	Outputs
1 temperature channel	+info	

- Energy management function

Inputs	Numbering	Outputs
4 metering channels (3 current transformers + the tele-info connection) 1 tariff information channel	+info	

4. Product installation

Steps to follow	Actions on TX100
Programming the product	Press the key to start memorisation.
Automatic allocation of group addresses	• Go to Menu / Installation management / domovea, • Confirm "Addition" in domovea, • Wait for downloading to complete. Rem: Only version 2.6.0 of TX100 and higher.
Manual allocation of group addresses for the **Metering** object tariff	Activate expert mode for display • Go to Menu / Expert / Standard, • Activate the Expert mode, • Go to Programming Mode, • Select the metering channel, • Go to expert mode to display the objects, • Go to Tariff, • Click on Addition, • Enter the group address and confirm.
Optional step: Display of the group addresses	• Go to Programming Mode, • Go to expert mode to recover the group addresses.

Steps to follow	Actions on TX100
Saving the project on a USB key to recover the group addresses on domovea	• Go to Menu / Project management / Backup, • Inser the USB key, • Select the name of the file and launch backup. Rem: see chapter 9.2 for programming under demovea.

Note:
Group addresses are automatically allocated for:

- The **Power, Total energy, Partial energy, Dynamic mode** and **Reset** objects for the Metering function (Valid for the 4 channels),
- The **Current tariff** and **Coming tariff** for the Tariff function.

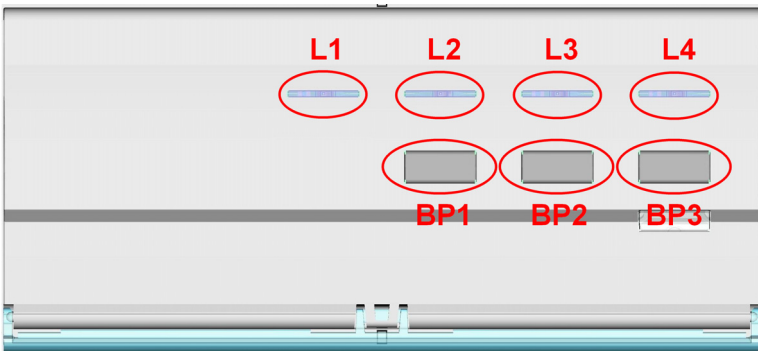
Group addresses **are not** automatically allocated for:

- The **Tariff** object for the Metering function (Valid for the 4 channels),
- The **Ext. temp** object for the Temperature function.

The information concerning these objects may come from the device or the bus.

5. Display of the input numbering

Once the consumption indicator (TE330) has been recognised by the TX100, the inputs are automatically recognised and visible only in "+info" mode.
Note the numbers of the inputs, by pressing each push button as shown in the table below.



Push button	Input	Icon	LED	Input No.
Short press BP1	Metering channel 1 (Input CTx)		LED L2 on	
Short press BP2	Metering channel 2 (Input CTy)		LED L3 on	
Short press BP3	Metering channel 3 (Input CTz)		LED L4 on	
Long press BP1	Metering "Tele-information" channel		LED L1 on	
Long press BP2	Temperature probe		LED L1 on	
Long press BP3	Tariff		LED L1 on	

6. Configuration and setting in standard mode

The TE330 consumption indicator does not have configuration and settings in standard mode. The inputs are only accessible in "+info" mode.

7. "Tele-information Setting

This parameter is accessible with the TX100 and is used to activate or deactivate the "Tele-information" metering channel.

On the TX100:

- Go to Menu / Product management / Product information,
- Select the "TE330" product,
- Click on "Param",
- Chose activation or deactivation of the "Tele-information" channel,
- Confirm your choice by pressing ✓,
- Press 3 times on the N° key to return to "Prog" mode.

After adjusting the settings, the product must be updated:

- Go to Menu / Product Management / Download,
- Select the "TE330" product,
- Confirm by clicking "yes",
- Press 3 times on the N° key to return to "Prog" mode.

By default, the **Tele-information** parameter is activated.

When the parameter is deactivated, the "Tele-information" LED is off and the metering channel is stopped.

8. Configuration and setting in Expert mode

This chapter describes the configuration of the product during installation using another display software to domovea.

8.1 General points

To set a program in Expert mode, it is necessary to have some basic knowledge in KNX (for example, software ETS).

Expert mode includes the following functions:

- Extension of the communication system: Used to access the group address given during programming in Standard mode in order to create links between a Tebis TX installation (TP, radio KNX) and Hager such as technical alarms, display, domovea server,
- Programming of additional functions: To maintain ease of programming in Standard mode, some of the device's functions may not be available in that mode. Thus, some specific solutions are only available in Expert mode,
- Delete the automatic links.

8.2 Easy Prog mode

In this mode it is possible to:

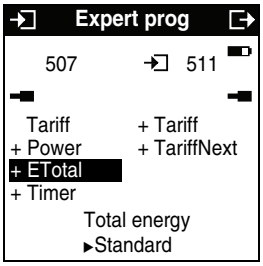
- Display all the links creaed manually and automatically,
- Delete the links created manually and automatically.

The table here after shows all type of links compatible with the product:

Possible link type		Link description	Operation of the input
Input	Type		
	Temperature	The **Temperature** object is a data item sent on the bus by the TE330.	The Temperature value is sent on the bus every 5 minutes or by variation of 0.5°C.
	Metering	The **Metering** object is a set of data sent on the bus by the TE330.	The object sends the values for: • Power, • Total energy, • Partial energy, • Dynamic mode, • Reset.
	Tariff	The **Tariff** object is a set of data sent on the bus by the TE330.	The object sends the values for: • Current tariff, • Coming tariff.

8.3 Expert Prog mode

In Expert mode, the functions are displayed through the communication objects used in the configuration ETS mode.
The objects appear as a list located under the input and output numbers.



The Expert mode allows links to be established between objects with the same format by giving them the same group address.

■ Objects appearing for the TE330

Designation TX100			ETS objects designation	Description
	OutTemp	Temperature	Temperature - Emission	Used to send the temperature.
	Tariff	Tariff	Metering - Current tariff	Used to index the partial and total energy values.
	Power	Power	Metering - Power	Used to display the instantaneous power.
	ETotal	Total energy	Metering - Total energy	Used to display the total energy consumed since the system was started up.
	Timer	Timer	Metering - Dynamic mode activation	Used to refresh the metering data more frequently.
	Reset	Partial meter Reset	Partial meter Reset - Control	Used for Partial meter Reset.
	Epartial	Partial energy	Metering - Partial energy	Used to display the partial energy consumed since the last reset.
	Tariff	Tariff	Current tariff - Emission	Used to send the current tariff received by the tele-info of the subscriber's meter.
	TariffNext	Coming tariff	Coming tariff - Emission	Used to send the coming tariff received by the tele-info of the subscriber's meter.

The TX100 does not allow links to be created for the **Voltage**, **Current** et **Choice of tariff channel** objects. Programming by ETS is required for this.

8.4 +info mode

The mode +Info can be accessed in the Prog and Visu modes of the TX100.
The +Info mode is activated for all products in the installation in progress until the mode is deactivated.
This mode enables access to the status indication of an output and to special functions. The status indication sends the current status over the network each time the status changes.
The +Info mode allows the status indication to be linked from an output to a viewing product: Area controller, LED output, etc.
The status indication sends the current status over the network each time the status changes.

The status indication is represented by the symbol .

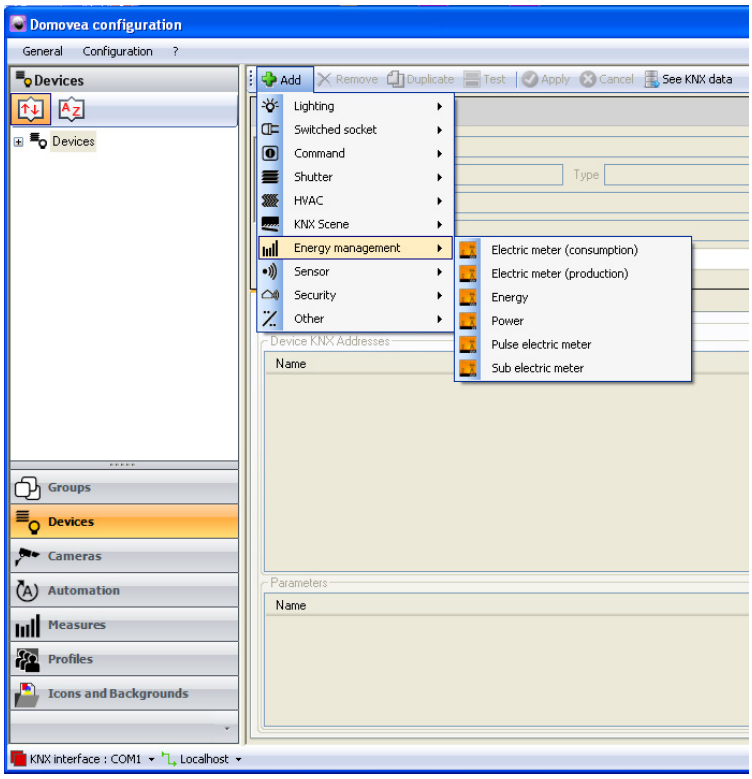
The status indication adds itself to the list of inputs on the left of the TX100 screen with the same number as the output.

9. Configuration and use with domovea

In the domovea configuator, 6 "Energy management" type devices are available:

- **Meter (Consumption)**: Device used to display the instantaneous power and energy consumed by an electrical circuit and including tariff management,
- **Meter (Production)**: Device used to display the instantaneous power and energy produced in an energy production installation,
- **Impulsion electricity meter**: Device used to recover the impulsions from a meter and convert them into energy value (Do not use with TE330),
- **Energy**: Device used to display the energy consumed by an electrical circuit,
- **Power**: Device used to display the instantaneous power consumed by an electrical circuit,
- **Sub-counter (Consumption)**: Device used to display the instantaneous power and energy consumed by an electrical circuit without including tariff management.

