LUZEN ONE

Universal Dimmer

ZN1DI-4001

Programme version: 2.3

Manual edition: a

INDEX

1. INTRODUCTION

1.1. LUZEN ONE

LUZEN ONE is a universal 1-channel Dimmer that allows dimming different light points connected to its output channel.

Among its functions, these are the most out-standing:

- 1 output channel, of up to **400 W**.

- Setting up **timers** and **flashing** sequences.

- Setting up **scenes** and additional **sequences**.

- Customizing **Secondary ON/OFF** and **Memory ON/OFF** controls, as well as **blocking** the output channel.

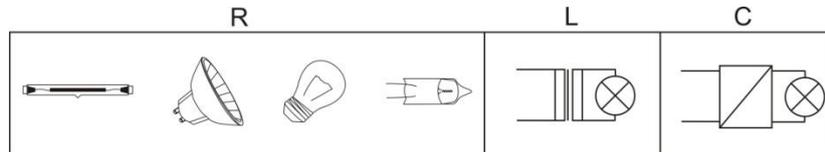- One multi-operational module with up to **5 logical functions**.
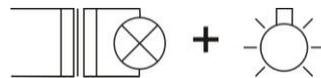

Figure 1.1. LUZEN ONE Dimmer

1.2. LOAD TYPES

LUZEN ONE allows combining different types of loads.

Capacitive, inductive and conventional ohmic/resistive loads (with a maximum wattage of approximately 400 W / 400 VA) can be connected, keeping always in mind the following restrictions:

- With conventional transformers, the resistive load should not exceed 50%.
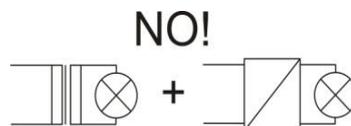

Inductive load + resistive load

- Conventional resistive/ohmic loads and loads with an electronic transformer can be combined with no restriction.
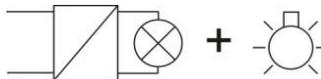
Capacitive load + Resistive load

- However, capacitive loads and electronic transformers **should never be connected** together with inductive loads (conventional transformers).

Inductive load + capacitive load

1.3. INSTALLATION

LUZEN ONE is connected to the KNX bus through the connecting terminal included with the device. Cables to the loads and to the main voltage are connected through plug-in terminals with a screw connection (provided with the device). These cables can be screwed into the terminal prior to installing the device itself, postponing to a later date the insertion of the terminal into the device.

Note: *All the devices installed next to the dimming actuator must be equipped at least with basic insulation.*

Figure 1.2 shows the connection scheme for LUZEN ONE.
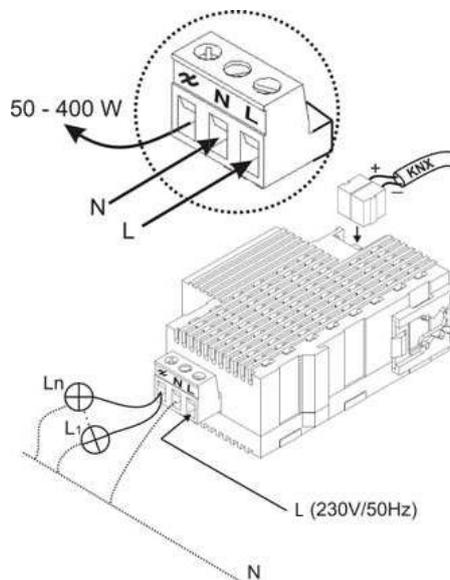
Figure 1.2. Connection scheme for LUZEN ONE

Further information about technical features in LUZEN ONE as well as about security and installation procedures can be found on the Dimmer **datasheet**, included in the original package of the device and also available at www.zennio.com.

Note: *Because of certain changes introduced into the plug-in terminal of the Dimmer, for devices with a serial number not later to **09AAP** we encourage downloading and reading the document "Technical note about terminals", available at the products-downloads section corresponding to LUZEN ONE, at our webpage* www.zennio.com.

2. CONFIGURATION

LUZEN ONE allows controlling and dimming light sources of different types connected to its output channel. Moreover, it is possible to set up a set of additional functionalities, which make this Dimmer a very versatile device:

- **ON/OFF:** basic ON/OFF and possibility of setting up a secondary ON/OFF and another one with state recovery (memory ON/OFF). All of them can be dimmed immediately or smoothly (progressive dimming).

- **Timer and flashing:** time-driven ON/OFF switches of the output channel.

- **Scenes:** possibility of configuring up to five scenes, so that different levels of luminosity (defined by parameter) can be reached easily.

- **Sequences:** possibility of enabling up to five different sequences and configuring each of their four steps in order to generate different luminosity situations.

- **Block:** option to enable/disable the control over the Dimmer output.

- **Auto OFF:** this functionality allows an automatic switch off of the load connected to the Dimmer output when its percentage of brightness is lower than a threshold level (established by parameter) during a predefined time.

- **Error identification:** LUZEN ONE is able to detect a series of anomalous situations that may occur on the load connected to the output channel: Open-circuit, Short-circuit, Overload, Overtemperature and Anomalous frequency.

- **Initial settings:** this functionality allows customizing the brightness status of the load connected to LUZEN ONE upon bus voltage recovery and upon load voltage recovery, as well as parameterizing the sending (immediate or with a delay) of the status to the KNX bus.

- **Logical functions:** module which allows configuring up to 5 logical functions, which can carry out up to 4 different binary operations each.

3. ETS PARAMETERIZATION

To begin parameterizing the LUZEN ONE Dimmer it is necessary to import, once the ETS application has been opened, the product database (version 2.3 of the application program).

Next, the device should be added to the project where desired. Right-clicking on the device and selecting "Edit parameters" allows beginning the parameter configuration.

A more detailed explanation about each of the different ETS parameters of LUZEN ONE can be found during the next sections.

3.1. DEFAULT CONFIGURATION

This section shows the default configuration of the device from which the parameterizing process starts.
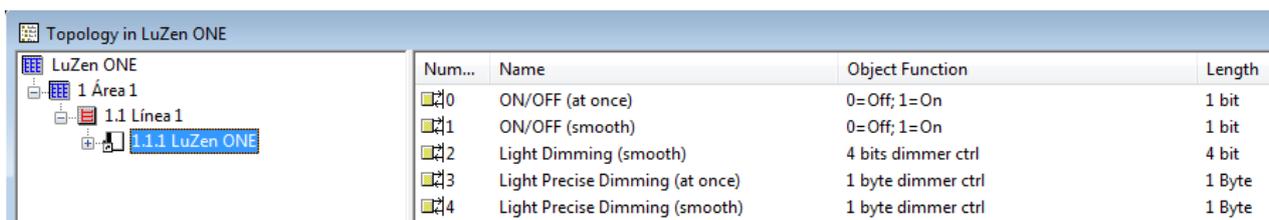
Figure 3.1. LUZEN ONE. Default topology

When accessing the parameter edition in LUZEN ONE for the first time, the following window will be shown:

Figure 3.2. Parameterization screen by default

As seen on figure 3.2, the parameterization screen contains two main tabs, which will be detailed during the next sections of this manual:

- **General:** parameterization of the global features of the Dimmer.

- **Functions:** enabling/disabling of specific features of de Dimmer.

3.2. GENERAL WINDOW

This section allows setting global features of LUZEN ONE:

- **Type of load connected**: intended to select the type of load (or of the load combinations) connected to the output of the Dimmer. Available values are "inductive", "inductive-resistive", "resistive", "capacitive-resistive" and "capacitive".

- **Regulation step duration (smooth):** this parameter sets the time the Dimmer takes to progressively switch its output from the OFF (0% of brightness) state to the ON (100% of brightness) state. The value of this parameter must be in the range [2 ... 200] and is later multiplied by 0.5 seconds, so the real transition times allowed are 1 to 100 seconds.

