CHORUS

KNX single-phase energy meter with direct connection

GWA9801

Technical Manual

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1 Introduction

The device acts as a power meter.
It has a built-in meter for measuring the following electric values and sending them on the BUS: active energy consumed and produced, active/reactive/apparent power, RMS voltage, RMS current, power frequency and factor. Some of these values are also shown directly on the display.

Up to 20 absorption limit thresholds can be set and monitored; with the monitoring of the instantaneous power (on the basis of power threshold values), signals can be sent when the limit thresholds are exceeded and a count can be made for the time the measured power remains above the threshold or how often it exceeds the limit.

The device can only be configured in “system mode” via ETS.

To make this manual easier to read, all the parameters and communication objects implemented by the device are grouped in different paragraphs, each of which represents the relative configuration menu in the ETS database.

2 Application

The main functions implemented in the application program are:

- Measurement of the electric values active energy consumed and produced, active/reactive/apparent power, RMS voltage, RMS current, power frequency and factor.
- Setting of the primary and differential counters for active consumed and produced energy, with the possibility to define the initial value and to reset.
- Power thresholds: up to 20 absorption limit threshold levels can be set and monitored, and a signal is sent on the BUS if these thresholds are exceeded; a count can be made for the time the measured power remains above the threshold or how often it exceeds the limit.

2.1 Association limits

Maximum number of group addresses: 254
Maximum number of associations: 254

This means that up to 254 group addresses can be defined, and up to 254 associations can be made (between communication objects and group addresses).

3 *"Information"* menu

The **Information** menu reminds the user, in operating terms, how to access the PROG menu in order to activate the programming mode of the physical or individual address of the device, and how to return from this menu to the RUN menu (long press on the UP and DOWN push-buttons).

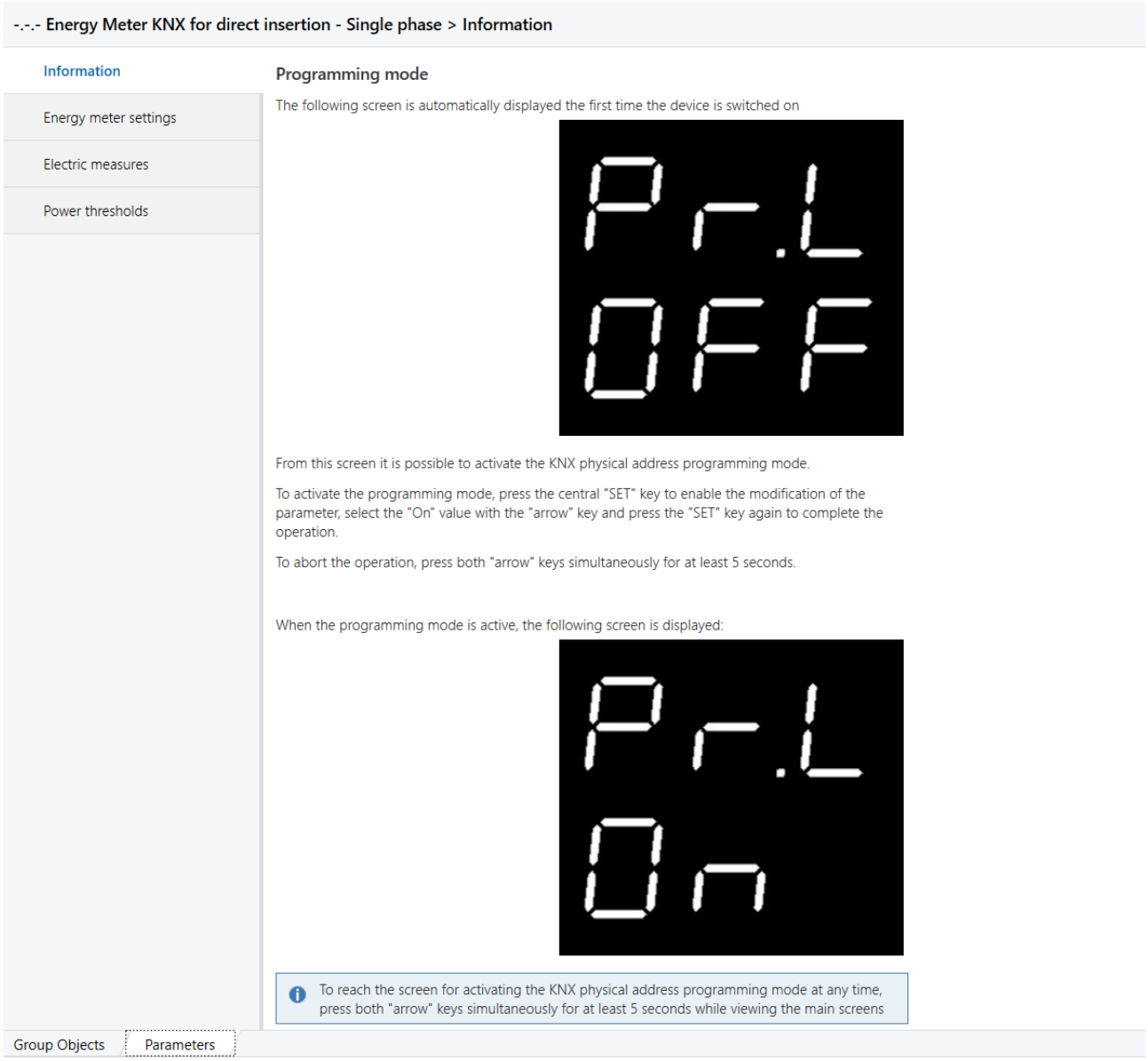


Fig. 3.1

☞ For more information, refer to paragraph 7.2 “Accessing the PROG status and firmware version” in the annex, along with the User Manual.

4 *"Energy meter settings"* menu

The **Energy meter settings** menu contains just one parameter for configuring the transmission of telegrams on the BUS following a BUS voltage failure and reset, to avoid a surge in messages and the risk of them colliding.
The basic structure of the menu is as follows:

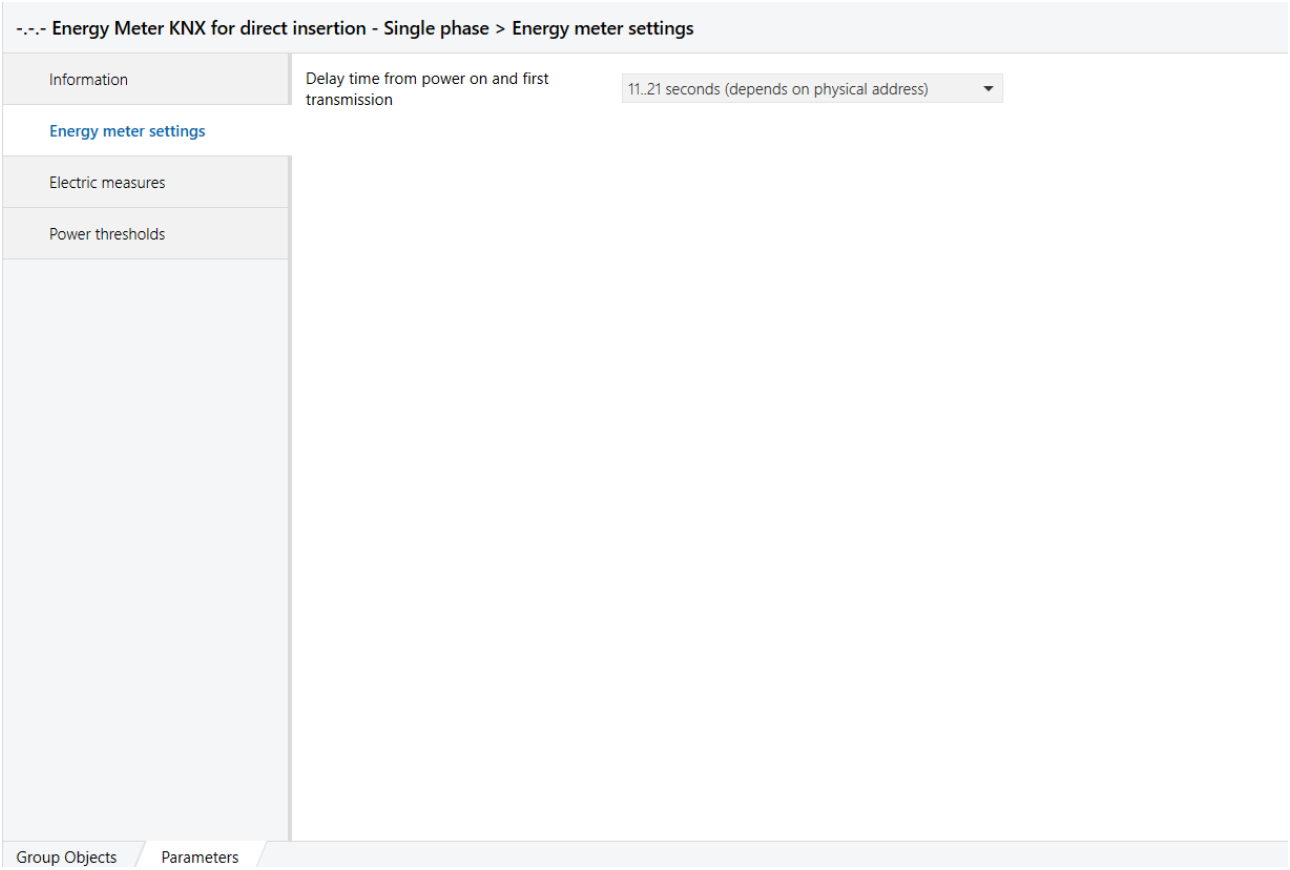


Fig. 4.1: "Energy meter settings" menu

4.1 Parameters

4.1.1 Delay time from power on and first transmission

To ensure that, with several devices in the line, the telegrams sent by the various devices do not collide when the BUS voltage is reset, you can define a time limit after which the device can transmit the telegrams on the BUS following a BUS voltage failure/reset. The **"Delay time from power on and first transmission"** parameter is used to define this delay.
The values that can be set are:

- **11..21 seconds (depends on physical address)** **(default value)**
- 5..9 seconds (depends on physical address)
- 11 seconds
- 13 seconds
- 15 seconds
- 17 seconds
- 19 seconds
- 21 seconds
- no delay

If the values **11..21 seconds (depends on physical address)** and **5..9 seconds (depends on physical address)** are set, the device automatically calculates the transmission delay using an algorithm that examines the physical address of the device itself; the values indicated (11/21 or 5/9) indicate the minimum and maximum limits of the value range that can be calculated.