9.1 Adding the device

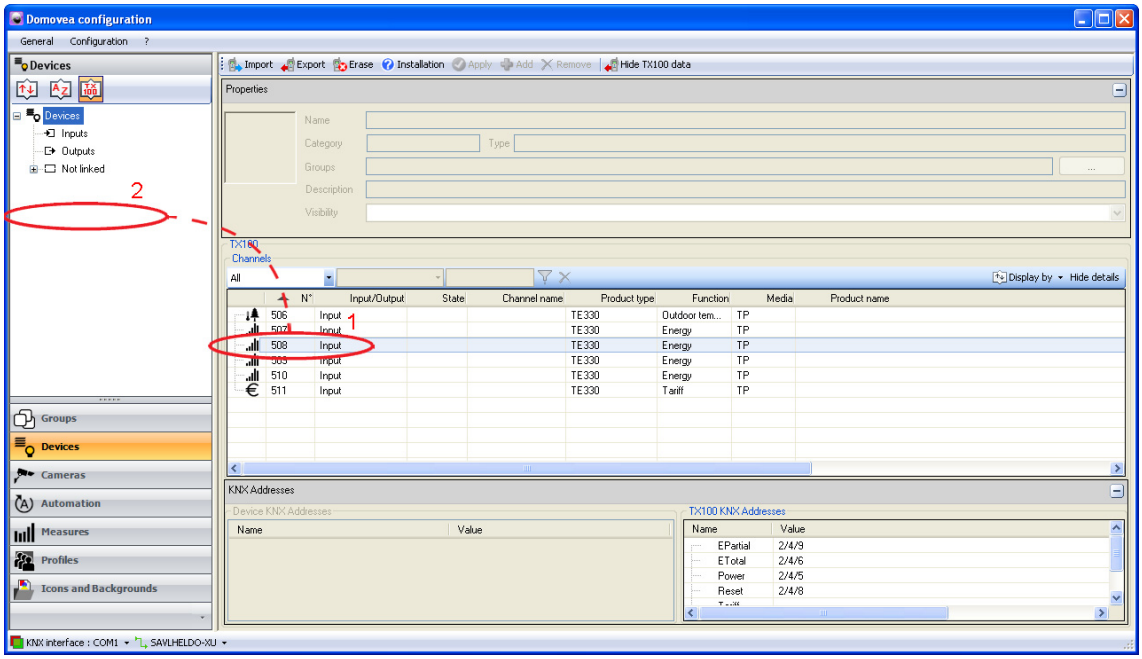


Type of counter	See chapter
Meter (Consumption)	9.3
Meter (Production)	9.4
Energy	9.5
Power	9.6
Sub-counter (Consumption)	9.7

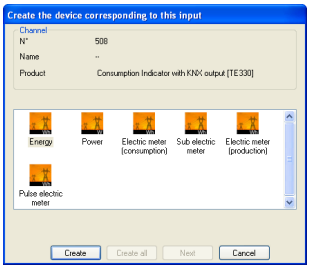
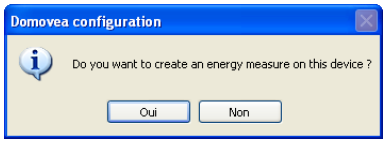
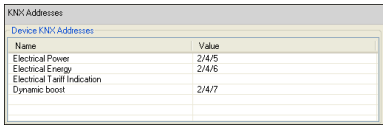
9.2 Importation of group addresses

Execute the following steps:

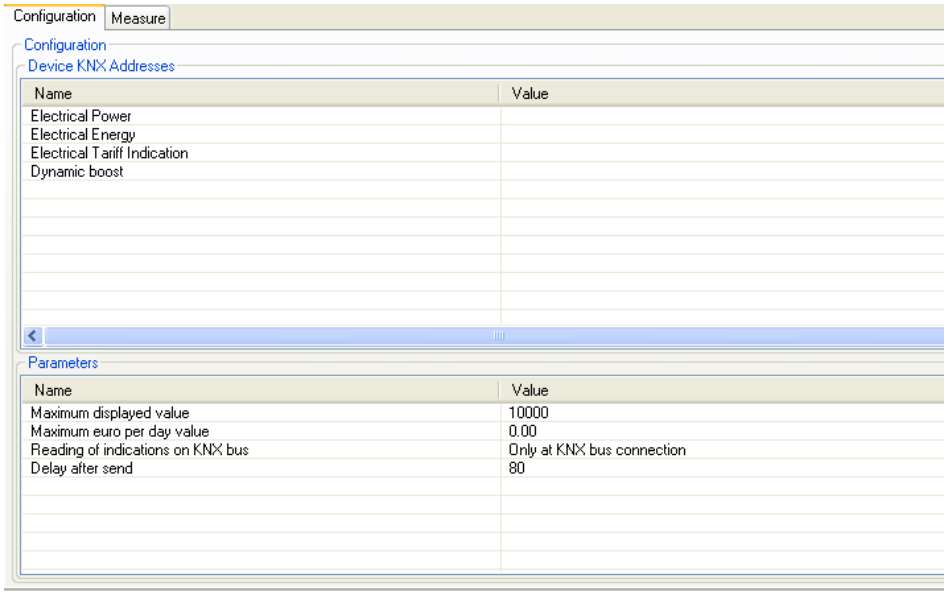
- Select the "Devices" tab,
- Select a device (E.g. meter),
- Click on "See the KNX data / "Configure by TX100",
- Click on "Import" and select the TX100 (*.TXH) project backup file,
- Click on "Display by ..." the "Input" to display the list of objects,
- Click on "See the details" to display the KNX TX100 addresses.



Select the number of the desired input (1) then drag and drop this input into the device field (2).

	• Select the device to be created according to the type of input you have chosen.
	• Click YES to create an energy measurement on this device, • Click NO if not. (See domovea ENERGY documentation).
	• After validation, the group addresses will be automatically allocated.

9.3 Configuration of the Meter device (Consumption)



➜ KNX addresses for the device

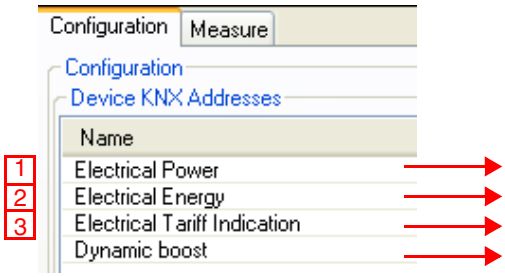
Designation	Function
Electrical power	This parameter is used to display the value of the electrical power consumed.
Electrical energy	This parameter is used to display the value of the electrical energy consumed.
Indication of electricity tariff	This parameter is used to display the current tariff.
Dynamic restart	This parameter is used to force send mode for the electrical power value to update the value faster. It is activated for a duration that can be configured in ETS.

➜ Parameters

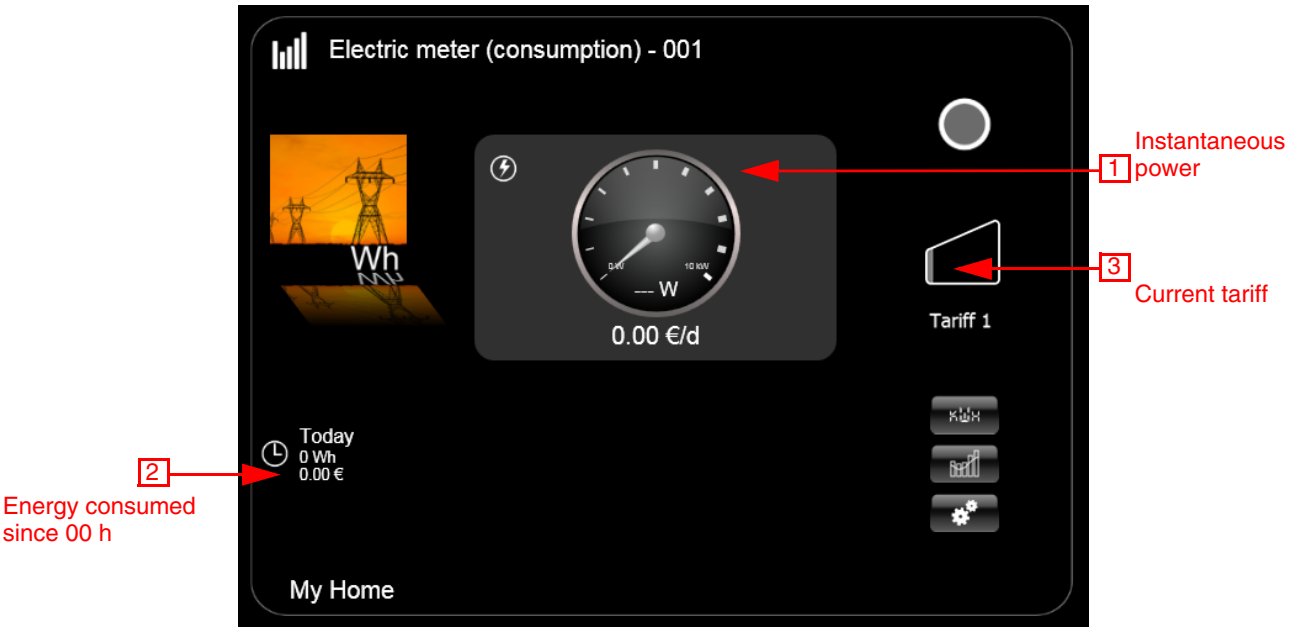
Designation	Function	Value
Maximum displayed power	Used to define the upper limit of the meter displaying the electrical power.	Range [100 W - 100.000 W] Default value: 10.000 W
Alarm threshold	Used to define the alarm threshold beyond which the electricity consumption indicator sends a threshold exceeded alarm.	Range [0 €/Day - 100.000 €/Day] Default value: 10.000 €/Day
Reading of the status indications on the KNX bus	Used to define the frequency at which the status indications are read on the KNX bus.	Only during connection to the bus, 1 min (Risk of bus saturation) 2 min (Risk of bus saturation) 3 min, 5 min, 10 min, 15 min, 30 min, 45 min, 1 h, 2 h, 3 h, 5 h, 12 h, 24 h, Never Default value: Only during connection to the bus
Delay after sending	Used to define the time delay after which objects are sent.	Range [0 ms - 400 ms] Default value: 80 ms