The smooth dimming between brightness levels other than 0% or 100% (OFF-ON) is performed at this same speed. So, the time needed to carry these partial transitions out (for example, from 25% to 0%) will be lower than the one parameretized as "Regulation step duration (smooth)".

✓ *Example:*

Assume a length of 10 seconds has been set for the ON-OFF transition (that is, a value of 20 in the "Regulation step duration (smooth)" parameter). In that case, a smooth dimming from 0% to 50% will take half of that time, that is, 5 seconds.

- **Max. light level:** by default, the value of this parameter will be "Normal (ON total)". However, if "Eco mode" is selected from the displayed list, another parameter ("Never exceed x% energy level") will show up in order to set the maximum level of light that will be allowed for the output channel of the Dimmer. This level is set as a percentage, being [20%...99%] the accepted range for this field. This way, whenever LUZEN ONE receives an order to set a certain level of light, will actually turn the light on to that certain value only if it is lower than the

maximum level parameterized. If not, the actual light level will not increase anymore after reaching that maximum.

✓ *Example:*

If "Never exceed x% energy level" is set to 80%, whenever LUZEN ONE gets an order to turn the lights on to 50%, it will actually set a load level of 50%. However, if the order asks to turn the light on to a level of 90% (or if the order is simply an "ON"), the load will stay at 80%.

Keep in mind that, whatever the value defined for the maximum level to be allowed on the Dimmer output is, LUZEN ONE will always actually send the value "100%" to the KNX bus through the "Light status" communication object. This is to guarantee the consistency in the connection and communication with other KNX devices (such as an **InZennio Z38i** touch panel, which should receive a value of 100% in order to assume that the light has reached the maximum level).

🔹 **Logical functions:** when this parameter is enabled, a new window appears on the left menu, where it will be possible to enable and configure up to 5 multi-operation logical functions. See section 3.4 for further information.

3.3. FUNCTIONS

The LUZEN ONE Dimmer offers a set of functionalities, disabled by default (see figure 3.3). They may be selectively enabled, depending on the needs and requirements of the installation.
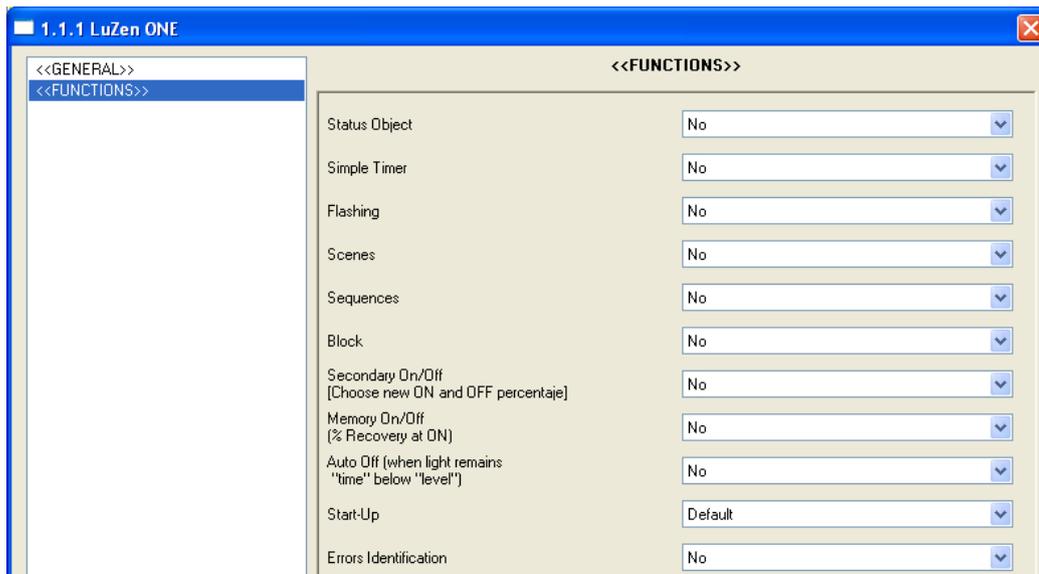
Figure 3.3. Functions section, by default

Every available function is detailed next.

3.3.1. STATUS OBJECTS

This feature allows enabling independently (by selecting "Yes" on the corresponding list or lists) **"1 bit [On/Off]"** objects (in this case, the object "Status On/Off") and "**1 byte [percentage]**" objects (in this case, the object "Light status"), which are responsible for informing other KNX devices about status updates.
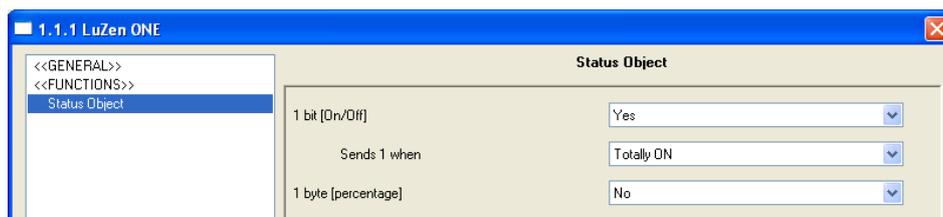
Figure 3.4. Status objects

🔵 **1 bit (On/Off):** enables/disables the 1-bit communication object "ON/OFF status", which is in charge of reflecting on the KNX bus the ON/OFF status of the dimmer channel when required. In the "Sends 1 when" drop-down list displayed if the parameter is set to "Yes", it is possible to set when the "ON/OFF status" communication object should send a "1":

➢ **Totally ON**: the value "1" is sent to the KNX bus only when the light level of the Dimmer channel is lower than 100%.

➢ **Partially ON**: the "1" status will be sent to the KNX bus whenever the light level is between 1% and 100%. In other words, any light level different to 0% will be considered as an ON and a "1" will be sent to the KNX bus through the "ON/OFF status" object.

🔹 **1 byte [percentage]:** enables/disables the 1-byte communication object "Light status", which is in charge of reflecting in real time and whenever it is required the level of light (as a percentage, with a precision of ±1%) connected to the output channel of the Dimmer.

3.3.2. SIMPLE TIMER

This function allows time-driven control of the channel output of the Dimmer, setting delays for the ON and for the OFF status.

In addition to these delays, the length of the ON status can be set by parameter.
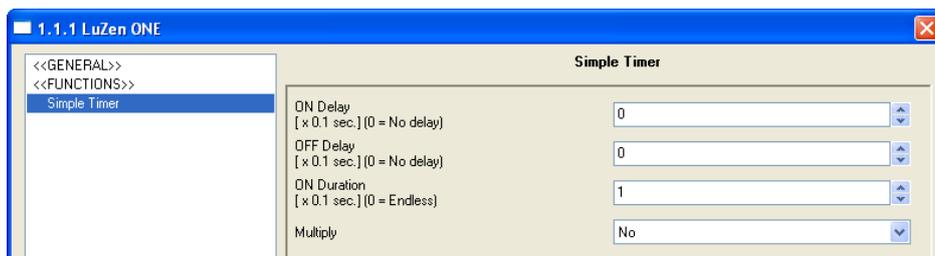

Figure 3.5. Simple timing

The parameters that can be configured for this function are:

🔹 **ON delay:** this parameter sets the required elapsed time between the Timer ON order reception and the switching of the channel output to ON. This value must be set in tenths of a second (e.g., to get 2.5 seconds, set 25). If no delay is needed, a 0 should be set for this field.

🔹 **OFF delay:** this parameter sets the required elapsed time between the Timer OFF order reception and the switching of the channel output to OFF. This parameter works similarly to the "ON delay" parameter.