Note that this parameter therefore merely sets a delay for transmitting the telegrams in the first few seconds after the first switch-on. It does not in any way hamper the user's interaction with the graphic interface of the device.

The delay following the reset of the 230V supply voltage - rather than just the BUS voltage - may be different even if the same value is set, because in the first case the device must actually start up while in the second it might already be active if the 230V supply hasn't failed.

5 *"Electric measures"* menu

The **Electric measures** menu contains the parameters for enabling and setting the conditions for sending the electric measurements detected for the load connected to the device. This menu is always visible. The structure of the menu is as follows:

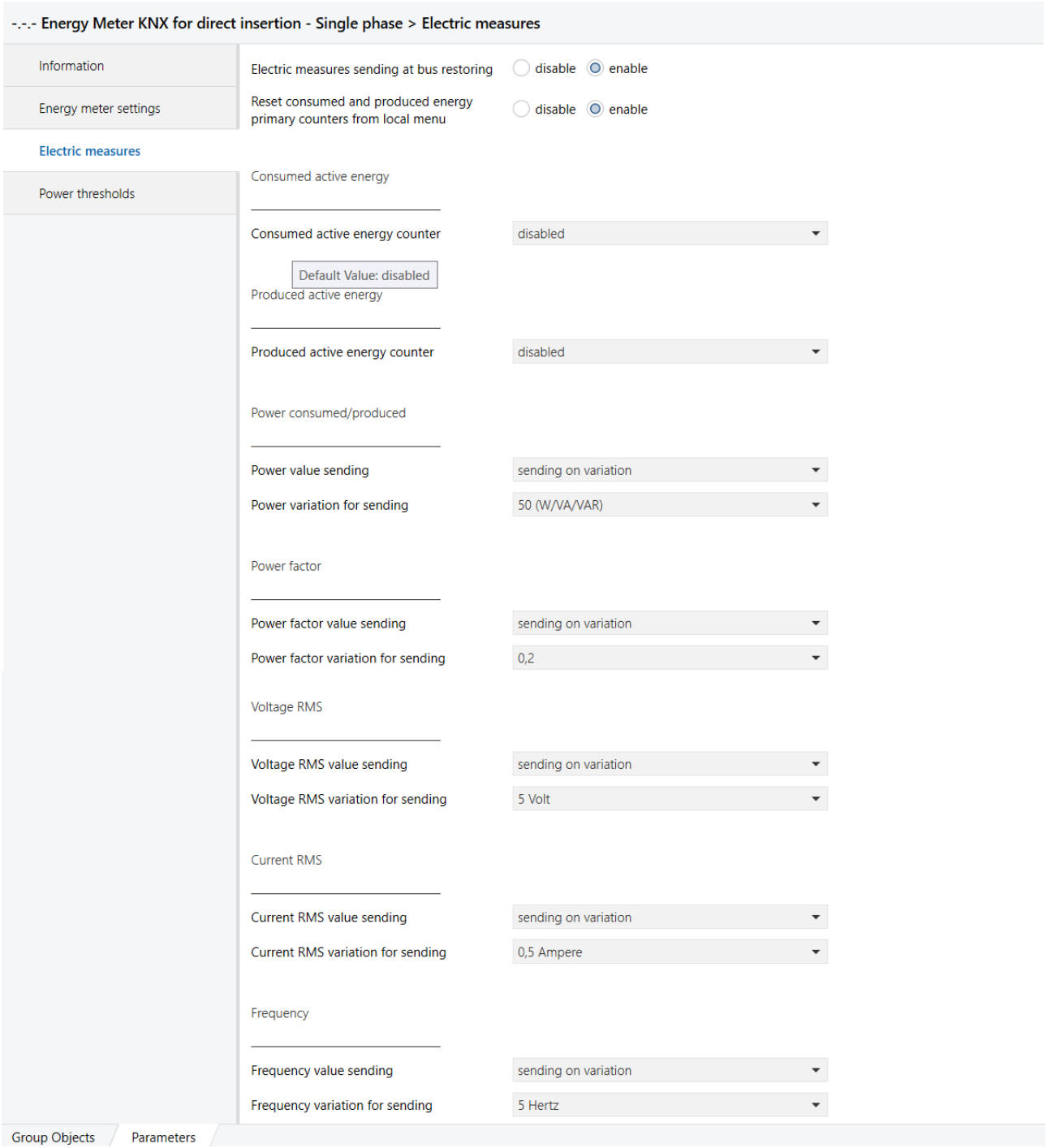


Fig. 5.1: "Electric measures" menu

The device has a built-in meter for measuring the following electric values: consumed active energy, active/reactive/apparent power, RMS voltage, RMS current and power factor.
NB: the energy count is made even without the BUS voltage, as long as the device is powered.

☞ The energy counters (energy produced and consumed) can be reset: by going to the energy counter display page and pressing the SET push-button for at least 5 seconds until the required page appears.

Press SET again to reset the counter, or press the arrow push-buttons (or wait for the inactivity time-out) to annul the reset.

The following parameters are used to configure the ways of measuring and sending the various values.

5.1 Parameters

5.1.1 Electric measures sending at bus restoring

The **"Electric measures sending at bus restoring"** parameter determines whether the communication objects for signalling the electric measurements (configured to be transmitted on variation) must be transmitted on BUS voltage reset as well. The parameter can have the following values:

- disable
- **enable** **(default value)**

5.1.2 Reset consumed and produced energy primary counters from local menu

There are two different counters for the consumed and produced energy values:

Primary counter
- The energy count is always active
- The initial value can be defined (a value that might be different from 0)
- Overflow value = maximum permitted by the counter
- It can be reset (reinitialised)

Differential counter
- The energy count can be activated/stopped via a communication object (e.g. the consumption is measured within a defined time band managed by a KNX clock)
- The initial value is always 0
- The overflow value can be set (a value that might be different from the maximum permitted by the counter)
- It can be reset (reinitialised)

The **"Reset consumed and produced energy primary counters from local menu"** parameter enables the reset of the primary counters for active consumed and produced energy via the local menu too (see User Manual).
The values that can be set are:

- disable
- **enable (default value)**

PARAMETERS RELATING TO "CONSUMED ACTIVE ENERGY"

5.1.3 Consumed active energy counter

The **"Consumed active energy counter"** parameter can be used to activate the count of the active energy consumed and define the format of the communication object used to send the counter value.
The values that can be set are:

- **disabled** **(default value)**
- enable primary counter

- enable primary and differential counters

If **enable primary counter** is selected, the **"Consumed energy counter format"**, **"Consumed energy primary counter init value"**, **"Reinitialize consumed energy counters"**, and **"Consumed energy primary counter sending condition"** parameters are displayed, along with the ***Consumed active energy primary counter*** communication object.

If **enable primary and differential counters** is selected, not only the parameters/communication objects listed previously (in relation to the primary counter) are displayed but also the **"Consumed energy differential counter overflow value"**, **"Start/stop consumed energy differential counter from bus"**, and **"Consumed energy differential counter sending condition"** parameters and the ***Consumed active energy differential counter*** communication object.

5.1.4 Consumed energy counter format

The capacity of the primary and differential counters used for the energy count must be sufficient to measure the energy in KNX coding in kWh (maximum value = 2147483647 kWh). The **"Consumed energy counter format"** parameter defines the dimension and coding of the communication object used to transmit the value of the primary and differential counters (if enabled). The values that can be set are:

- **watthour (Wh) (default value)**
- kilowatthour (kWh)

The value set for this item will define the format of the ***Consumed active energy primary counter*** and ***Consumed active energy differential counter*** objects, and the values that can be set for the **"Consumed energy primary counter init value"** and **"Consumed energy differential counter overflow value"** parameters.

5.1.5 Consumed energy primary counter init value

The **"Consumed energy primary counter init value"** parameter is used to set the initial value of the primary energy counter; when the primary counter is in overflow (i.e. it reaches its maximum value), the count is stopped but can be reinitialised using the relative BUS command on the object.
Depending on the value set for the **"Consumed energy counter format"** parameter, the values that can be set for this item will be different:

- If the format is **watthour (Wh)**, the format (Data Point Type) of the ***Consumed active energy primary counter*** communication object is 13.010 DPT_ActiveEnergy, and the values that can be set for the parameter are:
  - from **0 (default value)** to 2147483647 watthour, in steps of 1
- If the format is **kilowatthour (kWh)**, the format (Data Point Type) of the ***Consumed active energy primary counter*** communication object is 13.013 DPT_ActiveEnergy_kWh, and the values that can be set for the parameter are:
  - from **0 (default value)** to 2147483647 kilowatthour, in steps of 1

The device can use the ***Reset consumed active energy primary counter*** (Data Point Type: 1.015 DPT_Reset) communication object, the device can receive the primary counter reinitialisation commands that bring the counter back to the value set for the **"Consumed energy primary counter init value"** item; a value of "0" is ignored, whereas when the value "1" is received, the primary counter is reset at the initial value and the ***Overflow consumed active energy primary counter*** object is set at "0".

