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Application Manual



**KNX 90-230 Vac 1/4-channel
phase cut dimmers
EK-GD2-TP-1-HV
EK-GD1-TP-4-HV
EK-GD1-TP-4-HV-N**

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Release	Changes	Date	Author	Verified by
1.0	First issue	06/11/2023	G. Schiochet	C. Baldini
2.0	Scenes function update: it automatically switches to DPT 18.001 if the learning option is selected	20/12/2023	G. Schiochet	C. Baldini
3.0	Added model EK-GD1-TP-4-HV-N with common neutral	03/07/2024	G. Schiochet	C. Baldini
4.0	Added AUX output management for EK-GD1-TP-4-HV-N	19/05/2025	G. Schiochet	C. Baldini

1. Scope of the document

This manual describes the application details for version A1.0 of the following ekinex® devices:

- EK-GD2-TP-1-HV: 90-230 Vac 1-channel phase-cut KNX dimmer.
- EK-GD1-TP-4-HV: 90-230 Vac 4-channel phase cut KNX dimmer.
- EK-GD1-TP-4-HV: 90-230 Vac 4-channel phase cut KNX dimmer with common neutral.

The document is intended for the system configurator as a description and reference guide for device functions and application programming. For mechanical and electrical details of the installation device, please refer to the technical data sheet of the device itself.

This application manual and the application programs for the ETS development environment are available for download on the website www.ekinex.com.

Document	File name (## = release)	Versions	Device release	Last update
Datasheet	STEKGD2TP1HV_EN.pdf STEKGD1TP4HV_EN.pdf STEKGD1TP4HVN_EN.pdf	3.0	A1.0	03/07/2024
Application Manual	MAEKGDxTPxHVx_EN.pdf	3.0		
ETS application file	APEKGDxTPxHV##.knxprod	3.0		

2. Product description

The ekinex® KNX phase-cut dimmers powered by 90-230 Vac with 1 or 4 channels EK-GD2-TP-1-HV, EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N allow the brightness control of light loads with voltage 90 - 230 Vac at 50/60 Hz. The 1-channel model has a maximum output power of 230 W, while the 4-channel models have a max. of 230 W for each channel. The loads that can be used with the dimmers can be: incandescent lamps, mains voltage halogen lamps, dimmable mains voltage LED lamps, dimmable mains voltage LED strips, switching power supplies for dimmable phase cut LEDs. The EK-GD2-TP-1-HV and EK-GD1-TP-4-HV cut the phase in Trailing Edge mode (on the falling edge). The EK-GD1-TP-4-HV-N model allows installation using a common neutral scheme and it is possible to select from the ETS application whether the phase-cut must occur in the initial part ("Leading Edge") or final part ("Trailing Edge") of the sinusoid representing the current.

The devices have an integrated bus communication module with SELV 30 Vdc voltage, KNX certified.



Throughout the manual, all the three models will be referenced indifferently; the respective different features will be pointed out wherever required.

The devices are equipped with an integrated interface module towards the KNX bus and are set up for assembly:

- on 35 mm profiled rail (according to EN 60715) using the plastic support supplied, in the case of the 1-channel model;
- on unified DIN guide inside electrical panels, in the case of the 4-channel models.

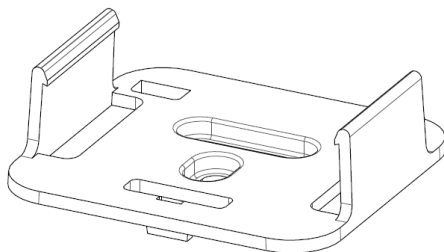


Figure 1 - Support for DIN rail mounting of the 1-channel model

During operation, the module receives communication telegrams from the KNX bus sent by another device (e.g. a manual control point, a sensor, a timer, etc.). These telegrams cause the activation or deactivation of the outputs and the variation of the partitioning percentage, through the application of a series of utility functions defined on the basis of programming.

For the operating logic, the device draws its power supply from the KNX bus line with a SELV voltage of 30V d.c. and therefore does not require additional power sources. All the auxiliary voltages necessary for the operation of the internal logic are produced by the device.



For further details and for the connection diagrams, refer to the STEKGD2TP1HV_EN.pdf, STEKGD1TP4HV.pdf and STEKGD1TP4HVN_EN.pdf technical sheets available on the website www.ekinex.com.

3. Switching, display and connection elements

The 1-channel device is equipped with:

Il dispositivo a 1 canale è dotato di:

- a KNX programming button and LED. This button is also used to carry out a load test, if the KNX bus is connected;
- screw terminal blocks for connecting the power supply for the outputs;
- screw terminal blocks for connection of output loads;
- plug-in terminal block for connecting the KNX bus line.