🔹 **ON duration:** this parameter sets the time the channel output remains ON before switching off again. Setting a 0 in this field means unlimited duration; thus, no temporization is applied to the ON status. The output behaves in this case as if an ON/OFF order had been received. In general, these three parameters apply to the timing functionality in the following way:

➢ When LUZEN ONE gets a "1" through the communication object "Timer", the output channel is ordered to switch on by imposing the ON delay and the ON Duration that have been parameterized (if different to 0).

➢ When LUZEN ONE gets a "0" through the communication object "Timer", the output channel is ordered to switch off by imposing the OFF delay that has been parameterized (if different to 0).

Multiply: it allows progressively increasing (multiplying), in execution time, the ON Duration as well as the ON/OFF delays of the output channel; i.e., when enabling this function, LUZEN ONE multiplies the defined times as many times as the value "1" or "0" is received through the "Simple Timer" object.

➢ **No multiply:** if during a temporized ON, LUZEN ONE receives a "1" through the object "Timer", it re-starts counting the time set in the "ON duration" field.

➢ **Multiply**: the parameterized times that apply to the dimmer output are multiplied by "n" when receiving "n" times the timer order, before the parameterized time expires, through the corresponding object.

3.3.3. FLASHING

This function allows the execution of ON-OFF-ON-OFF sequences, as well as setting the length of the steps in the sequence. In addition, it is possible to set by parameter the number of repeats (up to a maximum of 255) and the final status the dimmer should maintain after the last repeat.

The flashing sequence begins once LUZEN ONE receives a "1" through the "Flashing" object, and ends when it has executed all the parameterized repetitions (unless infinite repeats have been configured, by setting "0" in the corresponding box, as shown later). It is possible to end the execution of the flashing sequence at any time by sending one "0" through this "Flashing" object, or by sending any type of order to the load (such as ON orders, OFF orders, sequence orders...).
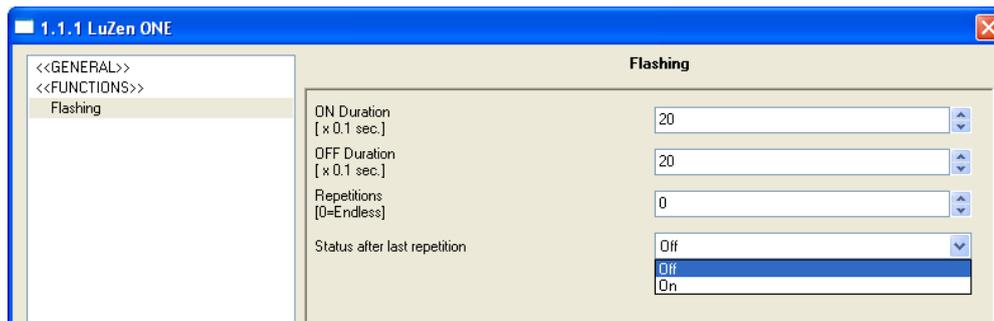
Figure 3.6. Flashing

These are the configurable parameters for the flashing feature:

🔹 **ON duration:** sets the time during which the light will remain ON during an active flashing sequence.

🔹 **OFF duration:** sets the time the light will remain OFF during an active flashing sequence.

🔹 **Repetitions:** defines the number of times the ON/OFF sequence will be repeated while the flashing is active. If "0" is chosen for this field, there will be endless repeats until an order to deactivate the sequence is received.

🔹 **Status after last repetition:** defines the status that the dimmer output should adopt after the last repeat of the sequence. Available options are OFF and N.

Note: *Both functions "Simple timer" and "Flashing" are independent of each other, and do not depend on the normal and secondary ON/OFF controls either; all of them are controlled by four different communication objects.*

✓ *Example:*

If a "1" value arrives through the "Timer" object, one time-driven ON sequence begins on the output channel of the Dimmer. If LUZEN ONE receives one "0" through the "ON/OFF" object before the ON process has been completed, the output will be switched off and the timed sequence will be cancelled.

3.3.4. SCENES

This feature is intended to be used for activating different lighting environments on the output of the Dimmer by means of the 1-byte "Scenes" object,
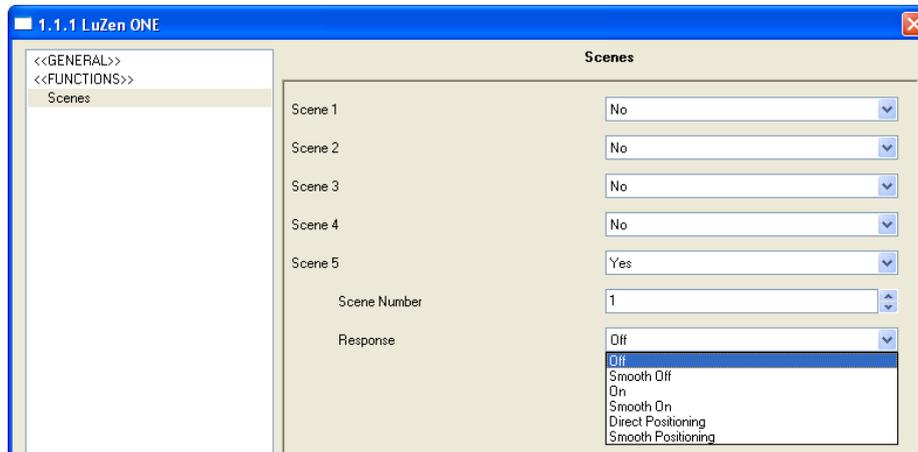

Figure 3.7. Scenes

LUZEN ONE is able to manage up to **five scenes**, each of which will show the following configurable fields:

🔸 **Scene number:** this is the number the Dimmer output will react to.

🔸 **Response:** the type of the reaction to be executed for the above number must be chosen here. Possible values are "OFF", "Smooth OFF", "ON", "Smooth ON", "Direct Positioning" and "Smooth positioning". The first four will cause a switch off, a progressive switch off, a complete switch on or a complete progressive switch on. Regarding "Direct positioning" and "Smooth positioning", if activated, a new parameter will come up. This is to set the light level (as a percentage) which the channel output should switch to when LUZEN ONE receives an order for the corresponding scene via the "Scenes" object.

✓ *Example:*

If two scenes are needed for one domotic deployment, identified as "1" and "2", where scene 1 should cause a complete switch on and scene 2 should progressively change to a light level of 25%, the proper parameterization must be as follows:
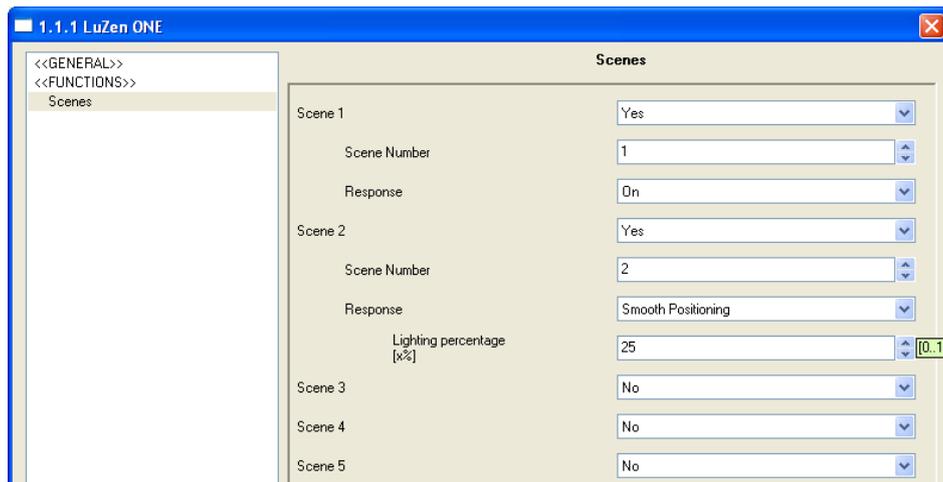
Note: *In case of parameterizing more than one scene with the same identifying number (<u>wrong parameterizing</u>), LUZEN ONE will only execute the first one in being parameterized, and will never execute the reactions associated to the other scenes with the same identifier.*