Via the ***Overflow consumed active energy primary counter*** (Data Point Type: 1.002 DPT_Bool) object, the device indicates the overflow of the primary counter. When an overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

5.1.6 Consumed energy primary counter sending condition

The **"Consumed energy primary counter sending condition"** parameter defines the conditions for sending the current primary counter value. The values that can be set are:

- sending on request
- **sending on variation** **(default value)**
- sending periodically
- sending on variation and periodically

Selecting **sending on variation** or **sending on variation and periodically**, visualises the parameter **"Consumed energy primary counter variation for sending"** whereas selecting **sending periodically** o **sending on variation and periodically** visualises the parameter **"Consumed energy primary counter sending period (minutes))"**.
If **sending on request** is selected, no new parameter is enabled because the primary counter value is not sent spontaneously by the device; only in the case of a status read request (e.g. from a supervisor) will it send the user a telegram in response to the command received, giving information about the current value of the primary counter.
If the sending condition of the primary counter is different from **sending on request**, the value of the counter is sent after a BUS voltage reset in order to update any connected devices.

5.1.7 Consumed energy primary counter variation for sending

The **"Consumed energy primary counter variation for sending"** parameter is visible if the primary counter value is sent with a change. It defines the minimum count variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- 10 Wh
- 20 Wh
- **50 Wh** **(default value if the counter format is "Wh")**
- 100 Wh
- 200 Wh
- 500 Wh
- **1000 Wh** **(default and ONLY value that can be set from the database if the counter format is "kWh")**

5.1.8 Consumed energy primary counter sending period (minutes)

The **"Consumed energy primary counter sending period (minutes)"** parameter is visible if the primary counter value is sent periodically. It defines the frequency for spontaneously sending telegrams indicating the current primary counter value. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

In the event of a voltage failure, the primary counter value is saved in a non-volatile memory so it can be reset when the power supply returns.

5.1.9 Reinitialize consumed energy counters

If the device configuration needs to be updated, and the ETS database downloaded again, you can indicate whether the energy counter value (primary and differential) must be reinitialised or not via the **"Reinitialize consumed energy counters"** parameter. The values that can be set are:

- **no** **(default value)**
- yes

By setting **no**, the counter values are saved in a non-volatile memory and reset when the device is relaunched.

5.1.10 Consumed energy differential counter overflow value

The **"Consumed energy differential counter overflow value"** parameter is used to set the maximum value of the differential active energy counter; in fact, unlike the primary counter, it is possible to set the maximum count value - i.e. the value beyond which the differential counter is in an overflow condition.
Depending on the value set for the **"Consumed energy counter format"** parameter, the values that can be set for this item will be different:

- If the format is **watthour (Wh)**, the format (Data Point Type) of the ***Consumed active energy differential counter*** communication object is 13.010 DPT_ActiveEnergy, and the values that can be set for the parameter are:

  - from 0 to **2147483647 (default value)** watthour, in steps of 1

- If the format is **kilowatthour (kWh)**, the format (Data Point Type) of the ***Consumed active energy differential counter*** communication object is 13.013 DPT_ActiveEnergy_kWh, and the values that can be set for the parameter are:

  - from 0 to **2147483647 (default value)** kilowatthour, in steps of 1

5.1.11 Consumed energy differential counter sending condition

The **"Consumed energy differential counter sending condition"** parameter defines the conditions for sending the current differential counter value. The values that can be set are:

- sending on request
- **sending on variation** **(default value)**
- sending periodically
- sending on variation and periodically

Selecting **sending on variation** or **sending on variation and periodically** visualises the **"Consumed energy differential counter variation for sending"** parameter, whereas selecting **sending periodically** or **sending on variation and periodically** visualises the **"Consumed energy differential counter sending period (minutes)"** parameter.
If **sending on request** is selected, no new parameter is enabled because the differential counter value is not sent spontaneously by the device; only in the case of a status read request (e.g. from a supervisor) will it send the user a telegram in response to the command received, giving information about the current value of the differential counter.
If the sending condition of the differential counter is different from **sending on request**, the value of the counter is sent after a BUS voltage reset in order to update any connected devices.

5.1.12 Consumed energy differential counter variation for sending

The **"Consumed energy differential counter variation for sending"** parameter is visible if the differential counter value is sent with a change. It defines the minimum count variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- 10 Wh
- 20 Wh
- **50 Wh** **(default value if the counter format is "Wh")**
- 100 Wh
- 200 Wh
- 500 Wh
- **1000 Wh** **(default and ONLY value that can be set from the database if the counter format is "kWh")**

5.1.13 Consumed energy differential counter sending period (minutes)

The **"Consumed energy differential counter sending period (minutes)"** parameter is visible if the differential counter value is sent periodically. It defines the frequency for spontaneously sending telegrams indicating the current differential counter value. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

In the event of a supply voltage failure, the differential counter value is saved in a non-volatile memory so it can be reset when the power supply returns.

5.1.14 Start/stop consumed energy differential counter from bus

Unlike the primary counter, the differential counter can be started/stopped via a BUS command; this makes it possible, for example, to measure the consumption within a specific time band managed by another KNX device. The **"Start/stop consumed energy differential counter from bus"** parameter enables this function, making the dedicated communication object visible. The values that can be set are:

- **disable** **(default value)**
- enable

Selecting **enable** visualises the ***Trigger consumed active energy differential counter*** (Data Point Type: 1.010 DPT_Start) communication object, for receiving the count start ("1") / stop ("0") commands.
Following an ETS download, the count is started by default, regardless of whether or not its start/stop has been enabled via the BUS.

Via the ***Overflow consumed active energy differential counter*** (Data Point Type: 1.002 DPT_Bool) object, the device signals the overflow of the differential counter. When an overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device can use the ***Reset consumed active energy differential counter*** (Data Point Type: 1.015 DPT_Reset) communication object, the device can receive the differential counter reinitialisation commands that bring the counter back to 0 (initial value); a value of "0" is ignored, whereas when the value "1" is received, the differential counter is reset at "0" and the ***Overflow consumed active energy differential counter*** object is set at "0".

PARAMETERS RELATING TO "PRODUCED ACTIVE ENERGY"

5.1.15 Produced active energy counter

The **"Produced active energy counter"** parameter can be used to activate the count of the active energy produced and define the format of the communication object used to send the counter value.
The values that can be set are:

- **disabled** **(default value)**
- enable primary counter
- enable primary and differential counters

If **enable primary counter** is selected, the **"Produced energy counter format"**, **"Produced energy primary counter init value"**, **"Reinitialize produced energy counters"**, and **"Produced energy primary counter sending condition"** parameters are displayed, along with the ***Produced active energy primary counter*** communication object.

If **enable primary and differential counters** is selected, not only the parameters/communication objects listed previously (in relation to the primary counter) are displayed but also the **"Produced energy differential counter overflow value"**, **"Start/stop produced energy differential counter from bus"**, and **"Produced**

energy differential counter sending condition" parameters and the ***Produced active energy differential counter*** communication object.

5.1.16 Produced energy counter format

The capacity of the primary and differential counters used for the energy count must be sufficient to measure the energy in KNX coding in kWh (maximum value = 2147483647 kWh). The **"Produced energy counter format"** parameter defines the dimension and coding of the communication object used to transmit the value of the primary and differential counters (if enabled). The values that can be set are:

- **watthour (Wh) (default value)**
- kilowatthour (kWh)

The value set for this item will define the format of the ***Produced active energy primary counter*** and ***Produced active energy differential counter*** objects, and the values that can be set for the **"Produced energy primary counter init value"** and **"Produced energy differential counter overflow value"** parameters.

5.1.17 Produced energy primary counter init value

The **"Produced energy primary counter init value"** parameter is used to set the initial value of the primary energy counter; when the primary counter is in overflow (i.e. it reaches its maximum value), the count is stopped but can be reinitialised using the relative BUS command on the object.
Depending on the value set for the **"Produced energy counter format"** parameter, the values that can be set for this item will be different:

- If the format is **watthour (Wh)**, the format (Data Point Type) of the ***Produced active energy primary counter*** communication object is 13.010 DPT_ActiveEnergy, and the values that can be set for the parameter are:
  - from **0 (default value)** to 2147483647 watthour, in steps of 1
- If the format is **kilowatthour (kWh)**, the format (Data Point Type) of the ***Produced active energy primary counter*** communication object is 13.013 DPT_ActiveEnergy_kWh, and the values that can be set for the parameter are:
  - from **0 (default value)** to 2147483647 kilowatthour, in steps of 1

The device can use the ***Reset produced active energy primary counter*** (Data Point Type: 1.015 DPT_Reset) communication object, the device can receive the primary counter reinitialisation commands that bring the counter back to the value set for the **"Produced energy primary counter init value"** item; a value of "0" is ignored, whereas when the value "1" is received, the primary counter is reset at the initial value and the ***Overflow produced active energy primary counter*** object is set at "0".

Via the ***Overflow produced active energy primary counter*** (Data Point Type: 1.002 DPT_Bool) object, the device indicates the overflow of the primary counter. When an overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

5.1.18 Produced energy primary counter sending condition

The **"Produced energy primary counter sending condition"** parameter defines the conditions for sending the current primary counter value. The values that can be set are:

- sending on request
- **sending on variation (default value)**
- sending periodically

- sending on variation and periodically

Selecting **sending on variation** or **sending on variation and periodically** visualises the **"Produced primary counter energy variation for sending"** parameter, whereas selecting **sending periodically** or **sending on variation and periodically** visualises the **"Produced energy primary counter sending period (minutes)"** parameter.
If **sending on request** is selected, no new parameter is enabled because the primary counter value is not sent spontaneously by the device; only in the case of a status read request (e.g. from a supervisor) will it send the user a telegram in response to the command received, giving information about the current value of the primary counter.
If the sending condition of the primary counter is different from **sending on request**, the value of the counter is sent after a BUS voltage reset in order to update any connected devices.