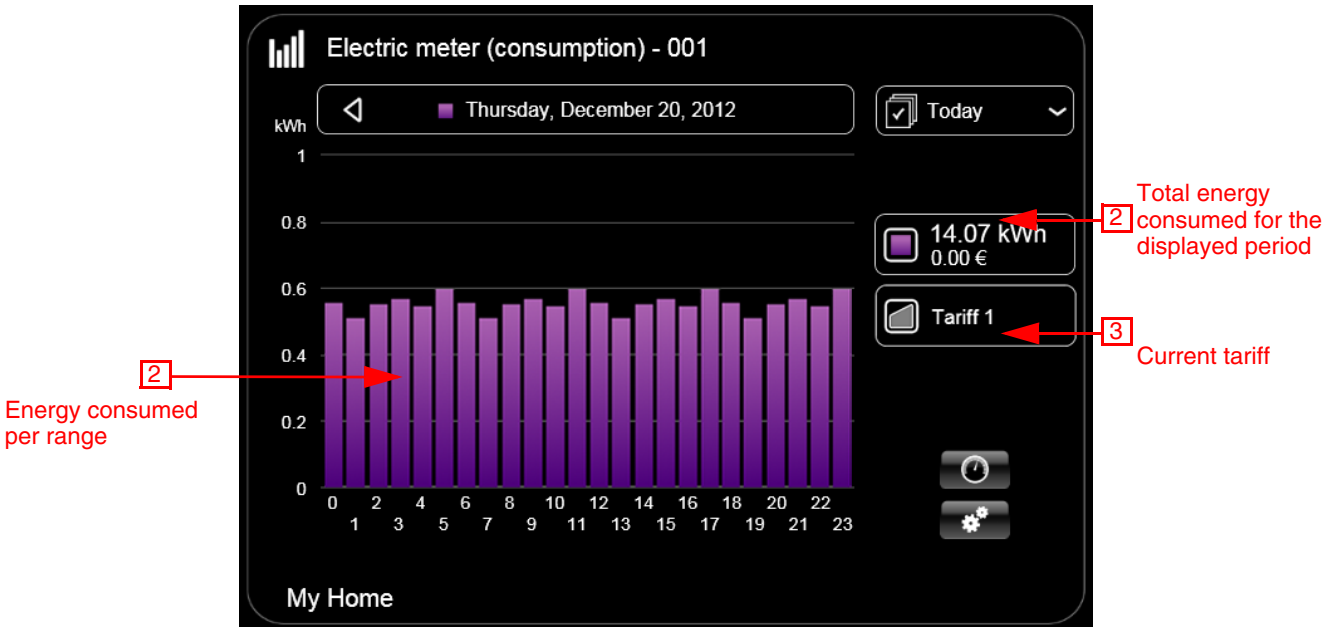
➜ Links to be created: Report the addresses of the following objects of the TE330

Configuration domovea



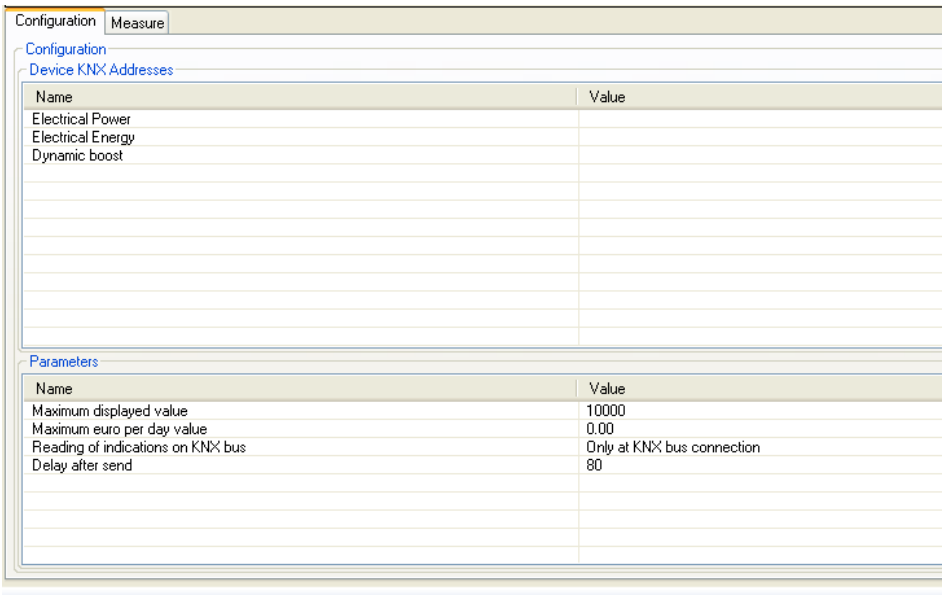
Designation TX100		
Power		Power
Epartial		Partial energy
Tariff		Tariff
Timer		Timer





For more details, see the domovea information sheet "energy display".

9.4 Configuration of the Meter device (Production)



➜ KNX addresses for the device

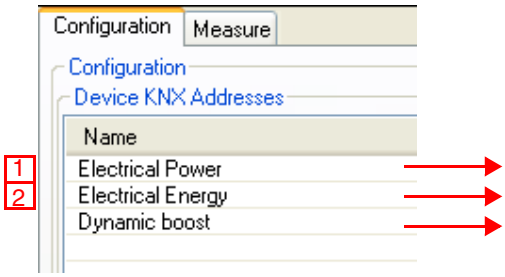
Designation	Function
Electrical power	This parameter is used to display the value of the electrical power produced.
Electrical energy	This parameter is used to display the value of the electrical energy produced.
Dynamic restart	This parameter is used to force send mode for the electrical power value to update the value faster. It is activated for a duration that can be configured in ETS.

➜ Parameters

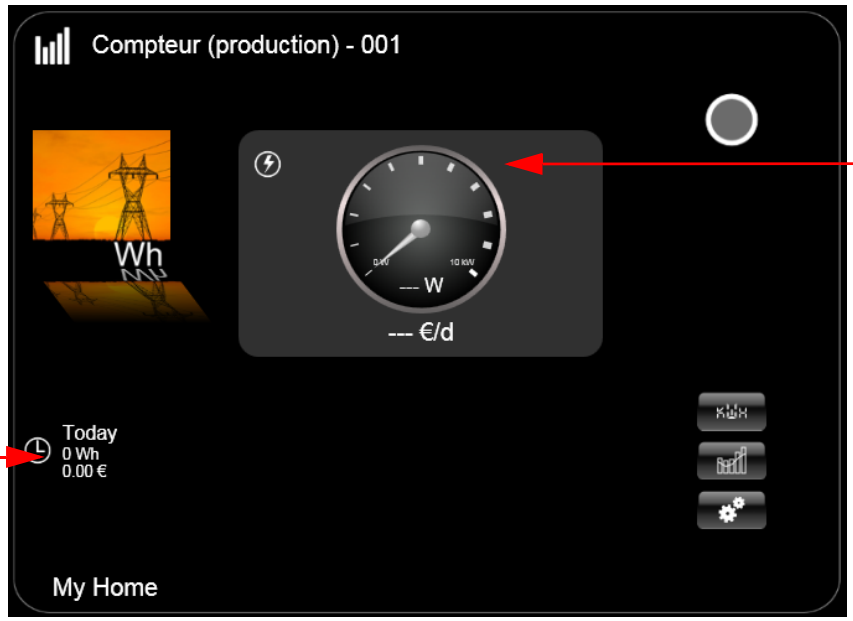
Designation	Function	Value
Maximum displayed power	Used to define the upper limit of the meter displaying the electrical power.	Range [100 W - 100.000 W] Default value: 10.000 W
Alarm threshold	Used to define the alarm threshold beyond which the electricity consumption indicator sends a threshold exceeded alarm.	Range [0 €/Day - 100.000 €/Day] Default value: 10.000 €/Day
Reading of the status indications on the KNX bus	Used to define the frequency at which the status indications are read on the KNX bus.	Only during connection to the bus, 1 min (Risk of bus saturation) 2 min (Risk of bus saturation) 3 min, 5 min, 10 min, 15 min, 30 min, 45 min, 1 h, 2 h, 3 h, 5 h, 12 h, 24 h, Never Default value: Only during connection to the bus
Delay after sending	Used to define the time delay after which objects are sent.	Range [0 ms - 400 ms] Default value: 80 ms

➜ Links to be created: Report the addresses of the following objects of the TE330