3.3.5. SEQUENCES

Sequences are made up of up to four consecutive steps, phases of actions, which will be executed by the channel output upon request through the "Sequences" 1-byte object. One can configure the type of response, as well of the length in minutes (up to 255), of each of these steps.
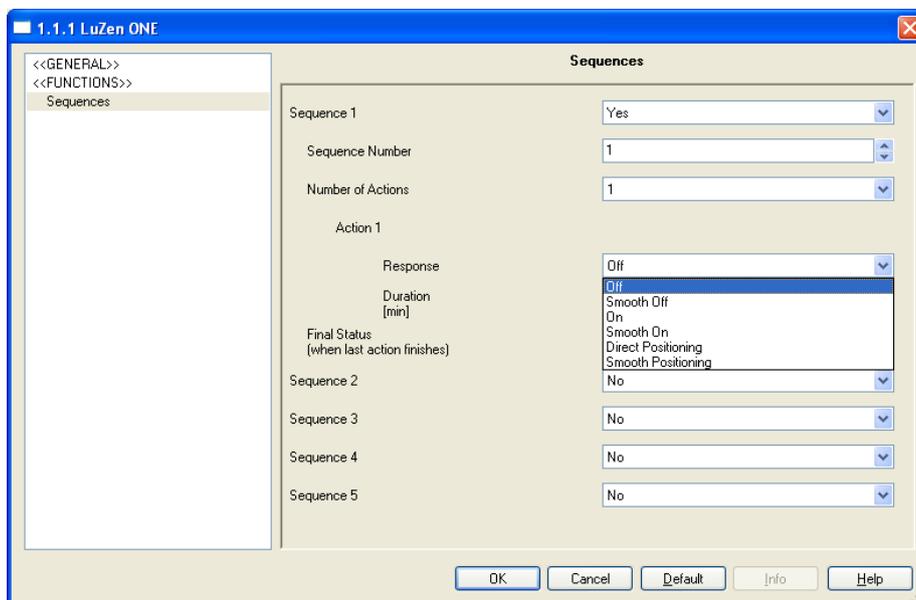

Figure 3.8. Sequences

The maximum number of parameterizable sequences in LUZEN ONE is five, each of which should be configured in terms of:

- 🔵 **Sequence number:** this is the identifying number of the sequence (values 1 to 64) that will trigger the steps of the sequence when received through the "Sequences" object.

- 🔵 **Number de actions:** it determines the number of steps (1 to 4) that will constitute the sequence.

- 🔵 **Final status:** sets the lighting level (as a percentage) the output will switch to after the last of the steps that make up the sequence has been executed.

Every enabled step or action (1 to 4) is associated to three customizable parameters:

- ➢ **Response:** similar to parameter "Response" explained on section 3.3.4 (Scenes). It allows the definition of whether the source of light should react switching completely on, switching completely off, or switching to a certain level (to be entered as the "Lighting percentage" parameter that comes up in case of selecting one of these types or response), with the option, for the three of them, of being done progressively (smoothly).

- ➢ **Duration:** the time that the action will last is set here, in minutes (up to 255).

✓ *Example:*

Suppose the following sequence configuration:

Sequence 1 is enabled, and will be executed after getting a "13" through the communication object "Sequences". Sequence 1 is formed made of 4 steps, each causing a different reaction:

Step 1: the channel output of the Dimmer is switched to a light level equal to 60%, in a smooth transition. This state will remain still for 3 minutes.

Step 2: Sets a lighting level of 0% for the channel output, through an immediate transition. This state will remain still for 5 more minutes.

Step 3: Sets the channel output of the Dimmer to a light level of 100%, at once (no smooth transition). This status will be kept for 2 minutes.

Step 4: Sets the channel output of the Dimmer to a light level of 0%, smoothly. This new status will be kept for 7 minutes. After that time, the output must immediately switch to a light level of 60%, and will remain like that until LUZEN ONE receives any other order.

The following figure shows how the above sequence must be set up in ETS:
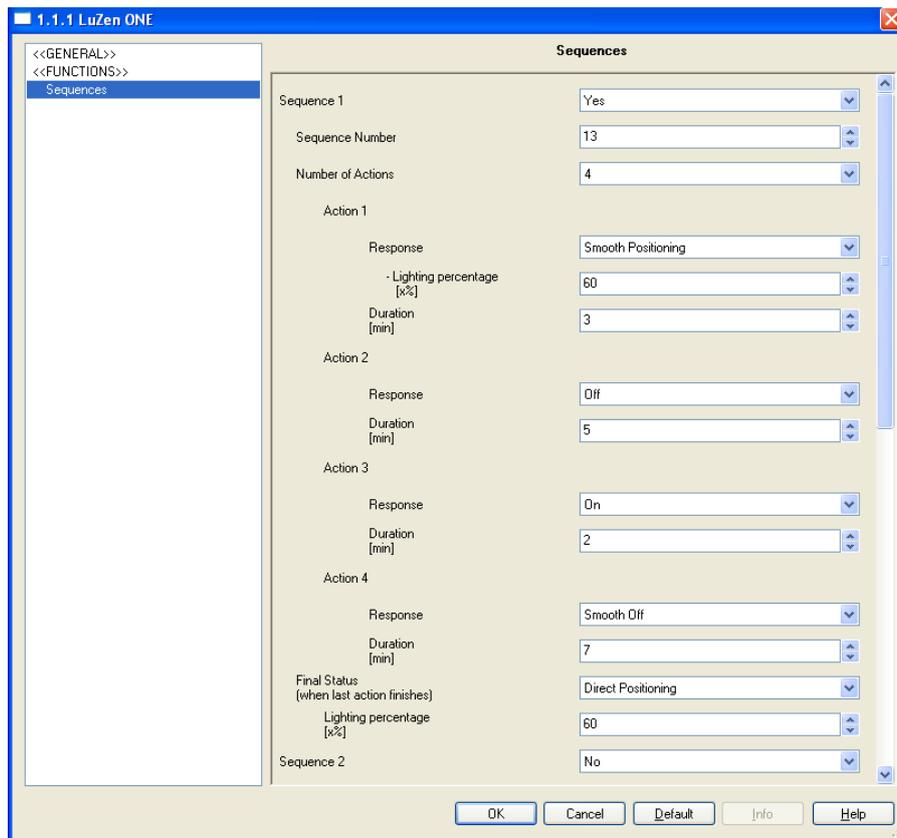
The behaviour of the load connected to the Dimmer channel output will be as follows:
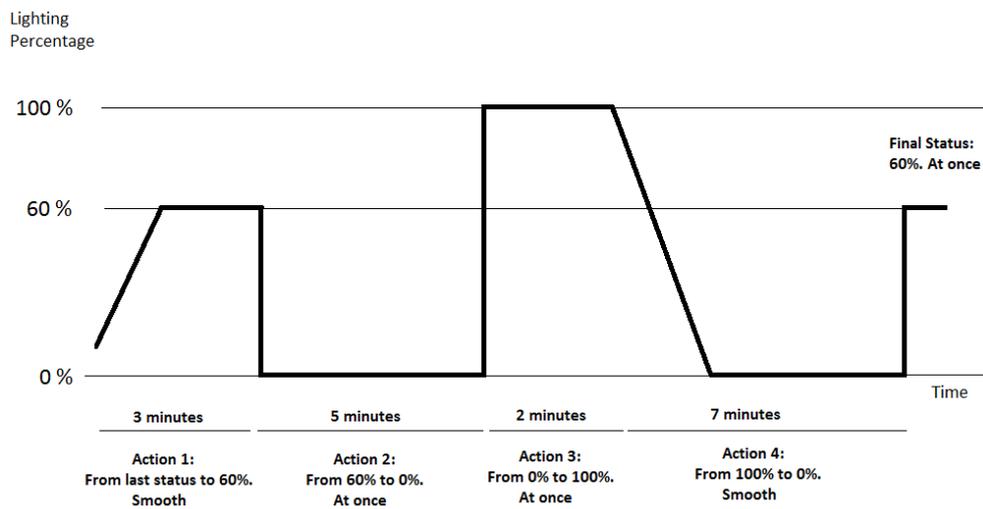
3.3.6. BLOCK

This function makes possible locking the Dimmer channel output; i.e., disabling its control.