5.1.19 Produced primary counter energy variation for sending

The **"Produced primary counter energy variation for sending"** parameter is visible if the primary counter value is sent with a change. It defines the minimum count variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- 10 Wh
- 20 Wh
- **50 Wh** **(default value if the counter format is "Wh")**
- 100 Wh
- 200 Wh
- 500 Wh
- **1000 Wh** **(default and ONLY value that can be set from the database if the counter format is "kWh")**

5.1.20 Produced energy primary counter sending period (minutes)

The **"Produced energy primary counter sending period (minutes)"** parameter is visible if the primary counter value is sent periodically. It defines the frequency for spontaneously sending telegrams indicating the current primary counter value. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

In the event of a voltage failure, the primary counter value is saved in a non-volatile memory so it can be reset when the power supply returns.

5.1.21 Reinitialize produced energy counters

If the device configuration needs to be updated, and the ETS database downloaded again, you can indicate whether the energy counter value (primary and differential) must be reinitialised or not via the **"Reinitialize produced energy counters"** parameter. The values that can be set are:

- **no** **(default value)**
- yes

By setting **no**, the counter values are saved in a non-volatile memory and reset when the device is relaunched.

5.1.22 Produced energy differential counter overflow value

The **"Produced energy differential counter overflow value"** parameter is used to set the maximum value of the differential active energy counter; in fact, unlike the primary counter, it is possible to set the maximum count value - i.e. the value beyond which the differential counter is in an overflow condition.
Depending on the value set for the **"Produced energy counter format"** parameter, the values that can be set for this item will be different:

- If the format is **watthour (Wh)**, the format (Data Point Type) of the ***Produced active energy differential counter*** communication object is 13.010 DPT_ActiveEnergy, and the values that can be set for the parameter are:

  - from 0 to **2147483647 (default value)** watthour, in steps of 1

- If the format is **kilowatthour (kWh)**, the format (Data Point Type) of the ***Produced active energy differential counter*** communication object is 13.013 DPT_ActiveEnergy_kWh, and the values that can be set for the parameter are:

  - from 0 to **2147483647 (default value)** kilowatthour, in steps of 1

5.1.23 Produced energy differential counter sending condition

The **"Produced energy differential counter sending condition"** parameter defines the conditions for sending the current differential counter value. The values that can be set are:

- sending on request
- **sending on variation** **(default value)**
- sending periodically
- sending on variation and periodically

Selecting **sending on variation** or **sending on variation and periodically** visualises the **"Produced energy differential counter variation for sending"** parameter, whereas selecting **sending periodically** or **sending on variation and periodically** visualises the **"Produced energy differential counter sending period (minutes)"** parameter.
If **sending on request** is selected, no new parameter is enabled because the differential counter value is not sent spontaneously by the device; only in the case of a status read request (e.g. from a supervisor) will it send the user a telegram in response to the command received, giving information about the current value of the differential counter.
If the sending condition of the differential counter is different from **sending on request**, the value of the counter is sent after a BUS voltage reset in order to update any connected devices.

5.1.24 Produced energy differential counter variation for sending

The **"Produced energy differential counter variation for sending"** parameter is visible if the differential counter value is sent with a change. It defines the minimum count variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- 10 Wh
- 20 Wh
- **50 Wh** **(default value if the counter format is "Wh")**
- 100 Wh
- 200 Wh
- 500 Wh
- **1000 Wh** **(default and ONLY value that can be set from the database if the counter format is "kWh")**

5.1.25 Produced energy differential counter sending period (minutes)

The **"Produced energy differential counter sending period (minutes)"** parameter is visible if the differential counter value is sent periodically. It defines the frequency for spontaneously sending telegrams indicating the current differential counter value. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

In the event of a supply voltage failure, the differential counter value is saved in a non-volatile memory so it can be reset when the power supply returns.

5.1.26 Start/stop produced energy differential counter from bus

Unlike the primary counter, the differential counter can be started/stopped via a BUS command; this makes it possible, for example, to measure the energy produced within a specific time band managed by another KNX device. The **"Start/stop produced energy differential counter from bus"** parameter enables this function, making the dedicated communication object visible. The values that can be set are:

- **disable** **(default value)**
- enable

Selecting **enable** visualises the ***Trigger produced active energy differential counter*** (Data Point Type: 1.010 DPT_Start) communication object, for receiving the count start ("1") / stop ("0") commands.
Following an ETS download, the count is started by default, regardless of whether or not its start/stop has been enabled via the BUS.

Via the ***Overflow produced active energy differential counter*** (Data Point Type: 1.002 DPT_Bool) object, the device signals the overflow of the differential counter. When an overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device can use the ***Reset produced active energy differential counter*** (Data Point Type: 1.015 DPT_Reset) communication object, the device can receive the differential counter reinitialisation commands that bring the counter back to 0 (initial value); a value of "0" is ignored, whereas when the value "1" is received, the differential counter is reset at "0" and the ***Overflow produced active energy differential counter*** object is set at "0".

PARAMETERS RELATING TO "POWER CONSUMED/PRODUCED"

5.1.27 Transmission of the power values

The device can calculate the instantaneous power consumed by the load connected to the channel contacts or produced in all its components (active, reactive and apparent), and signal the values via the ***Active power measured*** (Data Point Type 14.056 DPT_Value_Power), ***Reactive power measured*** (Data Point Type 14.xxx 4-byte float value) and ***Apparent power measured*** (Data Point Type 14.056 DPT_Value_Power) communication objects.
The conditions that determine the sending of the communication objects that signal the instantaneous consumed or produced power value can be set via the **"Power value sending"** parameter, which can have the following values:

- Disable sending
- Sending on request
- **Sending on variation** **(default value)**

If any value other than **Disable sending** is selected, the ***Active power measured***, ***Reactive power measured*** and ***Apparent power measured*** communication objects are displayed.

5.1.28 Power variation for sending

The **"Power variation for sending"** parameter is used to set the minimum variation needed to trigger the transmission of the communication objects that signal the instantaneous absorbed or produced power value. The setting is valid for all three power values. The parameter can have the following values:

- 5 (W/VA/VAR)

- 10 (W/VA/VAR)
- 20 (W/VA/VAR)
- **50 (W/VA/VAR)** **(default value)**
- 100 (W/VA/VAR)

PARAMETERS RELATING TO "POWER FACTOR"

5.1.29 Transmission of the power values

The device can signal the current value of the power factor of the input signal detected on the contacts, using the ***Power factor measured*** (Data Point Type 14.057 DPT_Value_Power_Factor) communication object. The conditions that determine the sending of the communication object can be set via the "**Power factor value sending"** parameter, which can have the following values:

- disable sending
- sending on request
- **sending on variation** (default value)

If any value other than "disabled" is selected, the ***Power factor measured*** communication object is displayed.

5.1.30 Power factor variation for sending

The **"Power factor variation for sending"** parameter is used to set the minimum variation needed to trigger the transmission of the communication object that signals the power factor. The parameter can have the following values:

- 0.1
- **0.2** **(default value)**
- 0.3
- 0.4

PARAMETERS RELATING TO "RMS VOLTAGE"

5.1.31 Voltage RMS value sending

The device can signal the current value of the RMS voltage detected on the channel contacts, using the ***Voltage RMS measured*** (Data Point Type 9.020 DPT_Value_Volt) communication object. The conditions that determine the sending of the communication object can be set via the **"Voltage RMS value sending"** parameter, which can have the following values:

- disable sending
- sending on request
- **sending on variation** **(default value)**

If any value other than **disable sending** is selected, the ***Voltage RMS measured*** communication object is displayed.

5.1.32 Voltage RMS variation for sending

The **"Voltage RMS variation for sending"** parameter is used to set the minimum variation needed to trigger the transmission of the communication object that signals the voltage value. The parameter can have the following values:

- 1 Volt
- 2 Volt
- **5 Volt** **(default value)**

- 10 Volt
- 15 Volt
- 25 Volt

PARAMETERS RELATING TO "RMS CURRENT"

5.1.33 Current RMS value sending

The device can signal the current value of the current absorbed by the load connected to the channel contacts, using the ***Current RMS measured*** (Data Point Type 9.021 DPT_Value_Curr) communication object. The conditions that determine the sending of the communication object that signals the absorbed current can be set via the **"Current RMS value sending"** parameter, which can have the following values:

- disable sending
- sending on request
- **sending on variation** **(default value)**

If any value other than **disable sending** is selected, the ***Current RMS measured*** communication object is displayed.

5.1.34 Current RMS variation for sending

The **"Current RMS variation for sending"** parameter is used to set the minimum variation needed to trigger the transmission of the communication object that signals the input voltage value. The parameter can have the following values:

- 0.1 Ampere
- 0.2 Ampere
- **0.5 Ampere** **(default value)**
- 1 Ampere
- 1.5 Ampere
- 2.5 Ampere

PARAMETERS RELATING TO "FREQUENCY"

5.1.35 Transmission of the frequency value

The device can signal the current value of the frequency of the input signal detected on the contacts, using the ***Frequency measured*** (Data Point Type 14.033 DPT_Value_Frequency) communication object. The conditions that determine the sending of the communication object can be set via the **"Frequency value sending"** parameter, which can have the following values:

- disable sending
- sending on request
- **sending on variation** **(default value)**

If any value other than **disable sending** is selected, the ***Frequency measured*** communication object is displayed.