Configuration domovea

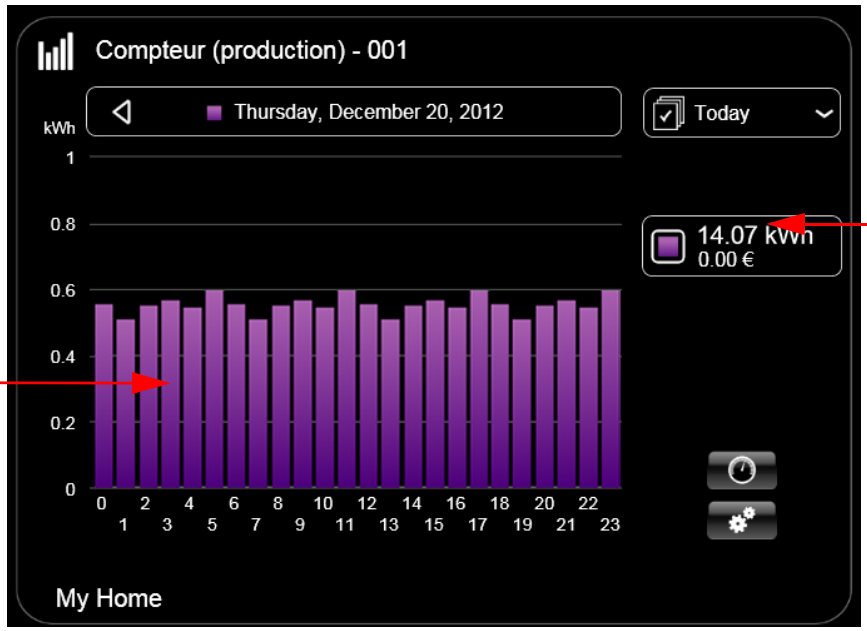


Designation TX100		
Power		Power
Epartial		Partial energy
Timer		Timer



1 Instantaneous power

2 Energy produced since 00 h

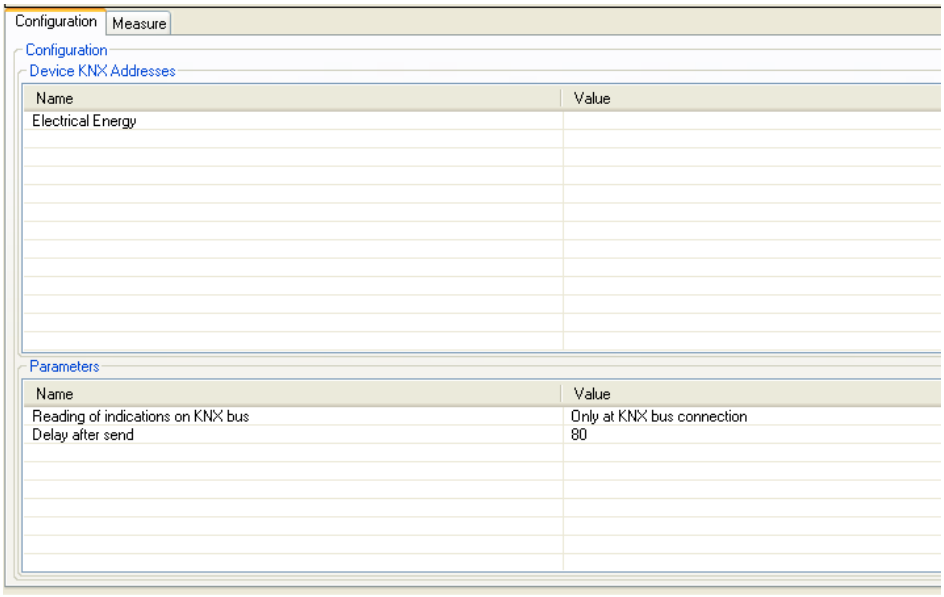


2 Total energy produced for the displayed period

2 Energy produced per range

For more details, see the domovea information sheet "energy display".

9.5 Configuration of the Energy device



➜ KNX addresses for the device

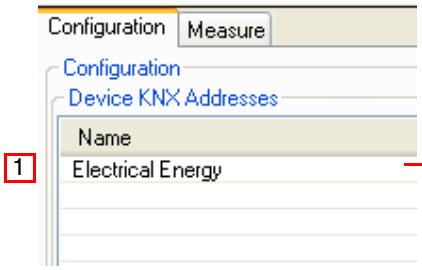
Designation	Function
Electrical energy	This parameter is used to display the value of the electrical energy consumed.

➜ Parameters

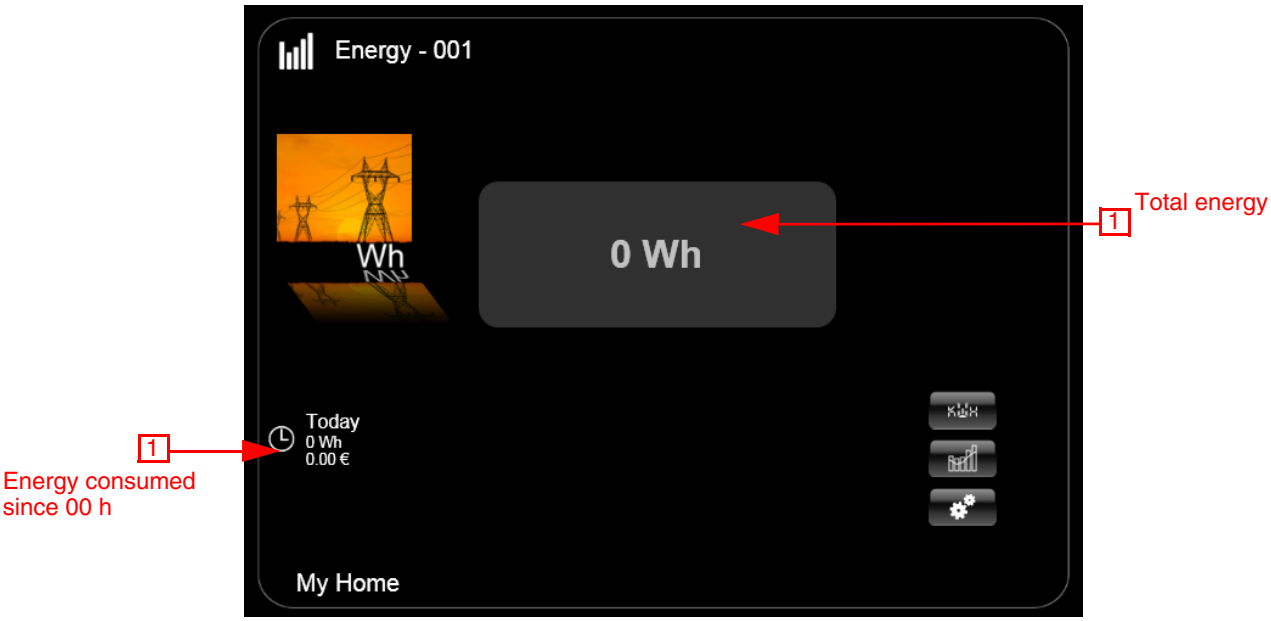
Designation	Function	Value
Reading of the status indications on the KNX bus	Used to define the frequency at which the status indications are read on the KNX bus.	Only during connection to the bus, 1 min (Risk of bus saturation) 2 min (Risk of bus saturation) 3 min, 5 min, 10 min, 15 min, 30 min, 45 min, 1 h, 2 h, 3 h, 5 h, 12 h, 24 h, Never Default value: Only during connection to the bus
Delay after sending	Used to define the time delay after which objects are sent.	Range [0 ms - 400 ms] Default value: 80 ms

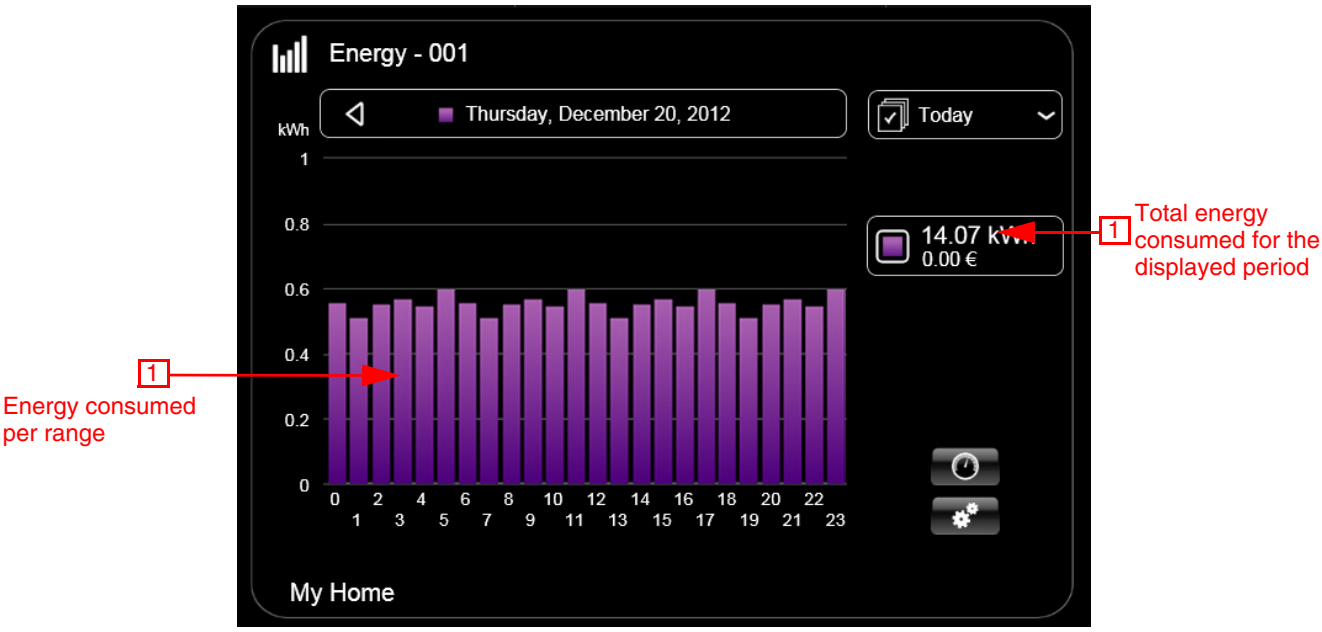
➜ Links to be created: Report the addresses of the following objects of the TE330