LUZEN ONE will block its output when receiving a "1" through the 1-bit communication object "Block". When blocked, every order that reaches the Dimmer will be ignored and the channel output will keep the previous status to the blocking order.

LUZEN ONE will re-enable its output when a "0" is received in "Block". The status will stay the same as before the blocking order. Every order that arrives between the blocking and the unblocking orders will be ignored.

3.3.7. SECONDARY ON/OFF

This feature brings the possibility of enabling a secondary ON/OFF control for the channel output of the Dimmer. The related object is "Secondary ON/OFF", and is intended to switch the light on and off to values other than 100% and 0%, respectively, and to allow smooth transitions.

This can be useful when two different light levels are needed throughout the building, for instance, in kids' rooms or hospitals with patients, where custom ON and OFF light levels may be needed in contrast to the normal ON and OFF brightness needed in the rest of the rooms.
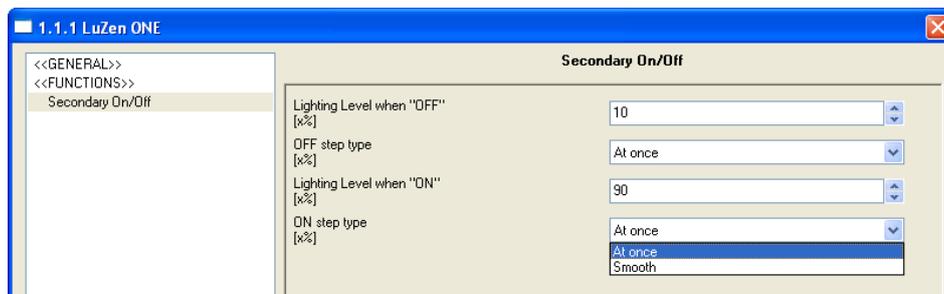

Figure 3.9. Secondary ON/OFF

As it can be seen in figure 3.9, the following parameters can be configured for the secondary ON/OFF control:

- **Lighting level when OFF (%):** sets the brightness level (as a percentage) for the secondary OFF order.

🔵 **OFF step type:** sets whether the OFF transition must be *at once* or *smooth* (the length of the smooth transition will depend on the time defined on the "Regulation step duration (smooth)" box from the "General" tab).

🔵 **Lighting level when ON (%):** sets the brightness level (as a percentage) for the secondary ON order.

🔵 **ON step type:** sets whether the ON transition must be *at once* or *smooth* (once again, the length of the smooth transition will depend on the time defined on the "Regulation step duration (smooth)" box from the "General" tab).

3.3.8. MEMORY ON/OFF

This feature lets the dimmer switching on to the exact level of light that was active before the last OFF order was received –by any of these objects: "ON/OFF (smooth)", "ON/OFF (at once)", "Memory ON/OFF"–.

Enabling this feature in ETS brings the 1-bit "Memory ON/OFF" communication object, as well as the following parameterizable screen:
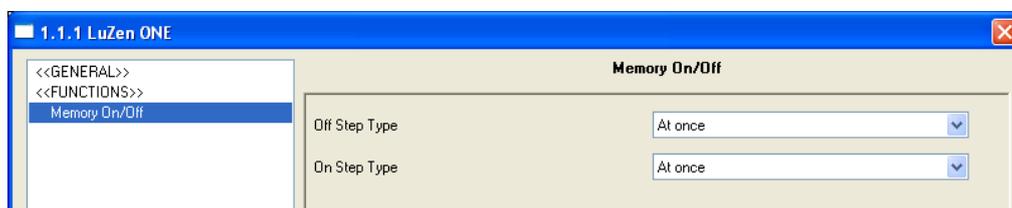
Figure 3.10. Memory ON/OFF

Where the available options are:

🔵 **OFF step type:** sets the way (<u>at once</u> or <u>smooth</u>) the channel output of the Dimmer will switch off when such order (value "0") reaches through the "Memory ON/OFF" object.

🔵 **ON step type:** sets the way (<u>at once</u> or <u>smooth</u>) the channel output of the Dimmer will switch on when such order (value "1") reaches through the "Memory ON/OFF" object.

The "Memory ON/OFF" will only remember the light percentage previous to the switching off if it is different from 0% and the Dimmer is turned off by the communication objects "ON/OFF (smooth)", "ON/OFF (at once)" or "Memory ON/OFF". If the output of the Dimmer turns off because of such order (value "0%") is received through the "Light precise dimming" (at once or smooth), then the

previous light level will not be stored, so when turning the Dimmer back to on through the "Memory ON/OFF" object, the light percentage will be the one of the last order different to 0% sent before the OFF order.

Note: *If an ON command is sent through the "Memory ON/OFF" object and the channel output had already been switched to a level greater than 0%, LUZEN ONE will react turning the output completely on (100%).*

3.3.9. AUTO OFF

Si enabled, the "Auto OFF" feature lets LUZEN ONE automatically turn the light sources off if they are within certain limits.

This self switch-off function considers the time the channel output has been under a certain **threshold brightness level** and, after some time, LUZEN ONE proceeds to turn the output off.

This feature does not bring any related communication objects for controlling purposes (activation/deactivation). It is in fact an internal operation that the Dimmer itself executes, depending on the configured parameters.
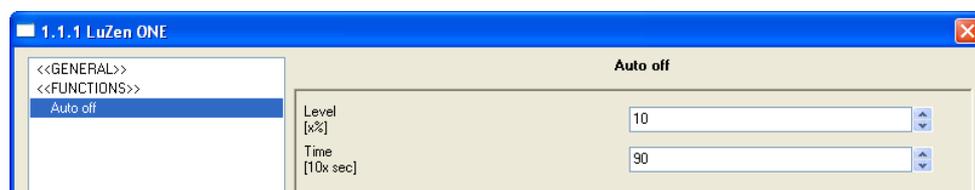
Figure 3.11. Auto OFF

The configurable fields for this feature are:

🔵 **Level (%):** sets the brightness level (percentage between 1% and 50%) the Dimmer will consider before proceeding to execute an Auto OFF action.

🔵 **Time:** sets the time (1..255 minutes) after which, if the light level has been under the above level, the Dimmer will execute the Auto OFF action.

Note: *When LUZEN ONE detects a brightness level lower than the parameterized threshold, it starts counting the time required before the light is turned off. If before this time expires a new brightness level lower than the threshold is set, the counter is reset and a new count begins.*

3.3.10. START-UP

The start-up status of the Dimmer can be configured to be the default one or a custom one.

If "Default" is selected for the start-up, the status of the Dimmer channel output on bus voltage recovery and load voltage recovery will be the last it had before the failure. In addition to this, after a download from ETS the load connected to the channel will start completely off.