5.1.36 Frequency variation for sending

The **"Frequency variation for sending"** parameter is used to set the minimum variation needed to trigger the transmission of the communication object that signals the frequency. The parameter can have the following values:

- 1 Hertz
- 2 Hertz
- **5** Hertz **(default value)**
- 10 Hertz

6 *"Power thresholds"* menu

Up to 20 absorption limit thresholds can be set and monitored; when one of the thresholds is exceeded, the device calculates how long the limit power remained above the threshold or how often it exceeded the limit.
The sub-menus for each of the 5 thresholds are made visible according to how the **"Power thresholds number to activate"** parameter in the **Power thresholds** menu is set.
The structure of the menu is as follows:

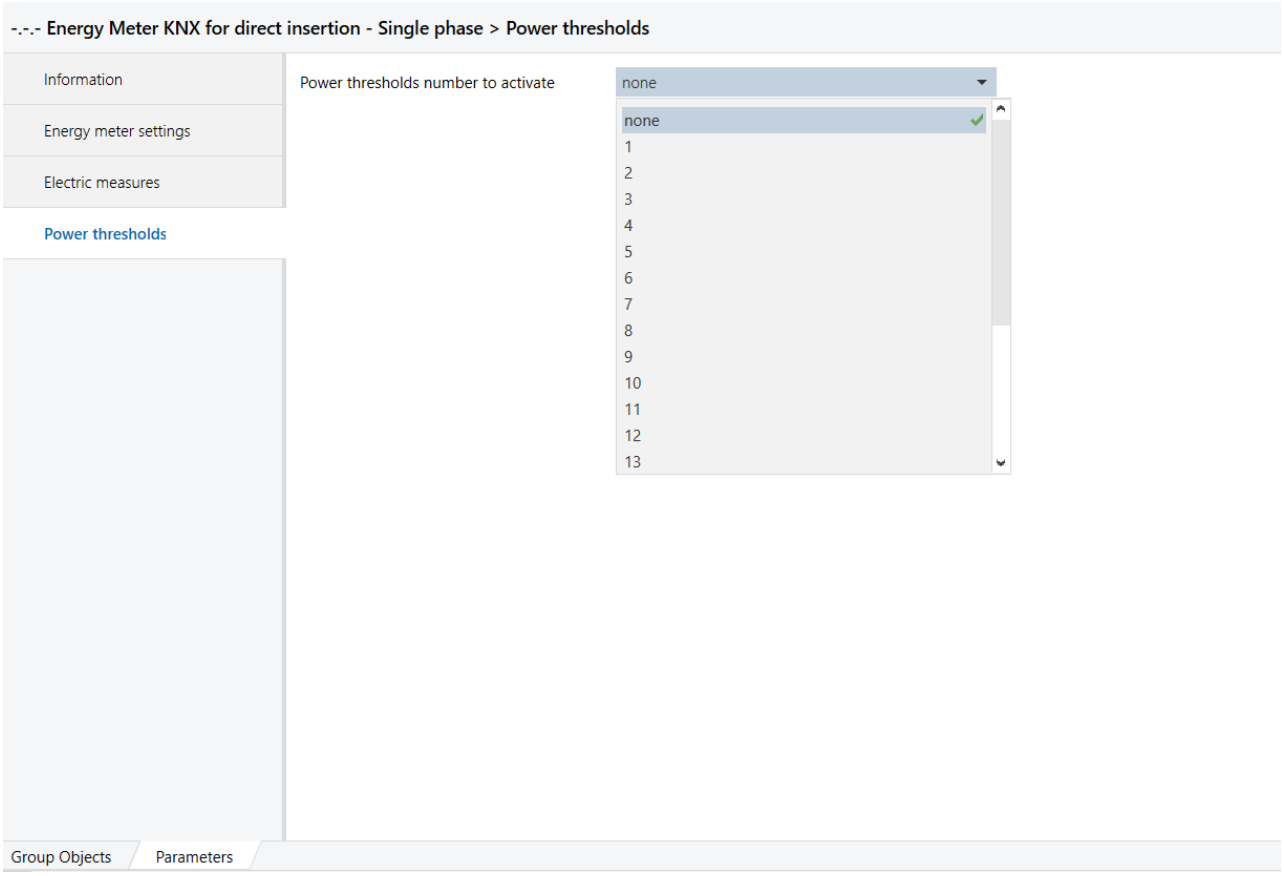


Fig. 6.1: "Power thresholds" menu

6.1 "Power thresholds menu parameters

6.1.1 Power thresholds number to activate

This parameter enables the power thresholds to be activated, from 1 to 20. The possible values are therefore:

- **None** **(default value)**
- 1
- 2
- 3
- 4
- 5
- …
- 20

For all the thresholds selected, the configuration menus of the parameters (and the corresponding objects) relating to each one will appear.

The ***Power threshold x enable*** (Data Point Type:1.002 DPT_Bool) and ***Power threshold x enable status*** (Data Point Type:1.003 DPT_Enable) communication objects are used respectively to receive the threshold activation commands and send the signals regarding the threshold activation status; the telegrams are sent via the ***Power threshold x enable status*** object following a BUS request, spontaneously with each threshold enabling status variation, and when the BUS voltage is reset.

6.2 "Power thresholds X menu parameters

For each threshold enabled, the following "Power thresholds X" menu appears with the following parameters:

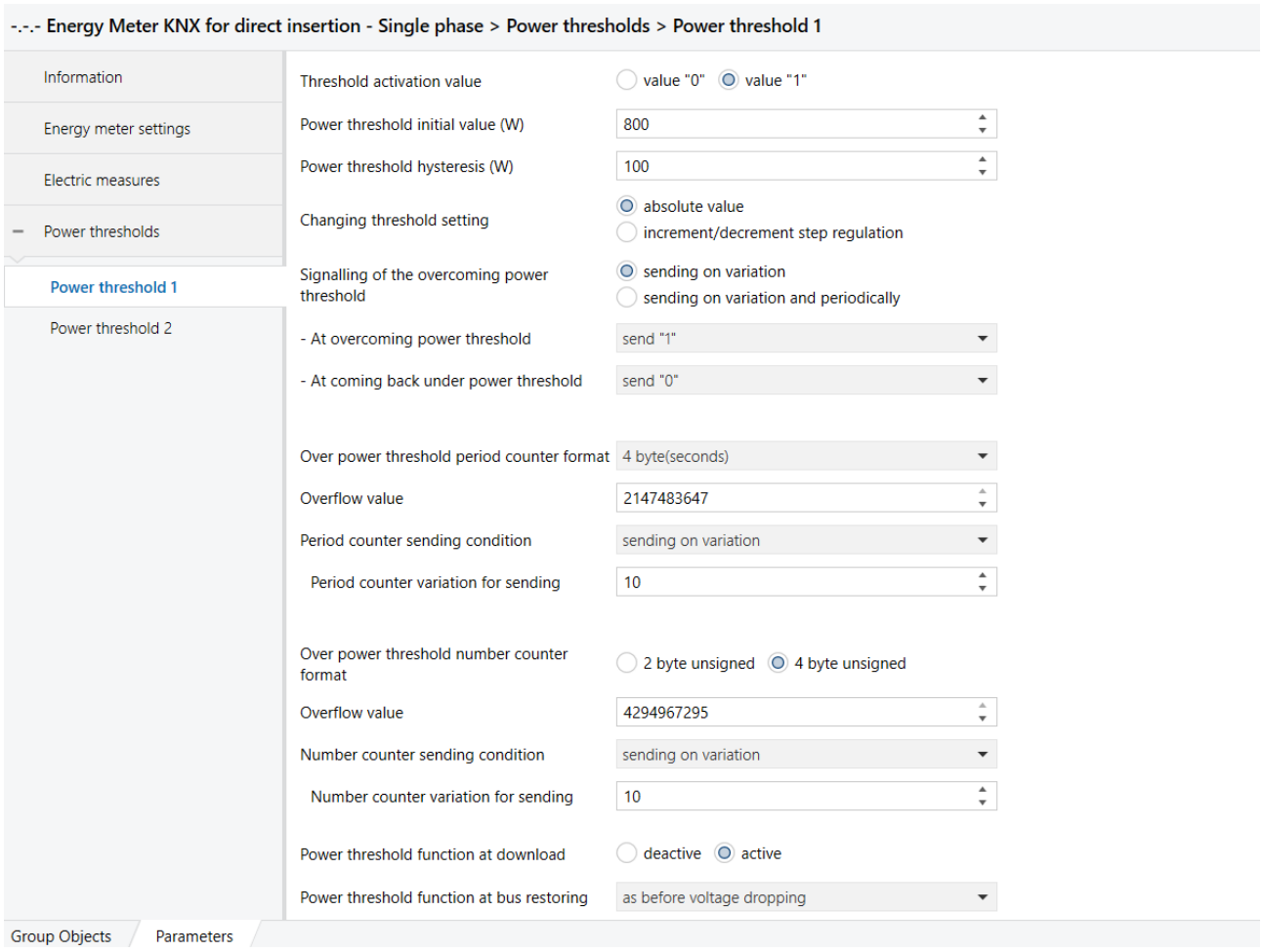


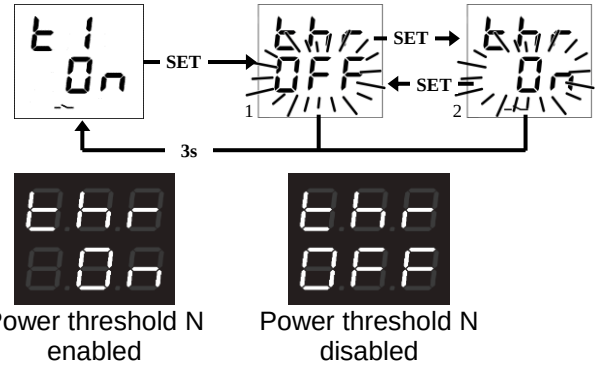
Fig. 6.2: "Power thresholds X" menu

6.2.1 Threshold activation value

The **"Threshold activation value"** parameter determines which logic value received via the ***Power threshold x enable*** communication object will activate the power threshold; the arrival of the opposite value will deactivate the threshold. The possible values are:

- value "0"
- **value "1"** **(default value)**

☞ To activate or deactivate the power threshold directly on the device (from the page showing the status of the corresponding threshold), press the SET/MODE push-button several times until the required option is displayed.