Configuration domovea



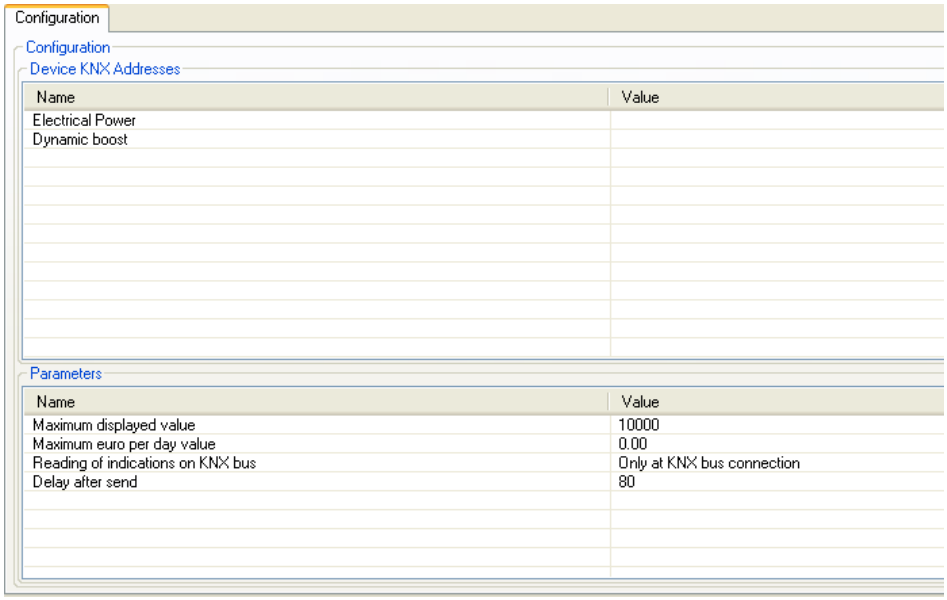
Designation TX100		
Epartial		Partial energy





For more details, see the domovea information sheet "energy display".

9.6 Configuration of the Power device



➜ KNX addresses for the device

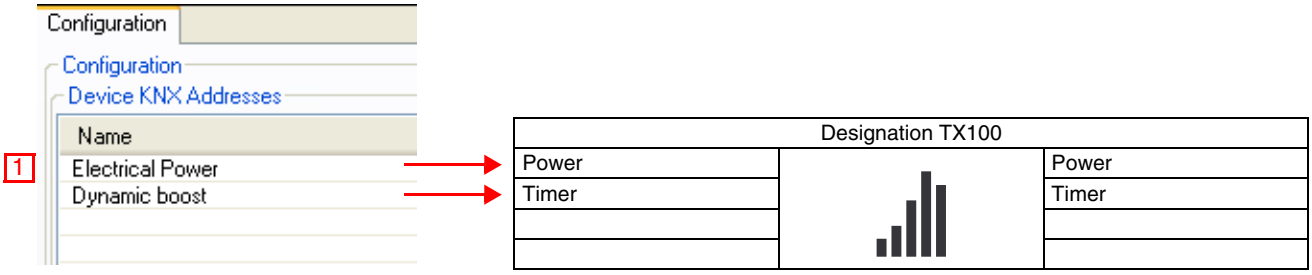
Designation	Function
Electrical power	This parameter is used to display the value of the electrical power consumed.
Dynamic restart	This parameter is used to force send mode for the electrical power value to update the value faster. It is activated for a duration that can be configured in ETS.

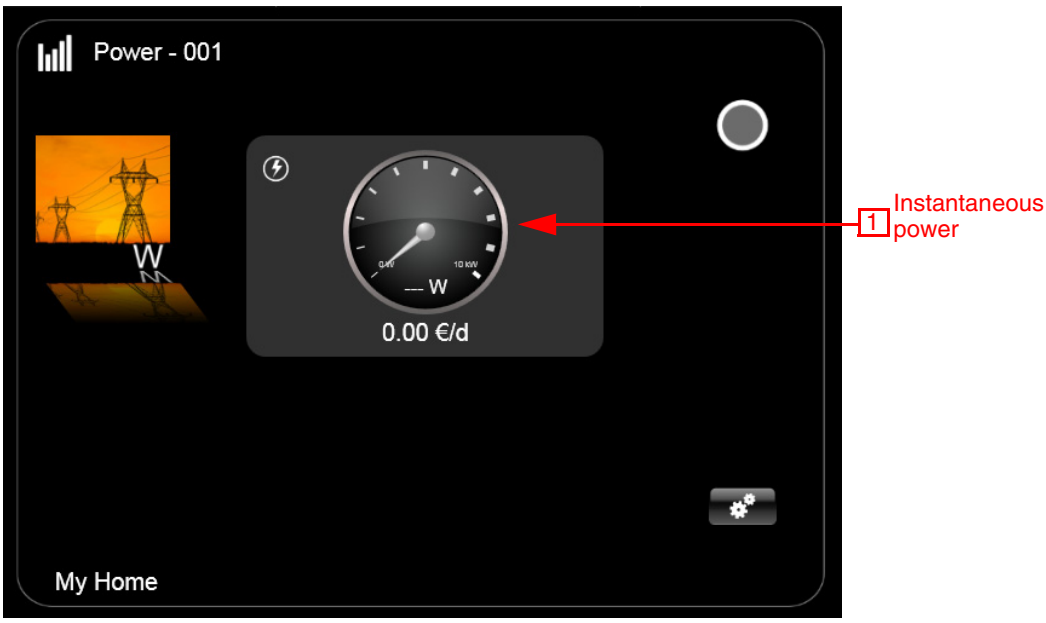
➜ Parameters

Designation	Function	Value
Maximum displayed power	Used to define the upper limit of the meter displaying the electrical power.	Range [100 W - 100.000 W] Default value: 10.000 W
Alarm threshold	Used to define the alarm threshold beyond which the electricity consumption indicator sends a threshold exceeded alarm.	Range [0 €/Day - 100.000 €/Day] Default value: 10.000 €/Day
Reading of the status indications on the KNX bus	Used to define the frequency at which the status indications are read on the KNX bus.	Only during connection to the bus, 1 min (Risk of bus saturation) 2 min (Risk of bus saturation) 3 min, 5 min, 10 min, 15 min, 30 min, 45 min, 1 h, 2 h, 3 h, 5 h, 12 h, 24 h, Never Default value: Only during connection to the bus
Delay after sending	Used to define the time delay after which objects are sent.	Range [0 ms - 400 ms] Default value: 80 ms

➜ Links to be created: Report the addresses of the following objects of the TE330

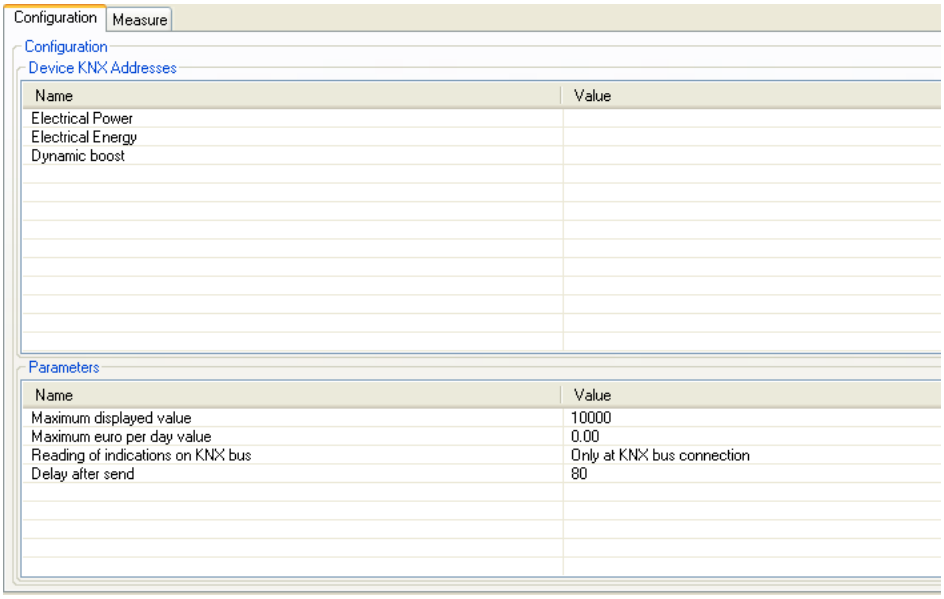
Configuration domovea





For more details, see the domovea information sheet "energy display".

9.7 Configuration of the Sub-counter device (Consumption)



➜ KNX addresses for the device

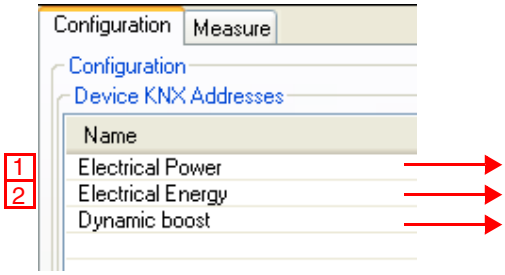
Designation	Function
Electrical power	This parameter is used to display the value of the electrical power consumed.
Electrical energy	This parameter is used to display the value of the electrical energy consumed.
Dynamic restart	This parameter is used to force send mode for the electrical power value to update the value faster. It is activated for a duration that can be configured in ETS.