The 4-channel devices are equipped with:

- a KNX programming button and LED;
- a Manual mode / Test button with signalling LED;
- a button and a LED for each channel, to perform the local ON/OFF test of the output loads; this can also be done in the absence of the KNX bus for the EK-GD1-TP-4-HV model, while the KNX bus must be active for the EK-GD1-TP-4-HV-N model;
- screw terminal blocks for connecting the power supply and the output loads;
- plug-in terminal block for connecting the KNX bus line.

3.1 EK-GD2-TP-1-HV elements

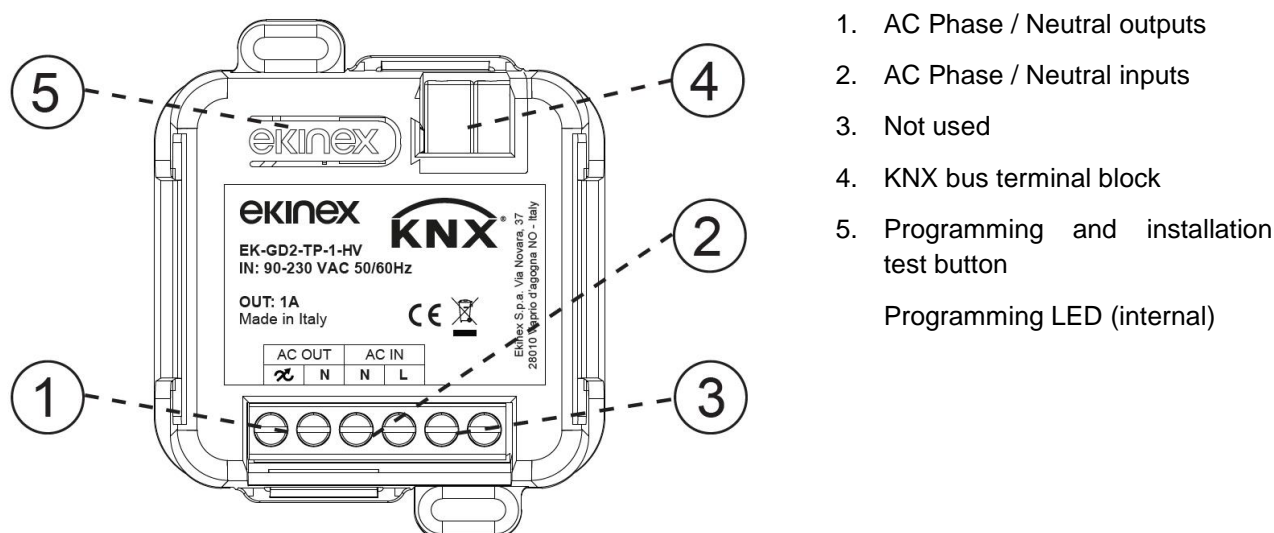
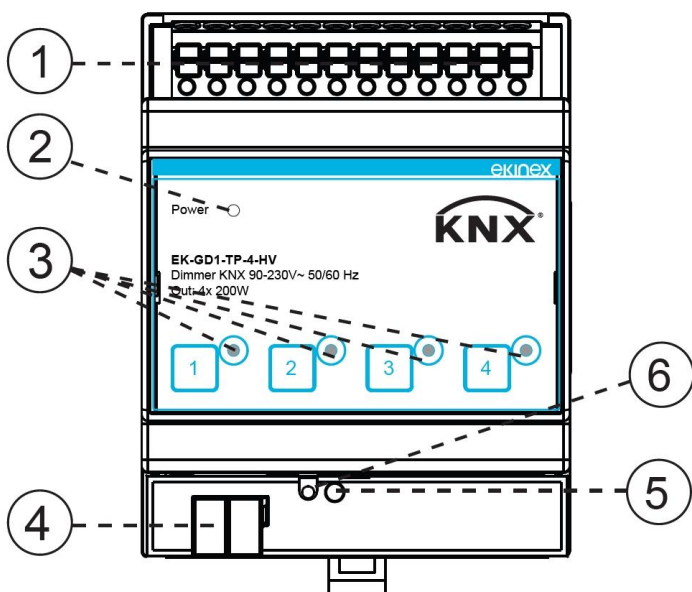