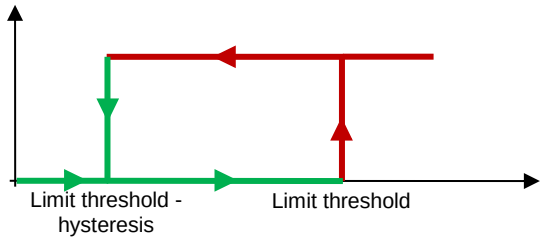


Power threshold N enabled

Power threshold N disabled

When the power threshold is exceeded, the symbol is permanently visualised on the display page for the corresponding threshold; the symbol turns off when the power value drops below the threshold value minus the set hysteresis.

The power threshold is managed using a hysteresis cycle, which means there are two values indicating when the threshold is exceeded, rather than one:



The limit is considered “exceeded” when the measured power value is higher than the “Limit threshold” value; when the power value falls below the “Limit threshold - hysteresis” value, the limit is considered “not exceeded”.

6.2.2 Power threshold initial value (W)

The **“Power threshold initial value (W)”** parameter sets the initial value of the power threshold in Watt (that can be modified via the BUS if necessary, using the dedicated communication object). The parameter can assume the following values:

- from -8000 to 8000 in steps of 1 **(default value 800)**

6.2.3 Power threshold hysteresis (W)

The **“Power threshold hysteresis (W)”** parameter sets the hysteresis value to be subtracted from the limit threshold to define the “limit not exceeded” value. This parameter can assume the following values:

- from 1 to 8000 in steps of 1 **(default value 100)**

Of course, the values that are set must be coherent - i.e. they must respect the rules:

- **+ 8001W > Threshold value > Hysteresis** for threshold values **> 0**
- **- 8001W < Threshold value < Hysteresis** for threshold values **< 0**

Note that, in the case of a negative threshold value, the limit is considered “exceeded” when the measured power value is lower than the “Limit threshold” value; when the power value rises below the “Limit threshold - hysteresis” value, the limit is considered “not exceeded”.

If this rule is not respected after ETS download, the default values are used.

6.2.4 Changing threshold setting

The **“Changing threshold setting”** parameter defines the format of the communication object needed to set the limit threshold via a BUS telegram. The values that can be set are:

- **absolute value** **(default value)**
- increment/decrement step regulation

Selecting **absolute value** visualises the ***Power threshold x value input*** (Data Point Type 14.056 DPT_Value_Power) communication object, that can be used to set the limit threshold value via the BUS. Once the threshold value has been received via the BUS, make sure it is valid (and therefore respects the two rules above); if it isn't, the telegram is ignored.

Selecting **increment/decrement step regulation** visualises the **“Regulation step of threshold by bus”** parameter and the ***Power threshold x regulation*** (Data Point Type: 1.007 DPT_Step object). If the value “1” is received on this object, the limit threshold value will be increased by the value defined in the **“Regulation step of threshold by bus”** parameter; if the value “0” is received, the limit threshold value will be decreased by the value defined in the **“Regulation step of threshold by bus”** parameter.

Before implementing the modification, the device checks that the new threshold value (in the increase/decrease command received via the BUS) is valid (and therefore respects the two rules above); if it isn't, the increase/decrease step is limited to the maximum/minimum permitted.

6.2.5 Regulation step of threshold by bus

The **“Regulation step of threshold by bus”** parameter defines the increase/decrease step of the limit threshold value following the arrival of a command on the relative regulation object. The values that can be set are

- from 1 to 250 in steps of 1 **(default value 100)**

The current value of the power limit threshold is transmitted on the BUS via the ***Power threshold x actual value*** (Data Point Type 14.056 DPT_Value_Power) object. The feedback sending conditions are: following a BUS request, spontaneously at each threshold change, and on BUS voltage reset.

6.2.6 Signalling of the overcoming power threshold

The **“Signalling of the overcoming power threshold”** parameter is used to configure the way of signalling the exceeded limit threshold via the ***Over power threshold x*** communication object. The parameter can assume the following values:

- **sending on variation** **(default value)**
- sending on variation and periodically

The exceeded threshold signal is sent via the ***Over power threshold x*** (Data Point Type 1.002 DPT_Bool) communication object and the **“At overcoming power threshold”** and **“At coming back under power threshold”** parameters. If **sending on variation and periodically** is selected, the **“Period of signalling sending (minutes)”** parameter will also be visualised.

6.2.7 At overcoming power threshold

The **"At overcoming power threshold"** parameter is used to set the value to be sent when the defined limit is exceeded. The values that can be set are

- no action
- send "0"
- **send "1"** **(default value)**

6.2.8 At coming back under power threshold

The **"At coming back under power threshold"** parameter is used to set the value to be sent when the power returns below the limit threshold (taking the hysteresis into account as well). The values that can be set are

- no action
- **send "0"** **(default value)**
- send "1"

The ***Over power threshold x*** object is sent upon request, spontaneously on variation, periodically (if cyclical repetition is enabled) and when the BUS voltage is reset, but only if the power value is not within the hysteresis band (between *Limit threshold* and *Limit threshold - hysteresis*). When the threshold is disabled, the sending of the "limit threshold exceeded" signals is inhibited, but any change or feedback of the threshold value is still transmitted.

6.2.9 Period of signalling sending (minutes)

The **"Period of signalling sending (minutes)"** parameter is used to set the repetition frequency for the telegrams signalling when the absorption threshold has been exceeded. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

6.2.10 Over power threshold period counter format

The device can signal the count of the total time above the power threshold; this count is based on the consumed/produced power measurement. It is only made if the supply voltage is present; otherwise, the counter is not increased.
The count can still be made even if there is no BUS voltage. The counter used for the count can have different units of measurement depending on the format selected for transmitting the value on the KNX BUS; the **"Over power threshold period counter format"** parameter defines the dimension and coding of the communication object used to transmit the value of the counter, and therefore its measurement unit. The values that can be set are:

- **4 byte (seconds)** **(default value)**
- 2 byte (minutes)
- 2 byte (hours)

The value set for this item will define the values that can be set for the **"Overflow value"** parameter and the format of the ***Period counter over power threshold x*** communication object ***(unit of measurement: [s/min/h])***. The initial value is always 0, regardless of the format selected.

6.2.11 Overflow value

The **"Overflow value"** parameter is used to set the maximum value of the "period above limit threshold" counter; in fact, it is possible to set the maximum counter value - i.e. the value beyond which the counter is in an overflow condition.

Depending on the value set for the **"Over power threshold period counter format"** parameter, the values that can be set for this item will be different:

- If the counter format is **4 byte (seconds)**, the ***Period counter over power threshold x (s)*** (Data Point Type: 13.100 DPT_LongDeltaTimeSec) communication object is visible and the values that can be set for the above parameter are:

  - from 0 to **2147483647 (default value ≈ 68 years)**, in steps of 1

- If the counter format is **2 byte (minutes)**, the ***Period counter over power threshold x (min)*** (Data Point Type: 7.006 DPT_TimePeriodMin) communication object is visible and the values that can be set for the above parameter are:

  - from 0 to **65535 (default value ≈ 45.5 days)**, in steps of 1

- If the counter format is **2 byte (hours)**, the ***Period counter over power threshold x (h)*** (Data Point Type: 7.007 DPT_TimePeriodHrs) communication object is visible and the values that can be set for the above parameter are:

  - from 0 to **65535 (default value ≈ 7.4 years)**, in steps of 1

When the maximum value is reached, the count stops until a reset command is implemented.

Via the ***Overflow period counter over power threshold x*** (Data Point Type: 1.002 DPT_Bool) object, the device signals the overflow of the "period above power threshold" counter. When an overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device can use the ***Reset period counter over power threshold x***(Data Point Type: 1.015 DPT_Reset) communication object to receive the counter reinitialisation command that brings the count back to its initial value of 0; a value of "0" is ignored, whereas when the value "1" is received, the counter is reset at the initial value and the ***Overflow period counter over power threshold x*** object is set at "0".

6.2.12 Period counter sending condition

The **"Period counter sending condition"** parameter defines the conditions for sending the current value of the "period above absorption threshold" counter. The values that can be set are:

- sending on request
- **sending on variation** **(default value)**
- sending periodically
- sending on variation and periodically

Selecting **sending on variation** or **sending on variation and periodically** visualises the **"Period counter variation for sending"** parameter, whereas selecting **sending periodically** or **sending on variation and periodically** visualises the **"Counter sending period (minutes)"** parameter.

If **sending on request** is selected, no new parameter is enabled because the counter value is not sent spontaneously by the device; only in the case of a status read request (e.g. from a supervisor) will it send the user a telegram in response to the command received, giving information about the current value of the counter.

If the sending condition of the counter is different from **sending on request**, the value of the counter is sent after a BUS voltage reset in order to update any connected devices.

6.2.13 Period counter variation for sending

The **"Period counter variation for sending"** parameter is visible if the "period above threshold" counter value is sent on variation. It defines the minimum count variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- from 1 to 100 in steps of 1 **(default value 10)**

The unit of measurement of the minimum variation is the same as that set for the counter format.

6.2.14 Counter sending period (minutes)

The **"Counter sending period (minutes)"** parameter is visible if the "period above threshold" counter value is sent periodically. It defines the frequency for spontaneously sending telegrams indicating the current counter value. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

In the event of a voltage failure, the "period above threshold" counter value is saved in a non-volatile memory so it can be reset when the power supply returns.