➜ Parameters

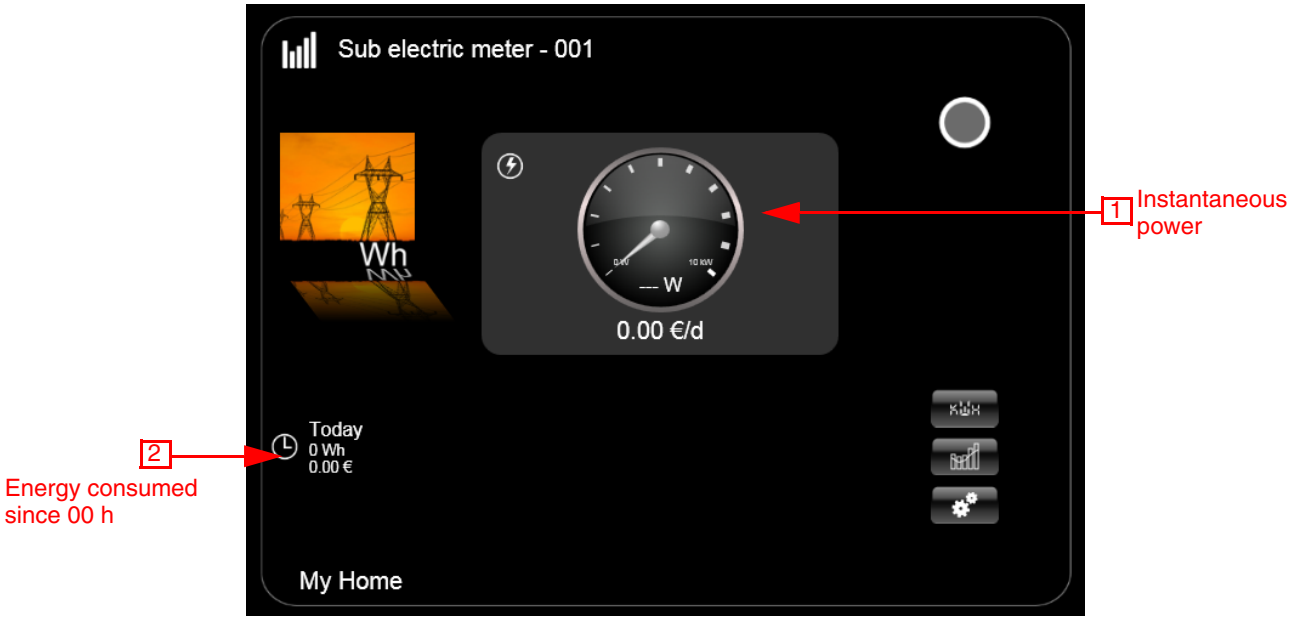
Designation	Function	Value
Maximum displayed power	Used to define the upper limit of the meter displaying the electrical power.	Range [100 W - 100.000 W] Default value: 10.000 W
Alarm threshold	Used to define the alarm threshold beyond which the electricity consumption indicator sends a threshold exceeded alarm.	Range [0 €/Day - 100.000 €/Day] Default value: 10.000 €/Day
Reading of the status indications on the KNX bus	Used to define the frequency at which the status indications are read on the KNX bus.	Only during connection to the bus, 1 min (Risk of bus saturation) 2 min (Risk of bus saturation) 3 min, 5 min, 10 min, 15 min, 30 min, 45 min, 1 h, 2 h, 3 h, 5 h, 12 h, 24 h, Never Default value: Only during connection to the bus
Delay after sending	Used to define the time delay after which objects are sent.	Range [0 ms - 400 ms] Default value: 80 ms

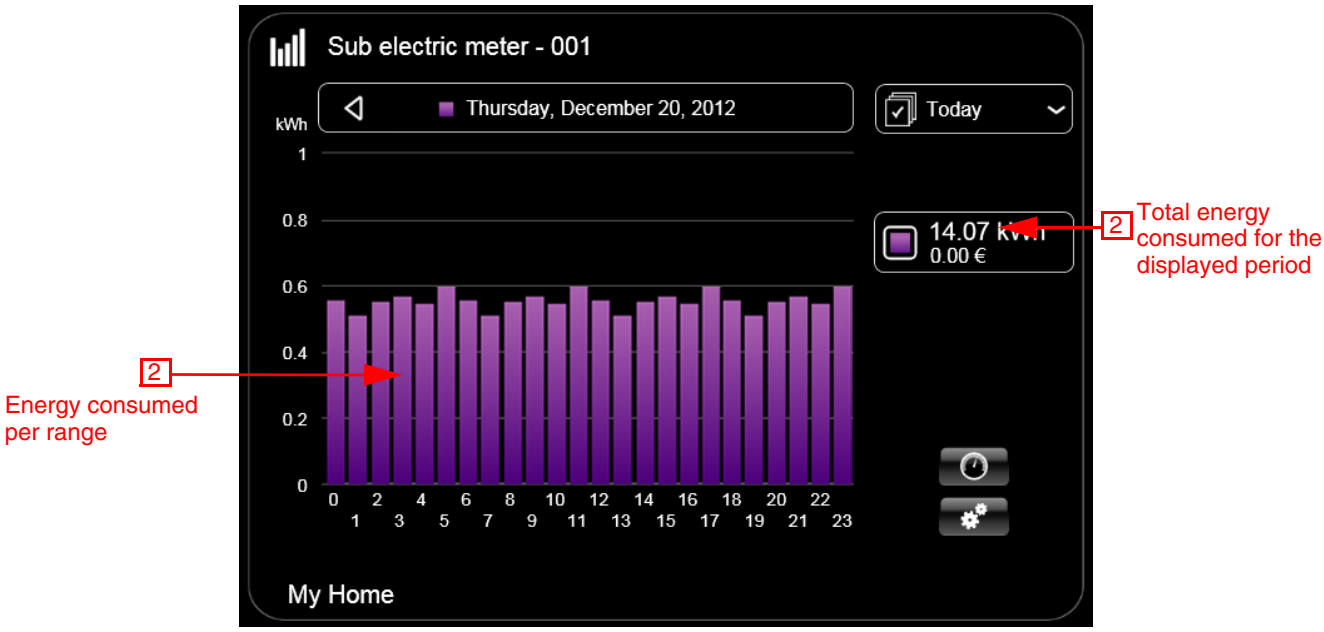
➜ Links to be created: Report the addresses of the following objects of the TE330:

Configuration Domovea



Designation TX100		
Power		Power
Epartial		Partial energy
Timer		Timer

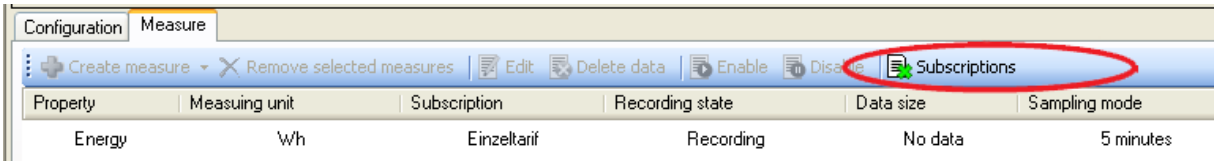




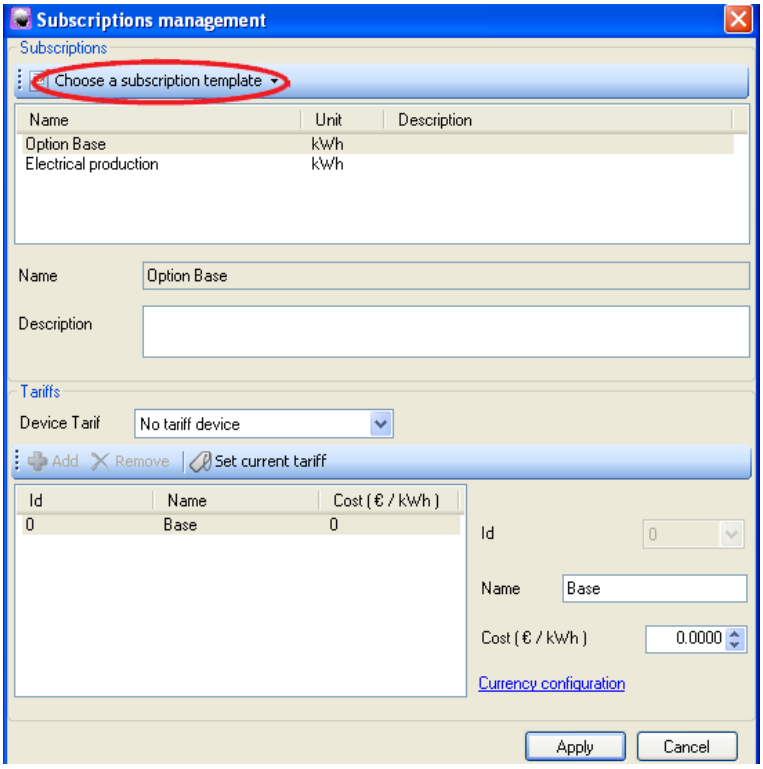
For more details, see the domovea information sheet "energy display".

9.8 Choice of tariff under domovea

Domovea allows a tariff to be defined according to the offer subscribed to. To to so, click on the "Measurements" tab for the device used, then on "Subscription".



Define your subscription by clicking on "Chose a subscription model".



Domovea has tariff models according to the country (France or Germany) and a personalised model (configurable).