Figure 2 - Switching, display and connection elements for EK-GD2-TP-1-HV

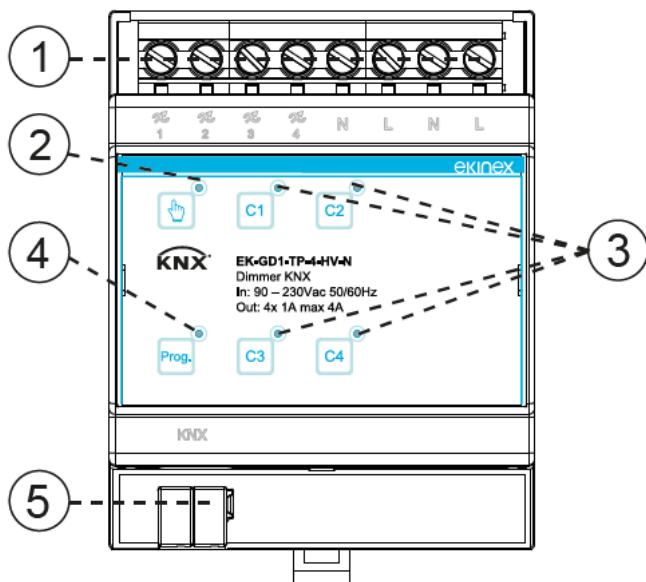
3.2 EK-GD1-TP-4-HV elements



1. Power supply and loads clamps
2. Signalling LED
3. LED and channel x (x = 1,2,3,4) button
4. KNX bus terminal
5. KNX Programming LED
6. KNX Programming button

Figure 3 - Switching, display and connection elements for EK-GD1-TP-4-HV

3.3 EK-GD1-TP-4-HV-N elements



1. 90-230 Vac supply Line / Neutral inputs and channel outputs
2. Manual / test mode button with LED indicator
3. LEDs and membrane buttons for channels 1, 2, 3, 4
4. KNX programming button with LED
5. KNX bus terminal block

Figure 4 - Switching, display and connection elements for EK-GD1-TP-4-HV-N

**Warning:**

Pay particular attention to identifying the correct connections, in order to avoid short circuits and even fatal damage to the operator or to the appliance.

**Warning:**

For the EK-GD1-TP-4-HV-N model, the Leading edge/Trailing edge phase cut mode selection is allowed via ETS.

Please change this parameter with caution. Always check the compatibility of the phase cut mode with the connected load: the device could be damaged if the phase cut selection is not compatible with the lighting fixtures connected to the output.

4. Configuration

The functionality of the devices is determined by the settings made via software. These activities must be carried out in compliance with the building automation system project carried out by a qualified professional.

In order to configure each device, the ETS5 development tool (or later versions) and the dedicated application program **APEKGDxHVxTP##.knxprod** are required; the latter can be downloaded from the ekinex website www.ekinex.com.

The application program is unique for both models and allows you to access, within the ETS environment, the choice of the type of device (1 or 4 channels) and the configuration of all the working parameters of the device. The program must be loaded into ETS (alternatively it is possible to load the entire database of ekinex® products in a single operation), after which all the device examples of the type considered can be added to the project being defined.

The configurable parameters for the device will be described in detail in the following paragraphs.

The configuration can be, and usually will be, done completely off-line; the transfer of the set configuration to the appliance will therefore take place in the programming phase, described in the following paragraph.

Product code	# of channels	ETS Application program (## = version)	Communication objects (max)	Group addresses (max)
EK-GD1-TP-1-HV	1	APEKGDxHVxTP##.knxprod	27	27
EK-GD2-TP-4-HV	4		102	102
EK-GD2-TP-4-HV-N	4		100	100



The configuration and programming of KNX devices require specific knowledge; to acquire this knowledge, it is recommended to attend the appropriate training courses at a center certified by the KNX consortium.

For more information, visit www.knx.org website.

5. Commissioning

After the device configuration has been defined within the ETS project according to the user's requirements, to carry out the programming it is necessary to carry out the following operations:

- electrically connect the device, as described in the technical data sheet or in the instruction sheet, to the KNX bus in the final destination system or in a reduced system, set up specifically for programming. In any case, the system will contain an interface device towards the PC on which the KNX environment is installed;
- apply power to the bus;
- activate the programming mode on the device by pressing the appropriate membrane button located on the front panel. The programming mode indication LED should turn on with a fixed light;
- from the ETS environment, start programming (which in the case of first configuration must include the physical address to be given to the device).

At the end of the program download, the device automatically returns to operating mode; the programming LED must be off. The device is now programmed and ready for operation in the plant.

5.1 Device reset

To reset the device, remove the connection to the bus network by removing the bus terminal from its seat. Keeping the programming button pressed, reinsert the bus terminal in its seat; after about 10 seconds, the programming LED flashes quickly. Release the programming button and extract the clamp again; the reset has been performed. At this point it is necessary to carry out the addressing and configuration of the device again using ETS.



Warning! The reset resets the device to the factory delivery state. The addressing and the value of the parameters set in the configuration phase are lost.

6. Function description

The device is a partialization actuator (dimmer) for alternating current loads at mains voltage, which activates and modulates its outputs according to the commands received via the bus.