6.2.15 Over power threshold number counter format

The device can signal the number of times that the threshold is exceeded.
The counter used to calculate how often the threshold is exceeded can have different units of measurement depending on the format selected for transmitting the value on the KNX BUS; the **"Over power threshold number counter format"** parameter defines the dimension and coding of the communication object used to transmit the value of the counter, and therefore its measurement unit. The values that can be set are:

- 2 byte unsigned
- **4 byte unsigned** **(default value)**

The value set for this item will define the values that can be set for the **"Overflow value"** parameter and the format of the ***Number counter over power threshold x*** communication object. The initial value is always 0, regardless of the format selected.

6.2.16 Overflow value

The **"Overflow value"** parameter is used to set the maximum value of the "threshold exceeded" counter; in fact, it is possible to set the maximum counter value - i.e. the value beyond which the counter is in an overflow condition.
Depending on the value set for the **"Over power threshold number counter format"** parameter, the values that can be set for this item will be different:

- If the counter format is **2 byte unsigned**, the ***Number counter over power threshold x (2 byte)*** (Data Point Type: 7.001 DPT_Value_2_Ucount) communication object is displayed and the values that can be set for the above parameter are:
  - from 0 to **65535 (default value)**, in steps of 1
- If the counter format is **4 byte unsigned**, the ***Number counter over power threshold x (4 byte)*** (Data Point Type: 12.001 DPT_Value_4_Ucount) communication object is displayed and the values that can be set for the above parameter are:
  - from 0 to **4294967295 (default value)**, in steps of 1

When the maximum value is reached, the count stops until a reset command is implemented.

Via the ***Overflow Number counter over power threshold x*** (Data Point Type: 1.002 DPT_Bool) object to indicate the overflow of the "exceeded absorption limit threshold number" counter. When an overflow occurs, a value of “1” is sent; a value of “0” is sent when the counter is reinitialised.

The device can use the ***Reset Number counter over power threshold x*** (Data Point Type: 1.015 DPT_Reset) communication object to receive the counter reinitialisation command that brings the count back to its initial value of 0. A value of “0” is ignored, whereas when the value “1” is received, the counter is reset at the initial value and the ***Overflow number counter power limit threshold x*** object is set at “0”.

6.2.17 Number counter sending condition

The **“Number counter sending condition”** parameter defines the conditions for sending the current value of the "exceeded threshold number" counter. The values that can be set are:

- sending on request
- **sending on variation** **(default value)**
- sending periodically
- sending on variation and periodically

Selecting **sending on variation** or **sending on variation and periodically** visualises the **“Period counter variation for sending”** parameter, whereas selecting **sending periodically** or **sending on variation and periodically** visualises the **“Counter sending period (minutes)”** parameter.
If **sending on request** is selected, no new parameter is enabled because the counter value is not sent spontaneously by the device; only in the case of a status read request (e.g. from a supervisor) will it send the user a telegram in response to the command received, giving information about the current value of the counter.
If the sending condition of the counter is different from **sending on request**, the value of the counter is sent after a BUS voltage reset in order to update any connected devices.

6.2.18 Period counter variation for sending

The **“Period counter variation for sending”** parameter is visible if the "exceeded absorption limit threshold number" counter value is sent on variation. It defines the minimum count variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- from 1 to 100 in steps of 1 **(default value 10)**

The unit of measurement of the minimum variation is the same as that set for the counter format.

6.2.19 Counter sending period (minutes)

The **“Counter sending period (minutes)”** parameter is visible if the "exceeded threshold number" counter value is sent periodically. It defines the frequency for spontaneously sending telegrams indicating the current counter value. The values that can be set are:

- from 1 to 255 in steps of 1 **(default value 15)**

In the event of a voltage failure, the "exceeded threshold number" counter value is saved in a non-volatile memory so it can be reset when the power supply returns.

6.2.20 Power threshold function at download

The **“Power threshold function at download”** parameter enables the power threshold following the application download from ETS. The possible values are:

- deactive
- **active** **(default value)**

6.2.21 Power threshold function at bus restoring

The **"Power threshold function at bus restoring"** parameter enables the power threshold function following a BUS voltage reset. The possible values are:

- deactive
- active
- **as before voltage dropping** **(default value)**

With **deactive**, the power threshold function is not activated when the BUS voltage is reset.

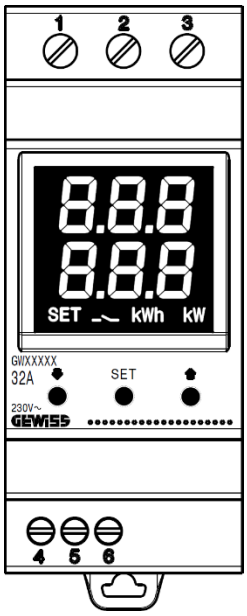
With **active**, the power threshold function is enabled with the current value.

With **as before voltage dropping**, the threshold activation status in force prior to the failure is maintained when the BUS voltage is reset.

7 Annex

The following notes may be useful for understanding how to access certain configuration menus of the GWA9801 device, using the push-buttons on the device itself and the relative information on the display.

7.1 Local menu and push-buttons on the GWA9801



The device has the 3 multi-function push-buttons shown below:

SET	MODE/SET push-button	• to activate the SET function for modifying the operating parameters • to activate/deactivate the load control function • to include/exclude loads • to confirm the parameter to be modified • to confirm the parameter value modification
⇧	UP push-button	• to see the next information item • to see the next parameter to be modified • to see the next parameter value
⇩	DOWN push-button	• to see the previous information item • to see the previous parameter to be modified • to see the previous parameter value

There are 3 possible device statuses:

1. normal operating mode (RUN)
2. parameter setting mode (SET)
3. programming mode (PROG).

☞ A long press on the SET/MODE push-button will take you from RUN status to SET status or vice versa.
☞ A long press on the UP and DOWN push-buttons simultaneously will take you from RUN status to PROG status or vice versa.

The operations explained below can be carried out in each of the 3 statuses.

The following paragraph explains how to access PROG status in order to program the physical (or individual) KNX address.

☞ ***To use the device push-buttons to access the menus for the RUN and SET statuses, and the relative info on the display, refer to the Programming Manual and the Installation Manual.***

7.2 Accessing the PROG status menu and the Firmware Version

The physical KNX address can only be programmed by accessing the relative “PROG status” menu via the device push-buttons, as indicated below.
With this procedure, you can also see the firmware version of the device.

☞ Programming status (PROG) is enabled with a long (>5 seconds) simultaneous press on the UP and DOWN push-buttons; from there, you can access the activation/deactivation functions for the physical address programming mode and see the firmware version.
☞ Once the PROG function has been enabled, the name of the function is shown in the 3 digits at the top and its current value in the three digits at the bottom. Use the DOWN and UP push-buttons to switch from one page to the next one or the previous one, and press SET/MODE to access the modification of the value for the selected function.
☞ In particular, when SET/MODE is pressed, the 3 digits showing the current function setting will flash on the display and the UP and DOWN push-buttons can be used to scroll through the various values.
☞ Once the value has been modified, it will flash and SET/MODE must be pressed to save the new setting; if the time-out (30 seconds) elapses with no action on the push-buttons, the value modification is annulled and the previous value is displayed again.

☞ From PROG status, a long press (>5 seconds) on the UP/DOWN push-buttons or the end of the time-out (1 minute) with no action on the push-buttons will trigger the return to RUN status.

The functions are listed below:

	▪ ***Physical address programming mode*** Used to activate/deactivate the programming mode for the physical address of the KNX device. The mode is active when the parameter setting is "On". VALUES: On, **Off (default value)** Once programming mode has been activated, press SET/MODE to see the message “Pr.L On” on the display. Physical address programming mode can only be quit by a direct action on the device (press SET/MODE to reset the OFF value, press the UP/DOWN push-buttons (>5 seconds) to quit PROG status) or by means of a device reset made by ETS (reset or relaunch command following the programming of the physical address or configuration parameters). Following a manual attempt to activate programming mode, with no BUS connection (or no voltage with the BUS connected), the specific “Err BUS” error screen will appear instead of “Pr.L On” to indicate that it is impossible to access programming mode; the previous screen - “Pr.L OFF” - will then return, to activate the mode. The error message is displayed for 3 seconds, then it disappears automatically. If a BUS failure is detected while programming mode is active, the device behaves in the same way as for the previous case: the error screen will appear and then programming mode will be automatically quit.
	▪ ***Firmware version*** The firmware version currently loaded is shown; there are no values to be set. Note that a long press on the SET/MODE push-button while the firmware versions are being displayed (via access to PROG status) does NOT activate the “Factory reset” procedure which, for safety reasons, can only be enabled when viewing the firmware version after device start-up. For the details, see paragraph 12.3 “*Device start-up procedure*”.

Note that the same message - “Pr.L On” - that indicates the activation of the physical address programming mode also appears on the display when the mode is activated via the BUS with a specific telegram sent by the ETS application (device LED - ON). In the same way (and in keeping with normal manual management), the deactivation of the mode via the BUS (device LED - OFF) will take you back to the previous message - “Pr.L OFF” - indicating that activation status has been abandoned. These two messages will be displayed cyclically if a telegram is sent via ETS to execute the alternated activation of this mode (device LED - FLASHING). With programming mode deactivated, the device returns to RUN status and visualises the main measured power page (quitting PROG status) with a long press (>5 seconds) on the UP/DOWN push-buttons or as a result of inactivity (time-out).

7.3 Device start-up procedure

The currently loaded firmware version is shown on the display when the device is started. This page will disappear after 5 seconds and the device will assume its normal (idle) operating mode.

To see the version again when the device is powered and working normally, go to PROG status (see the previous paragraph) and refer to the dedicated item.

7.3.1 Factory reset

When the firmware version is being displayed (only during the device start-up phase), a long press on SET/MODE will run a “factory reset” if the has been confirmed by the user.

When the pressure on SET/MODE is detected, the time-out (that automatically causes the version display page to disappear) is paused. If SET/MODE is not pressed before reaching the time needed to enable the factory reset procedure, the device continues its normal time-out count to disable the firmware version page.