Type	Option	Identifier	Name
German	Einzeltarif	0	Basic
	Doppeltarif	0	Tariff 1 (More expensive)
		1	Tariff 2
France	Basic	0	Basic
	Heure pleine / Heure creuse	1	Heure creuse
		2	Heure pleine
	Tempo	5	Blue HC
		6	Blanc HC
		7	Red HC
		8	Blue HP
		9	Blanc HP
		10	Red HP
	EJP	3	Normal day
		4	Peak day
Personalised		0	Tariff 0
		1	Tariff 1
		2	Tariff 2
		3	Tariff 3
		4	Tariff 4
		5	Tariff 5
		6	Tariff 6
		7	Tariff 7
		8	Tariff 8
		9	Tariff 9
		10	Tariff 10

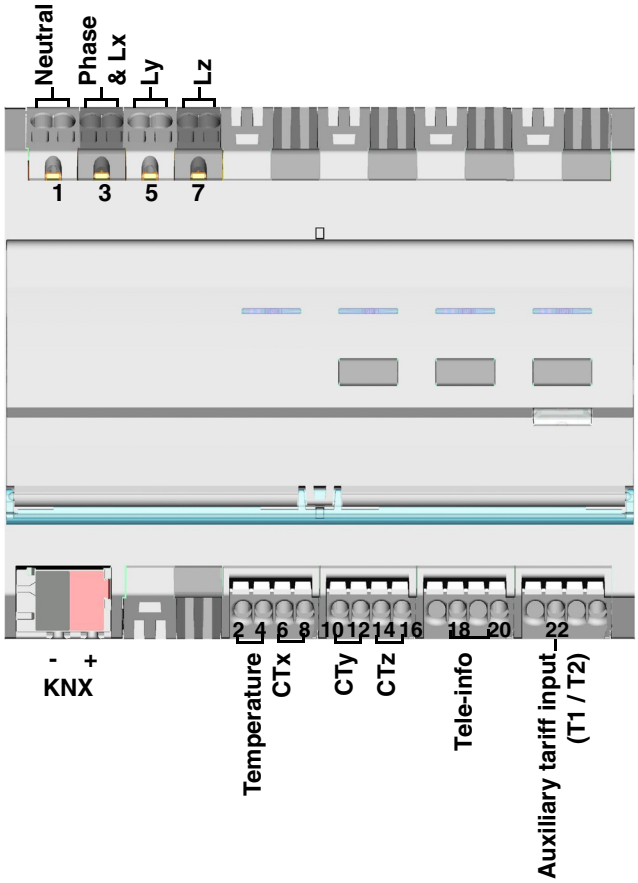
The cost of each tariff can be configured.

Example for:

- **France**: Using the "Tele-information" input
  - Click on "choice of a subscription model" then on "France" then on "EDF",
  - Define the tariff option between "Basic", "Heures pleines / Heures creuses", "Tempo" or "EJP".
- **France**: Using the T1 / T2 input without "Tele-information"
  - **Use the personalised tariff**:
    - Click on "choice of a subscription model" then "Customised model",
    - Define Tariff name0 as Heures pleines,
    - Define Tariff name 1 as Heures creuses,
    - Delete tariffs 2 to 10 which are not used in this case.
- **Germany**: Use input T1 / T2
  - Click on "choice of subscription model" then on "Germany",
  - Define the tariff option between "Einzeltarif" and "Doppeltarif".
- **Other countries: Use the personalised tariff**
  - Click on "choice of a subscription model" then "Customised model",
  - Define the tariff option according to your installation by configuriong the tariff 0 to 10.

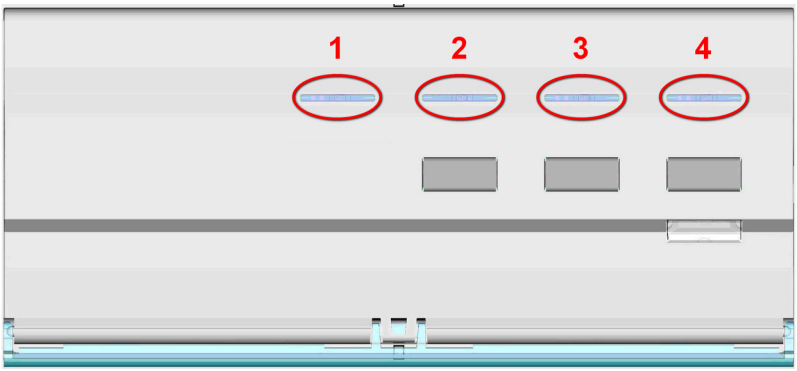
10. Operation

10.1 Installation



Remark: The 3 buttons are only used for configuration with the TX100.

10.2 Meaning of the LED's



Channel	Function	LED 1	LED 2	LED 3	LED 4
Tele-info (Only in France)	Activated	ON	X	X	X
	Deactivated	OFF	X	X	X
	Communication error or error on the channel	Flashing	X	X	X
Channel 1	Operating	X	Flashes for every 1 Wh consumed	X	X
	No bridging in single phase or no phase in three-phase	X	Flashing at a frequency of 2 Hz*	X	X
Channel 2	Operating	X	X	Flashes for every 1 Wh consumed	X
	No bridging in single phase or no phase in three-phase	X	X	Flashing at a frequency of 2 Hz*	X
Channel 3	Operating	X	X	X	Flashes for every 1 Wh consumed
	No bridging in single phase or no phase in three-phase	X	X	X	Flashing at a frequency of 2 Hz*
	No mains power on inputs N and Lx or ETS downloading error	Flashing	Flashing	Flashing	Flashing

* 2 Hz corresponds to 1 s LED ON and 1 s LED OFF.

Remark: Indication of the presence or absence of a wiring error can take up to one minute.

10.3 Current outage and return

The consumption indicator requires mains power and a power supply to the KNX bus to operate.

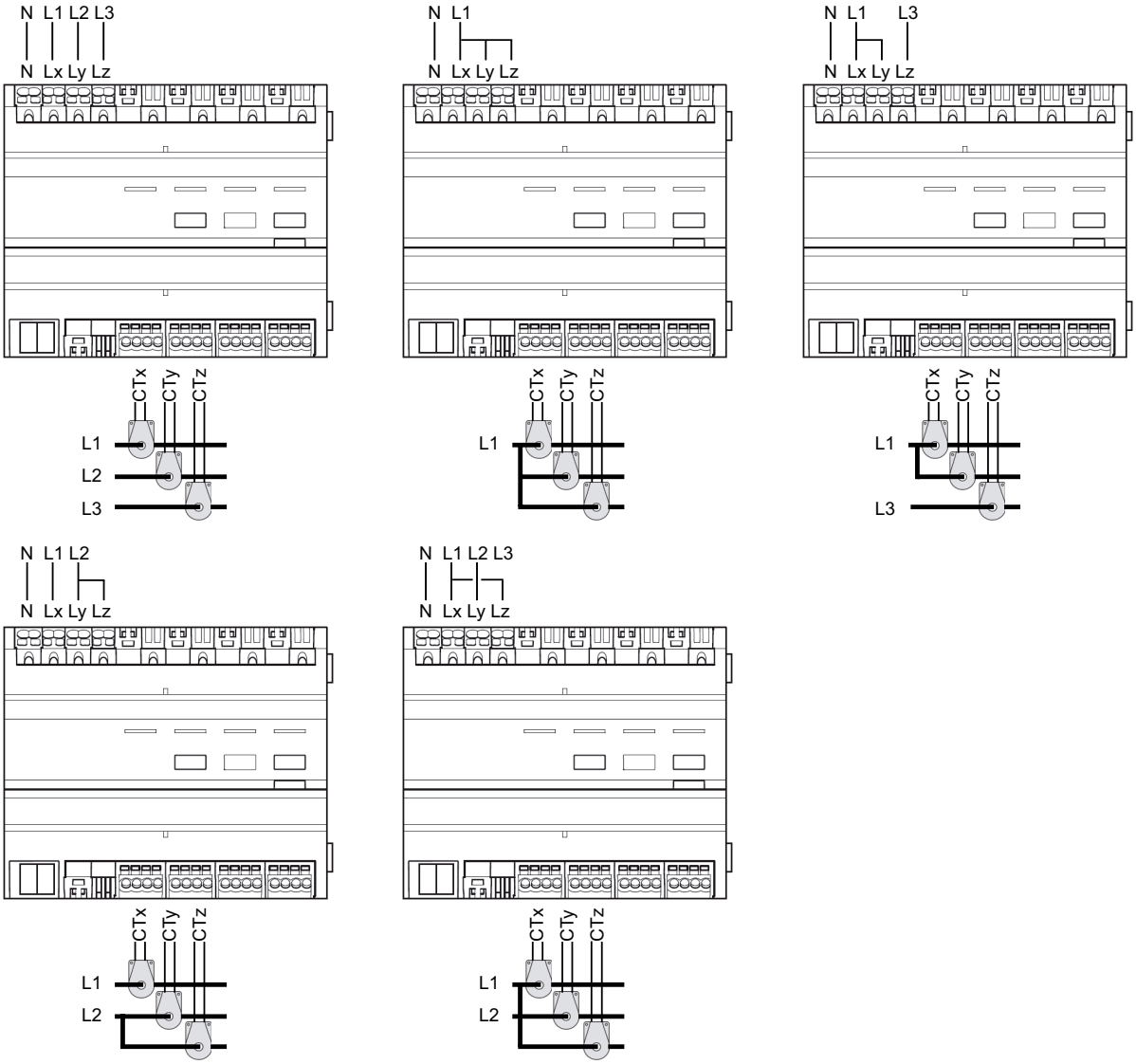
Mains power fault: After 60 s, the energy, current, voltage and power data returns to 0 and is still sent on the bus according to the defined period. When the mains power is restored, the data is sent normally again.

KNX bus fault or mains + KNX bus fault: The consumption indicator is deemed to be out of service. No data is sent. When the bus connection and power supply are restored, the system takes a few minutes to restart and send data normally.

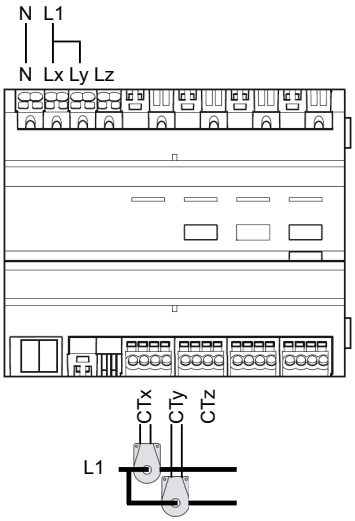
Remark: To address or configure the product, only the KNX bus requires power.