It also includes several accessory functions such as:

- ON/OFF control and regulation of light intensity of single or group lighting fixtures
- Fade time on and off, minimum and maximum brightness level, linear or logarithmic regulation curve settable by ETS
- Soft or instant on and off, with settable delay
- Configuration of behavior after power recovery, bus ON/OFF, download via ETS
- Channels settable by ETS as independent, in parallel or with copy function from another channel
- Status indication of the outputs via LED (for 4-channel models only)
- Block function, forced operation, staircase light, scenarios, night, counter and logic functions for each channel, settable by ETS
- Alarm for short circuit, open load and power failure
- Auxiliary output function with status indication via KNX
- Installer mode (only for EK-GD2-TP-1-HV, if KNX bus is present): pressing the programming button for about 2 s activates/deactivates the flashing of the programming LED and the load every 1 s
- For 4-channel models, it is allowed the manual control with membrane buttons and for local ON/OFF testing of channels 1-2-3-4. This function is also available in the absence of the KNX bus for the EK-GD1-TP-4-HV model, while for the EK-GD1-TP-4-HV-N model the KNX bus must be active: if manual mode has been activated, briefly pressing the button switches the load on/off, pressing it for at least 2 seconds makes the load flash approximately every 1 s.

The functional blocks described are illustrated in the following figure, which is particularly important for understanding which functions have priority over the others:

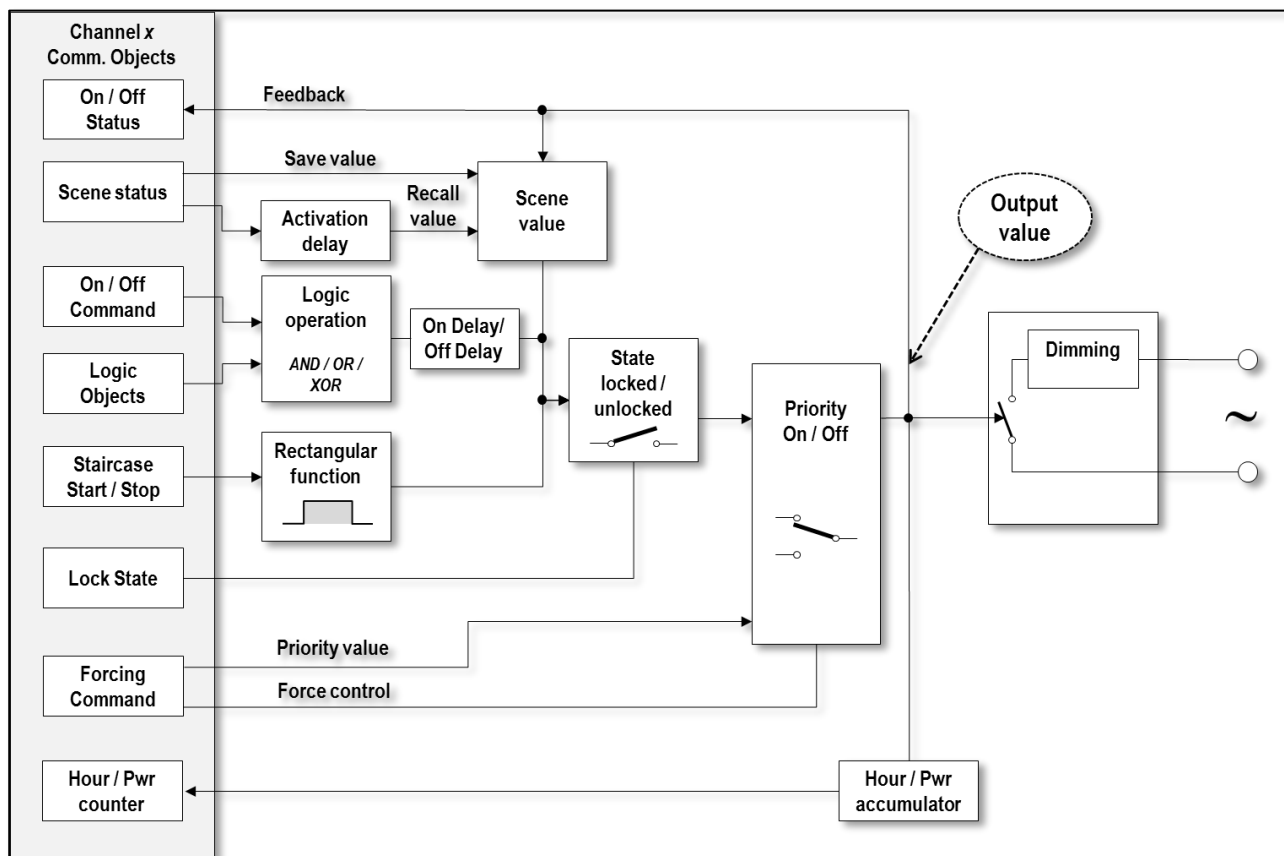


Figure 5 - Functional blocks

The diagram above relates to the on - off switching functions of the outputs; some features, however, also have an influence on the choking value. For example, scenario management also involves defining the intensity value associated with the scenario. Full details are described in the paragraphs regarding the individual functions.