If "Custom" is selected, it will be possible to select by parameter the channel output status on bus voltage and on load voltage recovery.
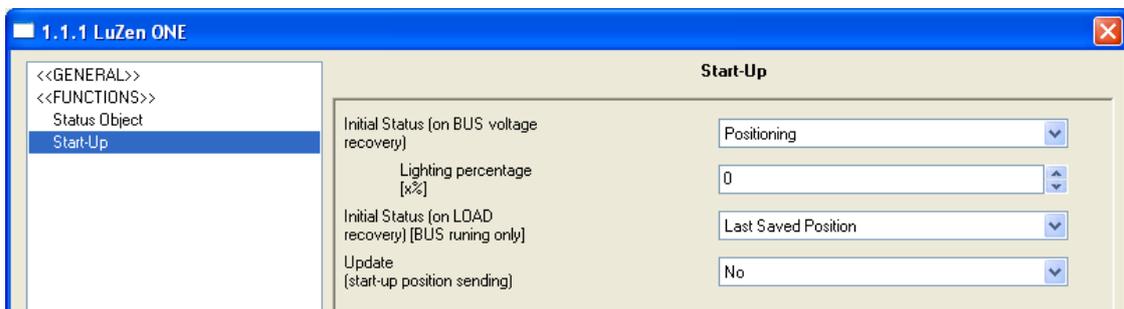

Figure 3.12. Start-up configuration

The following options can be configured:

🔹 **Initial status on bus voltage recovery:** the initial status of the Dimmer channel output when the bus power failure ends or after a download from ETS. It is possible to select one of these statuses: Last saved position (the output remains just as it was before the bus power failure), OFF, ON, and Positioning. When the Positioning option is selected, the box "Lighting percentage" will appear, allowing the selection of specific brightness level (%) for the Dimmer channel output.

🔹 **Initial status on load recovery (bus running only):** the channel output of the Dimmer after LUZEN ONE detects some load connected back after an **open circuit** event. The available options are Last saved position, OFF, ON and Positioning. If the latter is selected, a new parameter will be displayed ("Lighting percentage") which lets setting the brightness level, as a percentage, the Dimmer will switch to.

🔹 **Update (start-up position sending):** if activated ("Yes"), the initial status of the load will be sent to the KNX bus (through the "ON/OFF (Status)" object, which should have appeared if the "Status object" in the "Functions" tab has been previously enabled) upon bus voltage

recovery. This can be useful for other devices which may need to reflect the level of light of the load. When this sending is enabled, a new parameter ("Start-up sending delay") is shown; this sets the time (in seconds) that LUZEN ONE should wait before informing about the status of its output. If an immediate sending is required, a value of "0" should be entered here.

3.3.11. ERRORS IDENTIFICATION

LUZEN ONE integrates an error identification feature which provides short-circuit, open circuit, overload, over-temperature and anomalous frequency protection.

If LUZEN ONE is required to inform the KNX bus about the happening of any of these events, the corresponding parameters will have to be enabled.
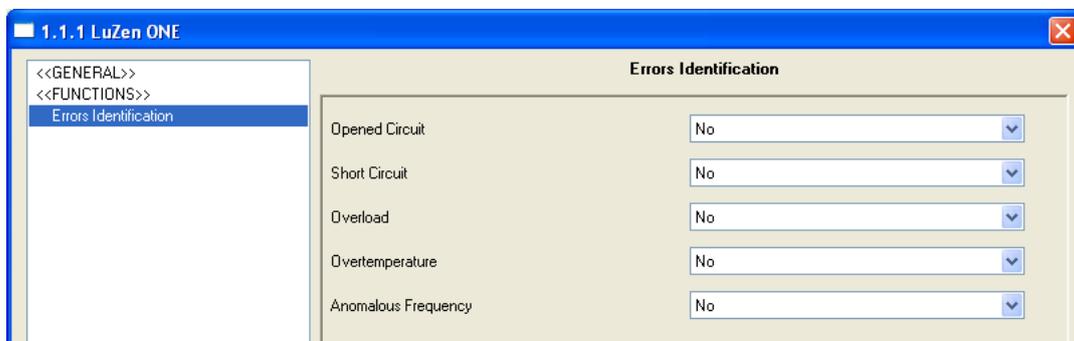
Figure 3.13. Errors identification

How each of these measures work is detailed next:

🔹 **Opened circuit.** When this parameter is enabled, a new 1-bit communication object under the same name is shown. This object will be in charge of notifying the occurrence of the open circuit event by sending a "1", while a "0" sent through the object means that the circuit is connected to a load.

Note: *An **open circuit** is the situation where no load is connected to the channel output of the Dimmer.*

Figure 3.14. Open circuit

LUZEN ONE responds to open circuit events as follows:

➢ When an open circuit event takes place, LUZEN ONE sends a "1" through the communication object "Opened circuit". From that instant, every order received from the KNX bus is ignored until the open circuit situation ends.
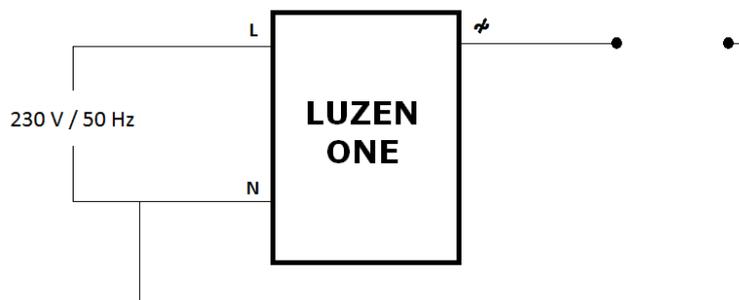
➢ The status objects of the load will change to "OFF" and will send their value to the KNX bus –only if their last statuses were different from the current ones and if status sending had been enabled in ETS–).

➢ LUZEN ONE will periodically check if the open circuit situation has been corrected.

➢ Once the open circuit has been corrected (i.e., a new load connected to the Dimmer is detected), LUZEN ONE will send the value "0" via the "Opened circuit" object and the initial action that had been parameterized for load recovery (see section 2.3.10) will take place. The Dimmer will then stay ready for processing new orders from the KNX bus.

🔴 **Short circuit.** Enabling the "Short circuit" feature will bring a new 1-bit communication object under the same name, which will be in charge of notifying the occurrence of this event by sending a "1", while one "0" means this situation has finished.
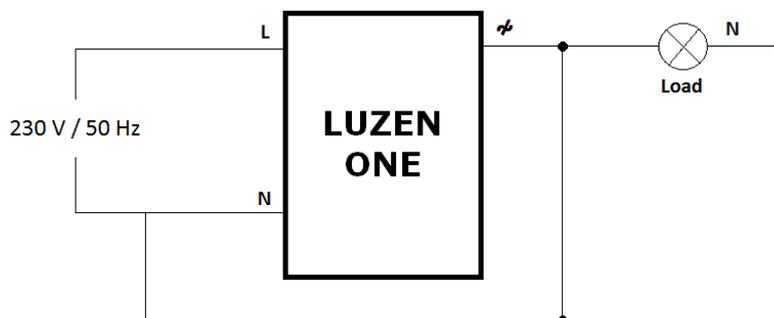

Figure 3.15. Short circuit

LUZEN ONE will react to this short circuit situation on its load as follows:

➢ When the short circuit happens, LUZEN ONE sends the value "1" through "Short circuit". In addition, the status objects related to the load will change their value to "OFF" and will inform the KNX bus about it (only if their previous value was different to the current one and if the sending of statuses had been parameterized in ETS).

➢ The Dimmer itself will periodically check whether the short circuit situation has been corrected, and will send a "0" through the "Short circuit" object in that case.