A long press on SET/MODE (> 10 seconds) activates the “factory reset” procedure; the message “Fct rES” will appear on the display.

The pressing of the SET/MODE push-button confirms the reset operation and the display shows the message “donE” for 2 seconds before the device is reactivated. The pressing of the UP/DOWN push-buttons annuls the operation and returns the device to the firmware version screen while it is being reactivated.

☞ **After a factory reset, all the factory parameters are reset along with the physical factory address, and the FDSK (Factory Default Set-up Key) is reactivated.**

Attention! If an application is downloaded from ETS with KNX Secure enabled, it will not be possible to download another one from a different ETS project without first making a factory reset via the local menu. The FDSK reset procedure is indispensable; it isn't enough just to delete the application from the device via ETS.

If the time-out (30 seconds) elapses without the user pressing the push-buttons while the confirmation page is being displayed, the visualisation of the factory reset procedure is deactivated and the device returns to the firmware version screen while it is being reactivated.

7.3.2 Procedure for activating the physical address programming mode

If the device has no physical address configured, the physical address programming launch screen will be displayed after the visualisation of the firmware version. This page is used to activate/deactivate the programming mode for the physical address of the KNX device.

It can only be removed by pressing the UP or DOWN push-button.

- ☞ The physical address programming activation page can be called up by accessing PROG status.
- ☞ For more details, see paragraph 12.2 above.

7.4 Device malfunctioning error feedback – No BUS connection

During normal operation, the device can detect certain malfunctions not resulting directly from its configuration, but which may prevent it from working properly. These malfunctions are signalled on the display as operating errors, via the central digits:

Malfunction detected	**Information on the display**
Warning of lack of KNX BUS connection. This malfunction blocks all communication on the BUS, and therefore all BUS signalling or command functions. The KNX BUS connection must be checked to reset correct operation.	Err bUS 

Once the error has been detected and signalled on the display, the information remains on the display and the device functions are blocked because this type of error is critical for device operation. The user can quit the error screen by pressing the UP or DOWN push-buttons and thus return to the normal device screens. When the inactivity time-out has elapsed (1 minute), the error screen is displayed again.

The error will only stop being displayed when the condition linked to it is no longer detected. To ensure that this condition cannot arise again, it may be necessary to call in the installation technician.

7.5 Feedback of ETS download in progress

During the ETS download, the message “EtS dL” is shown on the device display.

- ☞ In this phase, no operations can be carried out on the device using the push-buttons.

At the end of the download, the device is restarted with the normal procedure explained in paragraph 12.3 "Device start-up procedure".

7.6 Feedback of application deletion by ETS

During the deletion of the application program (or application) by ETS, the message “EtS dL” will appear on the screen and will remain if the device is not relaunched at the end of the procedure.

In this status, the normal download of the application from ETS can be resumed without relaunching the device as long as the physical address has not been deleted as well.

If the physical address has been deleted, the device must be relaunched.

☞ In both deletion situations (the device is relaunched by ETS without the physical address having been deleted, or it is switched off and then back on again), the message “P ---“ will appear on the device to show that the application has been deleted and a new download must be made. In any case, access the PROG menu and activate programming mode to reprogram the device via ETS or make a factory reset.

For more details about programming mode (PROG status) or factory reset, refer to the relative paragraphs.

8 Communication objects

The communication objects are listed in the following table:

Output objects:

#	OBJECT NAME	FUNCTION	DESCRIPTION	DATAPOINT TYPE
1	***Consumed active energy primary counter***	Value in watthour [Wh]	Indicates the current value of the primary counter for active consumed energy	13.010 DPT_ActiveEnergy
1	***Consumed active energy primary counter***	Value in kilowatthour [kWh]	Indicates the current value of the primary counter for active consumed energy	13.013 DPT_ActiveEnergy_kWh
2	***Overflow consumed active energy primary counter***	Overflow status	Sends the primary counter overflow signal	1.002 DPT_Bool output communication object is made visible)
4	***Consumed active energy differential counter***	Value in watthour [Wh]	Indicates the current value of the differential counter for active consumed energy	13.010 DPT_ActiveEnergy
4	***Consumed active energy differential counter***	Value in kilowatthour [kWh]	Indicates the current value of the differential counter for active consumed energy	13.013 DPT_ActiveEnergy_kWh
6	***Overflow consumed active energy differential counter***	Overflow status	Sends the differential counter overflow signal	1.002 DPT_Bool output communication object is made visible)
8	***Produced active energy primary counter***	Value in watthour [Wh]	Indicates the current value of the primary counter for active produced energy	13.010 DPT_ActiveEnergy
8	***Produced active energy primary counter***	Value in kilowatthour [kWh]	Indicates the current value of the primary counter for active produced energy	13.013 DPT_ActiveEnergy_kWh
9	***Overflow produced active energy primary counter***	Overflow status	Sends the primary counter overflow signal	1.002 DPT_Bool output communication object is made visible)
11	***Produced active energy differential counter***	Value in watthour [Wh]	Indicates the current value of the differential counter for active consumed energy	13.010 DPT_ActiveEnergy
11	***Produced active energy differential counter***	Value in kilowatthour [kWh]	Indicates the current value of the differential counter for active consumed energy	13.013 DPT_ActiveEnergy_kWh
13	***Overflow produced active energy differential counter***	Overflow status	Sends the differential counter overflow signal	1.002 DPT_Bool output communication object is made visible)
15	***Active power measured***	Value in Watt [W]	Indicates the current value of active consumed or produced power	14.056 DPT_Value_Power
16	***Reactive power measured***	Value in reactive volt-ampere [var]	Indicates the current value of reactive consumed or produced power	14.xxx 4-byte float value
17	***Apparent power measured***	Value in volt-ampere [va]	Indicates the current value of apparent consumed or produced power	14.xxx 4-byte float value
18	***Power factor measured***	Value -1 .. +1	Indicates the current value of the power factor	14.057 DPT_Value_Power_Factor
19	***Voltage RMS measured***	Value in Volt [V]	Indicates the current value of the mains voltage	9.020 DPT_Value_Volt
20	***Current RMS measured***	Value in Ampere [A]	Indicates the current value of the current	9.021 DPT_Value_Curr

21	***Frequency measured***							Value in Hertz [Hz]	Indicates the current value of the mains frequency	14.033 DPT_Value_Frequency
23	34	45	56	67	…	232	***Power threshold x enable status***	Active/Deactive	Indicates the activation status of the load absorption limit threshold	1.003 DPT_Enable
25	36	47	58	69	…	234	***Power threshold x actual value***	Value in Watt [W]	Indicates the current value of the load absorption limit threshold	14.056 DPT_Value_Power
26	37	48	59	70	…	235	***Over power threshold x***	1/0 value	Sends the signal associated with the exceeded limit threshold	1.002 DPT_Bool output communication object is made visible)
27	38	49	60	71	…	236	***Period counter over power threshold x (s)***	Value 0 .. 2147483647 [s]	Sends the counter value (expressed in seconds)	13.100 DPT_LongDeltaTimeSec
27	38	49	60	71	…	236	***Period counter over power threshold x (min)***	Value 0 .. 65535 [min]	Sends the counter value (expressed in minutes)	7.006 DPT_TimePeriodMin
28	39	50	61	72	…	237	***Overflow period counter over power threshold x***	Overflow status	Sends the counter overflow signal	1.002 DPT_Bool output communication object is made visible)
30	41	52	63	74	…	239	***Number counter over power threshold X(2 byte)***	Value 0 .. 65535	Sends the counter value	7.001 DPT_Value_2_Ucount
30	41	52	63	74	…	239	***Number counter over power threshold X(4 byte)***	Value 0 .. 4294967295	Sends the counter value	12.001 DPT_Value_4_Ucount
31	42	53	64	75	…	240	***Overflow number counter power limit threshold X***	Overflow status	Sends the counter overflow signal	1.002 DPT_Bool output communication object is made visible)

The numbers of the X power threshold objects (from 1 to 20) are not all listed, but they are present.

Input objects:

#	OBJECT NAME	FUNCTION	DESCRIPTION	DATAPOINT TYPE
3	***Reset consumed active energy primary counter***	1=Reset / 0=No action	Receives the counter value reset command	1.015 DPT_Reset
5	***Trigger consumed active energy differential counter***	1=Start count / 0=Stop count	Receives the start/stop count commands for the differential counter	1.010 DPT_Start communication object
7	***Reset consumed active energy differential counter***	1=Reset / 0=No action	Receives the counter value reset command	1.015 DPT_Reset
10	***Reset produced active energy primary counter***	1=Reset / 0=No action	Receives the counter value reset command	1.015 DPT_Reset
12	***Trigger produced active energy differential counter***	1=Start count / 0=Stop count	Receives the start/stop count commands for the differential counter	1.010 DPT_Start communication object
14	***Reset produced active energy differential counter***	1=Reset / 0=No action	Receives the counter value reset command	1.015 DPT_Reset
22	33 44 55 66 … 231 ***Power threshold x enable***	Enable/Disable	Receives the power limit threshold activation/deactivation commands	1.002 DPT_Bool output communication object is made visible)
24	35 46 57 68 … 233 ***Power threshold X value input***	Value in Watt [W]	Receives the absorption limit threshold values	14.056 DPT_Value_Power
24	35 46 57 68 … 233 ***Power threshold X regulation***	1=Increase / 0=Decrease	Receives the increase/decrease commands for the power limit threshold value	1.007 DPT_Step object

29	40	51	62	73	…	238	***Reset period counter over power threshold X***	1=Reset / 0=No action	Receives the counter value reset command	1.015 DPT_Reset
32	43	54	65	76	…	241	***Reset number counter over power threshold X***	1=Reset / 0=No action	Receives the counter value reset command	1.015 DPT_Reset

The numbers of the X power threshold objects (from 1 to 20) are not all listed, but they are present.

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