7. Operation at power up

Upon connection of the bus, which also performs the power supply function for the logic, the device enters a state of complete activity after a short period (of the order of tens of ms) necessary for reinitialisation. It is possible to define a larger supplementary delay to avoid a traffic overload on the bus during the system start-up phase.

An unprogrammed device does not perform any activity on the bus; however, the outputs can be individually operated in manual mode (see below) via the membrane keyboard located on the front.

In the event of a voltage drop on the bus (voltage below 19 V for 1 s or more), the device shuts down; before the power becomes insufficient, the state at the time of power off is stored internally.

When voltage is restored, the device resumes operation by restoring the status memorized when it was switched off, except for those parameters for which a different behavior has been configured.

The configuration options allow you to define the state of the device after some significant events. These events are:

- Switch on the device outputs, i.e. applying the mains voltage to supply the outputs;
- Bus off, i.e. lack of KNX bus voltage
- Bus on, i.e. application of the KNX bus voltage
- Downloading a new configuration via ETS

Additional events are associated with specific functions such as output forcing and block function.

For each of these events, the status of the outputs can be selected from various combinations of values according to how the outputs themselves are configured; these combinations of values will be indicated later in the paragraphs dedicated to the description of the corresponding functions.

8. Off-line operation

Since the logic power supply is supplied by the KNX bus, a device not connected to the KNX bus has no operating mode, even if the power supply voltage remains present.

9. Manual operation

The manual operation is an alternative possibility to driving the inputs via bus commands; this mode is intended for test or maintenance situations.

The 4-channel models allow for manual control using the membrane buttons located on the front of the device. Pressing each button allows you to carry out a local ON/OFF test of the load connected to the respective channel. Only for the EK-GD1-TP-4-HV model, this operation is also possible in the absence of the KNX bus.

The 1-channel model also features an "installer mode" for carrying out the load test: pressing the programming button for 2 seconds activates/deactivates the flashing of the programming and load LED every 1 s. In this case, the KNX bus must be connected and active.

10. Online operation

In addition to direct activation, the device is also equipped with auxiliary functions such as timing functions and logic combination of inputs. These functions are described in detail in the following paragraphs.

10.1 Software operation

The activities performed by the software are the following:

- update the internal status variables according to the telegrams on the KNX bus;
- implement timing and other built-in features to determine the state of physical outputs;
- activate the physical outputs according to the state of the logical outputs;
- respond to requests on the bus relating to communication objects.

There are also particular events in correspondence with which additional functions can be activated. These events are, for example, the failure or recovery of the bus or mains voltage and the loading of a new configuration from the ETS (download).

10.2 10.2 Status variables (Communication objects)

The device status, and specifically of its interface elements (outputs) is based on state variables which are automatically defined by the application program. When a status variable is assigned a group address, it becomes to all effects a KNX communication object; as such, it assumes the usual characteristics of communication objects, including for example the possibility of using the flags to establish how the modification of the object impacts its transmission on the bus.

10.3 Output management

In the simplest case, three communication objects are made available for controlling each channel:

- **On-Off command**, turns on or off the load connected to the channel;
- **Dimming command**, modifies the partialization percentage (intensity) incrementally, i.e. with commands of the type increase / decrease / stop;
- **Absolute setpoint control**, allows you to directly specify the partialisation percentage.

10.4 Channel status information

Two communication objects for feedback relating to the status of each channel are available:

- **On/Off status**: there is an object referring to each single output
- **Actual dimming value**: contains the current unloading value the channel is set to.

When these communication objects are defined, they are transmitted automatically at each change of status, so that events can be generated at each effective change of the output. It is also possible to configure the objects so that the transmission also takes place at regular intervals and to set the sending delay after the KNX bus reset.

There is also a communication object called **Auxiliary output status**, which is set to ON if at least one load is active, OFF if no load is controlled. It can be used to drive any ballasts for the lamps



When the on mode and/or the off mode are set to soft, the communication object indicating the current dimming position provides as feedback the actual value it will reach at the end of the ramp. Similarly during dimming, the final value (maximum value or minimum value) is provided as feedback and only after the dimming command is released is the dimming percentage actually reached provided as feedback.

10.5 Dimming function

The main parameters relating to the dimming function are as follows:

- **Curve type:** linear or logarithmic.
- **Minimum / maximum dimming value:** these are the values that define the maximum brightness status of the lamp, those that will be associated with the "On" status (intensity and balance or color), and the limits to be used for dimming operations.