➢ If LUZEN ONE, while been in the situation of a short circuit, gets an order from the KNX bus (ON, timer, scene, etc.), it will try to regulate the load, considering the following cases:

● If the load is still under a short circuit, LUZEN ONE will not dim the load and will send the value "1" once again through the "Short circuit" object.

● If the load is not under a short circuit anymore, LUZEN ONE will execute the ordered action and will send the value "0" through the "Short circuit" object.

🔴 **Overload.** When the parameter "Overload" is enabled, a new 1-bit communication object is brought under the same name. It will be responsible for notifying the occurrence of this event by sending a "1", while one "0" will mean the end of this situation.

This kind of error takes place when the total load connected to the channel output of the Dimmer is over **400W.**
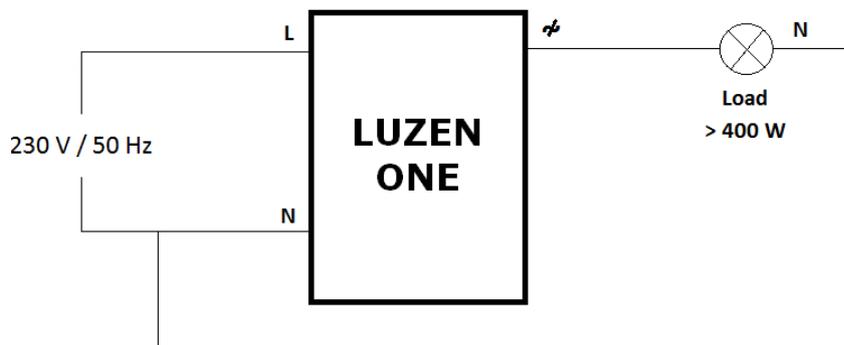

Figure 3.16. Overload

LUZEN ONE reacts to an overload on its channel output as follows:

➢ When the overload takes place, LUZEN ONE will send the value "1" through the "Overload" communication object and will switch off all loads connected to its output.

➢ The Dimmer itself will check periodically whether the overload situation has been corrected, and will send one "0" over the "Overload" object in that case.

➢ If LUZEN ONE, while been in the situation of a overload, gets an order from the KNX bus (ON, timer, scene, etc.), it will try to regulate the load, considering the following cases:

- If the load is still causing an overload, LUZEN ONE will not execute the regulation order and will send another "1" through the "Overload" object.

- If there is no overload anymore, LUZEN ONE will execute the order and will send one "0" through the "Overload" object.

🔵 **Overtemperature.** When this parameter is enabled, a new 1-bit communication object appears under the same name. It will be responsible for notifying the occurrence of this event by sending the value "1", while one "0" will mean that this situation has finished.

LUZEN ONE has got an internal protection system that will drastically reduce the voltage of the load connected to its channel when the internal temperature of the Dimmer is excessive. Of course, internal temperature is assumed to depend on both environmental temperature and the heat produced by the device itself.
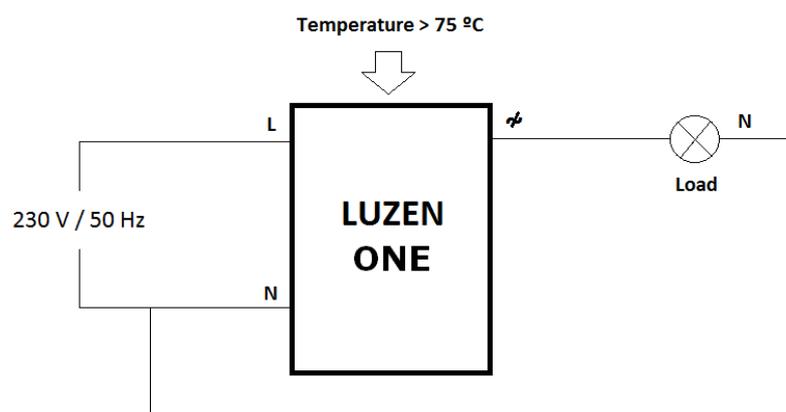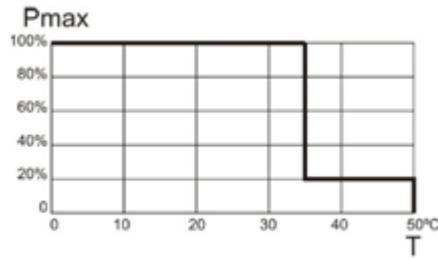

Figure 3.17. Overtemperature

Once an overheating event has taken place, there are two types of response, depending on the internal temperature of the Dimmer:

> ➤ If the internal temperature of LUZEN ONE is found within the range [75ºC … 85ºC]:

LUZEN ONE will send one "1" through the "Overtemperature" communication object and will reduce the light level to 20%. After that, every order received to regulate the light level to a value greater than 20% is ignored (if the level to be set is lower than 20%, the action does take place).

LUZEN ONE will not send a "0" to the "Overtemperature" object until this situation is solved (until the temperature is under 65ºC). From that moment, the light level will not change (typically, will still be 20%) until new a regulation (to increase or to decrease the light level) is ordered.

> ➤ If the internal temperature reaches 85ºC:

The only difference with the above case is that while the temperature is over 85ºC, LUZEN ONE will set the light level of the load at 0%, i.e., no more power will be supplied to the load. Every order will be ignored until the temperature is lower than 65ºC.

Anomalous frequency. When this parameter is enabled, a new 1-bit communication object under the same name shows up. It will be responsible for notifying the occurrence of this event by sending a "1", while one "0" will mean the end of this situation.

This feature allows LUZEN ONE reacting when it detects an **anomalous frequency from the power supply**. The power provided by the supplier company has typically got a constant frequency of 50 Hz. However, this frequency can occasionally result altered. The Dimmer will then be able to detect it and react in a certain way.
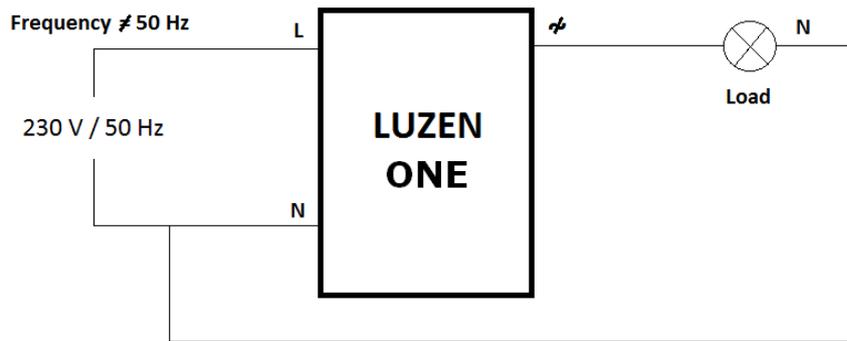
Figure 3.19. Anomalous frequency

The way LUZEN ONE responds once it detects an anomalous frequency on the power supply is as follows:

➢ The frequency is continuously supervised to check whether it has really got the expected frequency of 50 Hz (with an error margin of ± 2Hz) or not.

➢ If LUZEN ONE detects a frequency lower than 48 Hz or greater than 52 Hz, it will activate (switching it to "1") the communication object "Anomalous frequency", and will interpret this situation as an open circuit. That's why the loads connected to the output will turn off (if they were on) and will send a "1" to the "Opened circuit" object.

➢ LUZEN ONE will keep checking the frequency in order to detect if it turns correct again. In such case, the Dimmer will turn off (sending 0s) the error objects "Anomalous frequency" and "Open circuit". In addition, it will switch the load to the status that has been configured as "Initial status on load recovery" (if such parameter has been configured in ETS; if not, the load will adopt the light level it already had before the anomalous frequency error was detected).

3.4. LOGICAL FUNCTIONS

This section in LUZEN ONE is meant to perform binary logic operations with incoming data from the KNX bus, in order to send the result through other communication objects, especially enabled for that purpose.