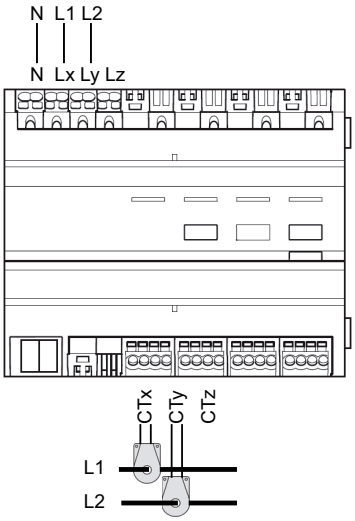
10.4 Connection of the toroids according to the number of phases

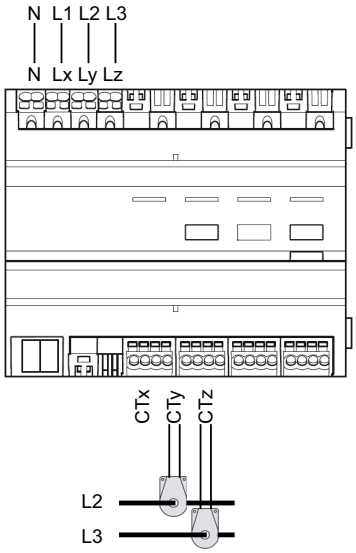
➜ 3 metering channels

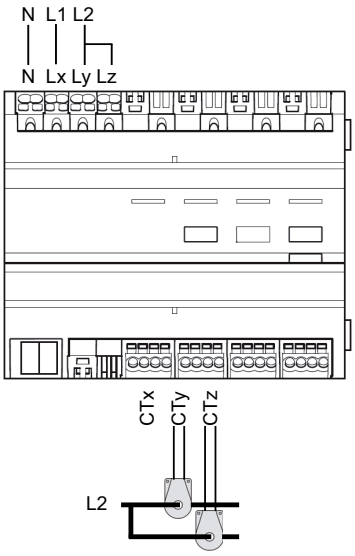


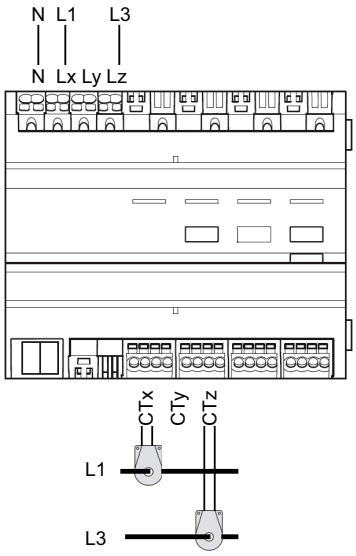
→ 2 metering channels

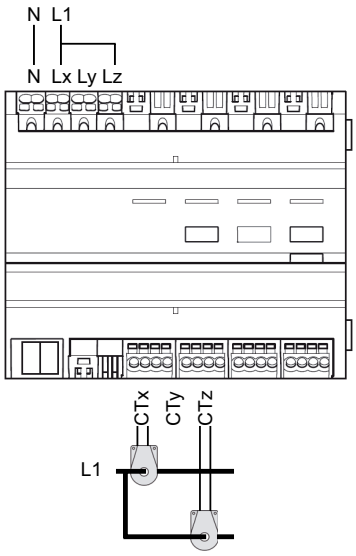


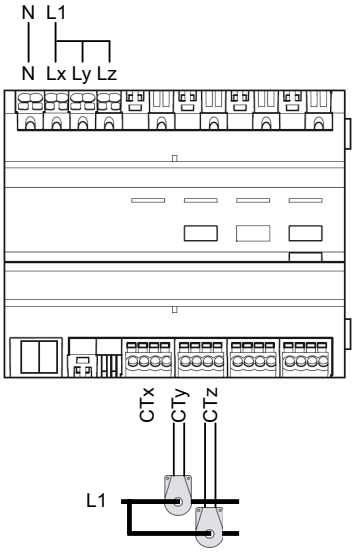


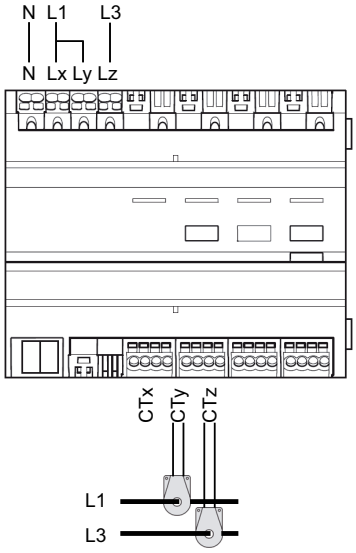


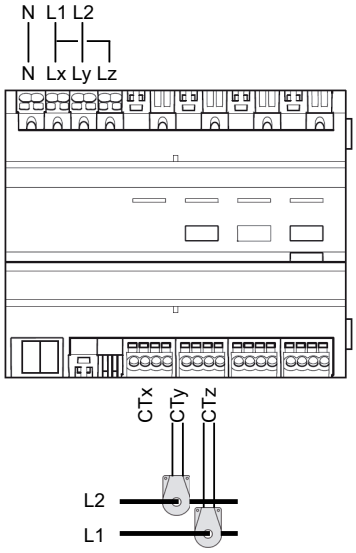




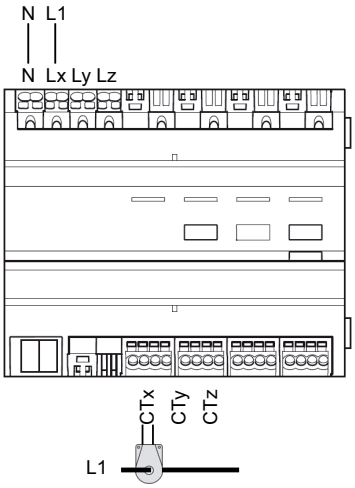


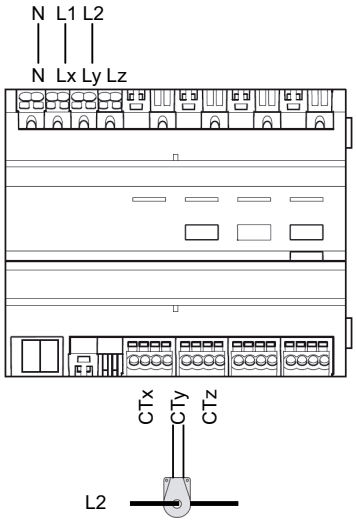


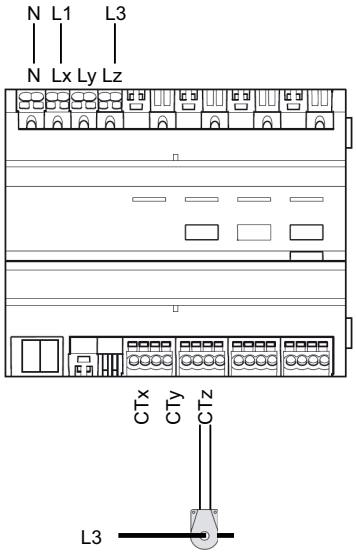


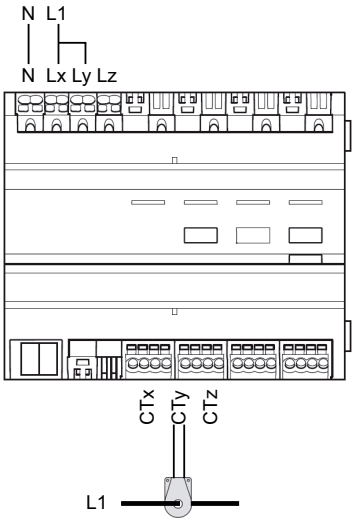


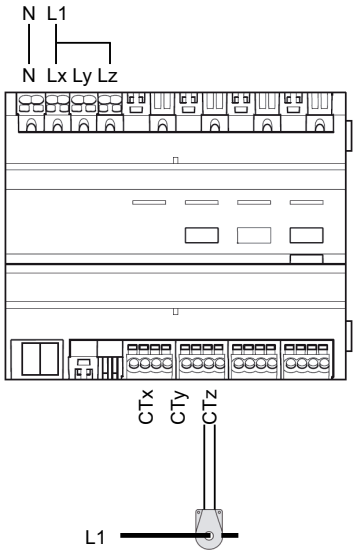
➜ 1 metering channel











11. Other functions

Restore Factory Configuration function

This function enables the device to be returned to its initial configuration (configuration when it came out of the factory).
After a factory reset, the product can be reconfigured or reused in a new installation..
This function is accessible via the TX100's Device Management / Reset menu.

There are 2 different cases::

- The device belongs to the installation: it appears in the Reset menu's list of devices that can be reset to Factory configuration. Select the device from the list, press ✓ and confirm deletion,
- The device does not belong to the installation:
  - On TE330 device
    - Press on the physical addressing push button to detect the device,
  - On the TX100
    - Select Install. product outside of system from Reset menu,
    - Press ✓,
    - Select TP,
    - Press ✓.

After the operation the TX100 emits a beep and the 3 LED's on the product go out.
After a device reset, the installation must be learnt again in order to relocate the devices reset to Factory configuration.

Characteristics

Max. number of group addresses	254
Max. number of links	255

Bus presence test

To check the presence of the bus, remove the front panel and press the physical addressing push button located on the product BCU.

Indicator ON = Bus presence

Important = Press the button again to exit this mode