The more precise description of the limits for the various modes can be found in the following paragraph.

- **Full range dimming time:** it refers to the complete transition from 0% to 100%. If variations of lower amplitude are defined (e.g. in sequences), the times will be proportionally shorter.

Different times can be defined for the following transitions, for each channel:

- Absolute dimming (i.e. when the percentage of intensity to be achieved is controlled directly)
- Relative dimming (ie the one obtained with commands such as "raise" / "lower")
- Switching on (upon receiving an "On" command)¹
- Shutdown (upon receiving an "Off" command)

10.5.1 Intensity limits

It is possible to define some parameters to limit the range of intensities, both for technical purposes (e.g. flicker prevention or overdriving) and for functional purposes (e.g. optimization of the usable ranges or of the desired maximum or minimum luminosities).

The **Minimum dimming value** and **Maximum dimming value** parameters allow you to limit the dimming range between a minimum and a maximum value, calculated as a percentage of the maximum available dynamics. After setting these numbers, the regulation values will be normalized with respect to the two new

¹ The "On" dimming time is applied even if the intensity to be reached is not equal to 100%, for example with a restart command when it is set as the "Previous" restart level.

limits, with the new 0% which will correspond to the minimum regulation and the new 100% which will correspond to the maximum regulation.

10.6 Switch On and Off delay

It is possible to set delays between the command to change the state of an output and the actual switching. A separate delay time can be set for each transition in activation and in deactivation (or, with electrotechnical terminology, in energization and in deactivation); these times in the following figure are indicated respectively as T_{ON} and T_{OFF} .

These delays apply to switching via direct command and/or logical objects, but not to switching caused by other functions (e.g. staircase lighting or scene).



Warning! In case of mains power control via auxiliary output, it is recommended to set a minimum time of 500 ms as a power-on delay.

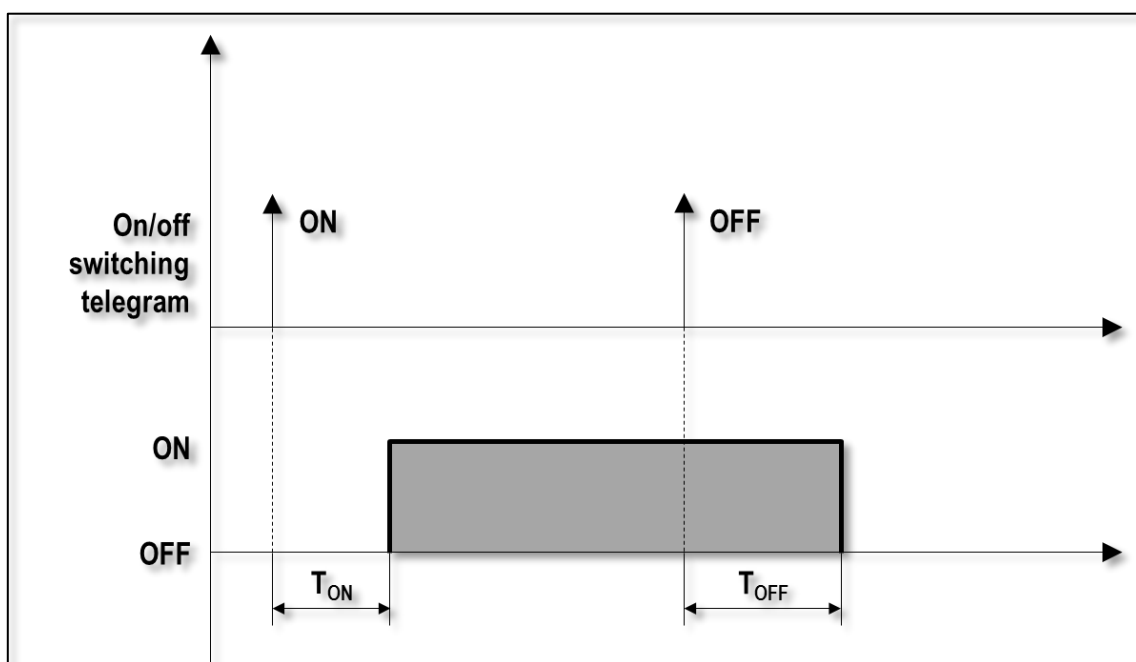


Figure 6 - Switching delays

10.7 Alarm information

Concerning the alarm / fault indicators at the device level, the following communication objects are available:

- **Power alarm status.** It is activated if the power stage supply voltage is missing.
- **Short circuit alarm** (one for each channel), activated if a condition of excessive current absorption is detected on a specific channel.
For the same purpose, 4 further objects related to the individual channels are available.
- **Open load alarm** ((one for each channel), activated if no load is detected on the corresponding channel.