Up to 5 different logical functions independent of each other can be enabled, and will be able to carry out up to 4 operations each. To use any of them, it is necessary to enable them in the screen shown in figure 3.20, which appears after the option "Yes" has been selected for the "Logical functions" parameter, in the General window of LUZEN ONE.

Figure 3.20. Logical functions
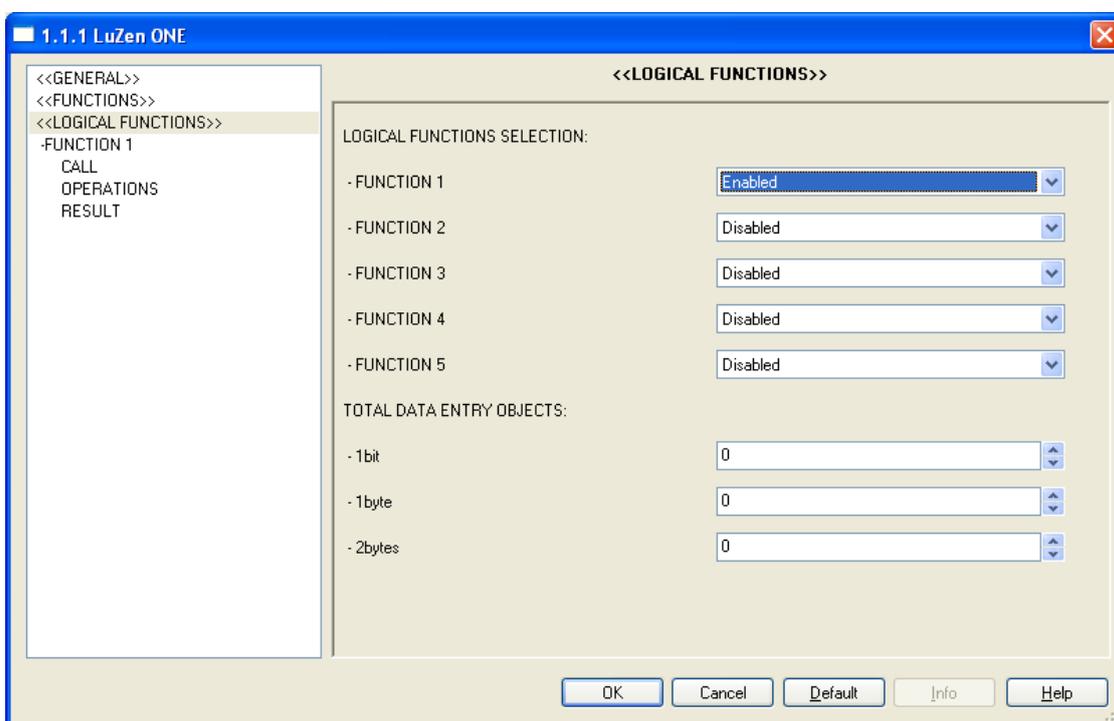
The specific communication objects for logical functions can be 1-bit, 1-byte or 2-byte objects. It is necessary to indicate how many of them are needed to implement the enabled functions.

To obtain detailed information about the use and the ETS parameterization of logical functions, please consult the specific document "Logical functions X5", available at http://www.zennio.com.

ANNEX I. COMMUNICATION OBJECTS

SECTION	NUMBER	SIZE	IN/OUT	FLAGS	VALUES			NAME	DESCRIPTION
					RANGE	1st TIME	RESET		
COMMON	0	1 bit	I	W	0/1	Indifferent	Indifferent	ON/OFF (at once)	0= OFF; 1= ON
	1	1 bit	I	W	0/1	Indifferent	Indifferent	ON/OFF (smooth)	0= OFF; 1= ON
	2	4 bits	I	W	0-15	Indifferent	Indifferent	Light dimming (smooth)	4-bit dimming control
	3	1 byte	I	W	0-100%	Indifferent	Indifferent	Light precise dimming (at once)	1-byte control
	4	1 byte	I	W	0-100%	Indifferent	Indifferent	Light precise dimming (smooth)	1-byte control
STATUS OBJECTS	5	1 bit	O	RT	0/1	0	Previous	ON/OFF Status	0= OFF; 1= ON
	6	1 byte	O	RT	0-100%	0	Previous	Light status	0%: OFF; 1-100%: ON
SIMPLE TIMER	7	1 bit	I	W	0/1	Indifferent	Indifferent	Timer	0= Deactivate; 1= Activate
FLASHING	8	1 bit	I	W	0/1	Indifferent	Indifferent	Flashing	0= Deactivate; 1= Activate
SCENES	9	1 byte	I	W	0-63; 128-192	Indifferent	Indifferent	Scenes	Scene value
SEQUENCES	10	1 byte	I	W	0-63; 128-192	Indifferent	Indifferent	Sequences	Sequence value
BLOCK	11	1 bit	I	W	0/1	0	Previous	Block	0= Unblock; 1= Block
SECONDARY ON/OFF	12	1 bit	I	W	0/1	Indifferent	Indifferent	Secondary ON/OFF	0= Secondary OFF 1= Secondary ON
MEMORY ON/OFF	17	1 bit	I	W	0/1	Indifferent	Indifferent	Memory ON/OFF	0=OFF; 1= ON (memory)

SECTION	NUMBER	SIZE	IN/OUT	FLAGS	VALUES			NAME	DESCRIPTION
					RANGE	1st TIME	RESET		
OPENED CIRCUIT	13	1 bit	O	RT	0/1	0	0	Opened circuit	0=Closed Circuit 1=Open Circuit
SHORT CIRCUIT	14	1 bit	O	RT	0/1	0	0	Short circuit	0= No short circuit; 1= Short circuit
OVERLOAD	15	1 bit	O	RT	0/1	0	0	Overload	0= No overload; 1= Overload
OVERTEMPERATURE	16	1 bit	O	RT	0/1	0	0	Overtemperature	0= No overtemperature; 1= Overtemperature
ANOMALOUS FREQUENCY	18	1 bit	O	RT	0/1	0	0	Anomalous frequency	0= Normal; 1= Erroneous
LOGICAL FUNCTIONS	19-34	1 bit	I	W	0/1	0	Previous	[LF] Data (1 bit) 1 ... [LF] Data (1 bit) 16	Binary data entry (0/1) ... Binary data entry (0/1)
	35-42	1 byte	I	W	0-255	0	Previous	[LF] Data (1 byte) 1 ... [LF] Data (1 byte) 8	1-byte data entry (0-255) ... 1-byte data entry (0-255)
	43-50	2 bytes	I	W	0-FFFF	0	Previous	[LF] Data (2 bytes) 1 ... [LF] Data (2 bytes) 8	2-bytes data entry (0-FFFF) ... 2-bytes data entry (0-FFFF)
	51-55	1 bit	O	RT	0/1	0	Previous	[LF] Function 1 RESULT (1 bit) ... [LF] Function 5 RESULT (1 bit)	1-bit result from function 1 ... 1-bit result from function 5
	56-60	1 byte	O	RT	0-255	0	Previous	[LF] Function 1 RESULT (1 byte) ... [LF] Function 5 RESULT (1 byte)	1-byte result from function 1 ... 1-bit result from function 5
	61-65	2 bytes	O	RT	0-FFFF	0	Previous	[LF] Function 1 RESULT (2 byte) ... [LF] Function 5 RESULT (2 byte)	2-byte unsigned integer result from function 1 ... 2-byte unsigned integer result from function 1
					0-120.0	0	Previous	[LF] Function 1 RESULT (2 byte) ... [LF] Function 5 RESULT (2 byte)	2-byte floating point result from function 1 ... 2-byte floating point result from function 5

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