There is a specific parameter to set whether, when one of the alarms is active, it should be cyclically transmitted on the bus and at what interval.

10.8 Staircase light function

The intent of this function is to allow simple and flexible management of the timing of staircase lights or utilities with similar characteristics. The special requirements are as follows:

- the light is activated by a "Start" command (for example via a button or a presence sensor), and normally it must remain on for a programmed base time;
- there must be the possibility of activating a "Stop" command (manual OFF), again via a button or other event, which allows the light to be switched off before the programmed time (e.g. when a sensor detects that the person passing by has left the building);
- there must be the possibility of allowing another "Start" command, received during timing, to restart the time count (Retriggerable);
- a further function, called "pre-warning", can cause the temporary switching off of the light at a certain distance from the end of the time to warn of the imminent deadline; both of these times (duration of the interruption and distance from the end) can be set.



- The prewarning time must be shorter than the staircase lighting time ($T_{P-W} < T_S$) and the interruption time must be shorter than the prewarning time ($T_I < T_{P-W}$).
- The on / off delay times set have no influence on the staircase light function.
- A timing in progress will be terminated by a device reset (bus voltage failure and recovery or reprogramming from ETS) or by the use of any function that influences the output (e.g. direct command, forced command, logic function, scene recall), even if the on / off value of the output is not changed by the used function.
- In the event of forced termination of the timing, the output value remains the one active at the time of termination; this also applies if the termination occurs during the pre-warning time.

The following figures illustrate how the manual off function works:

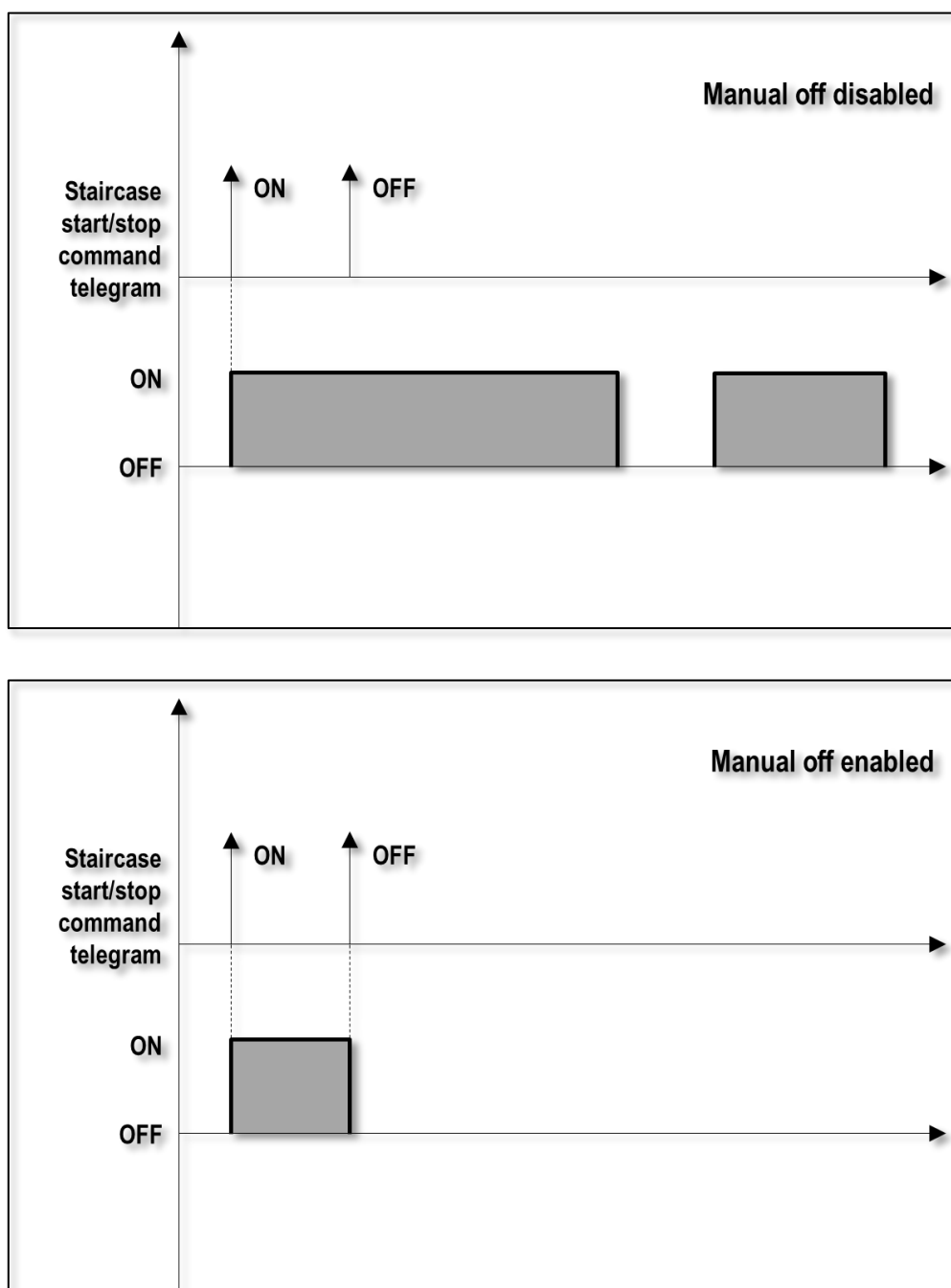


Figure 7 - Manual switch-off function

The following figures illustrate how the Restart (Retriggerable) function works:

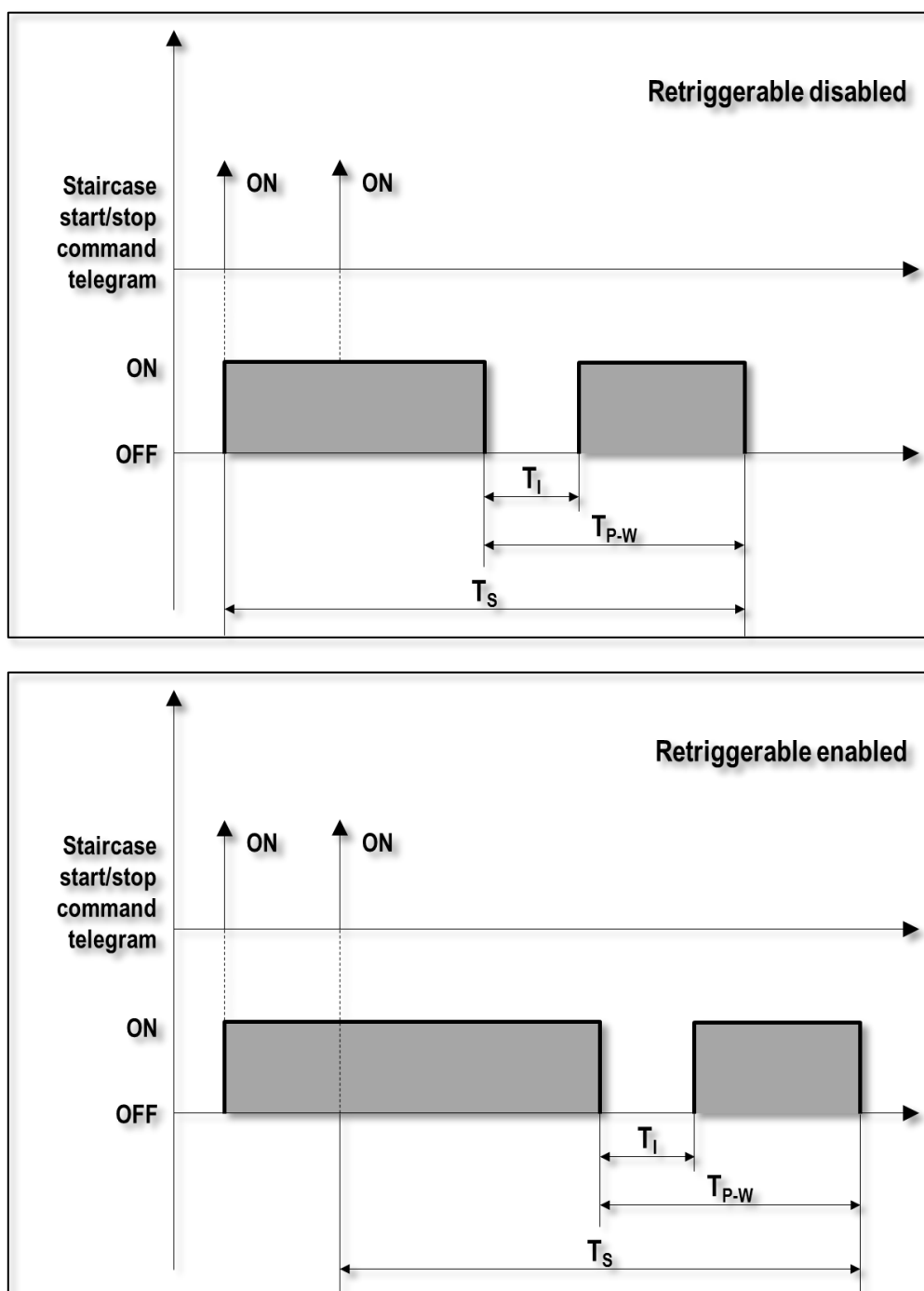


Figure 8 - Retrigger feature

The following figures illustrate how the pre-warning function works:

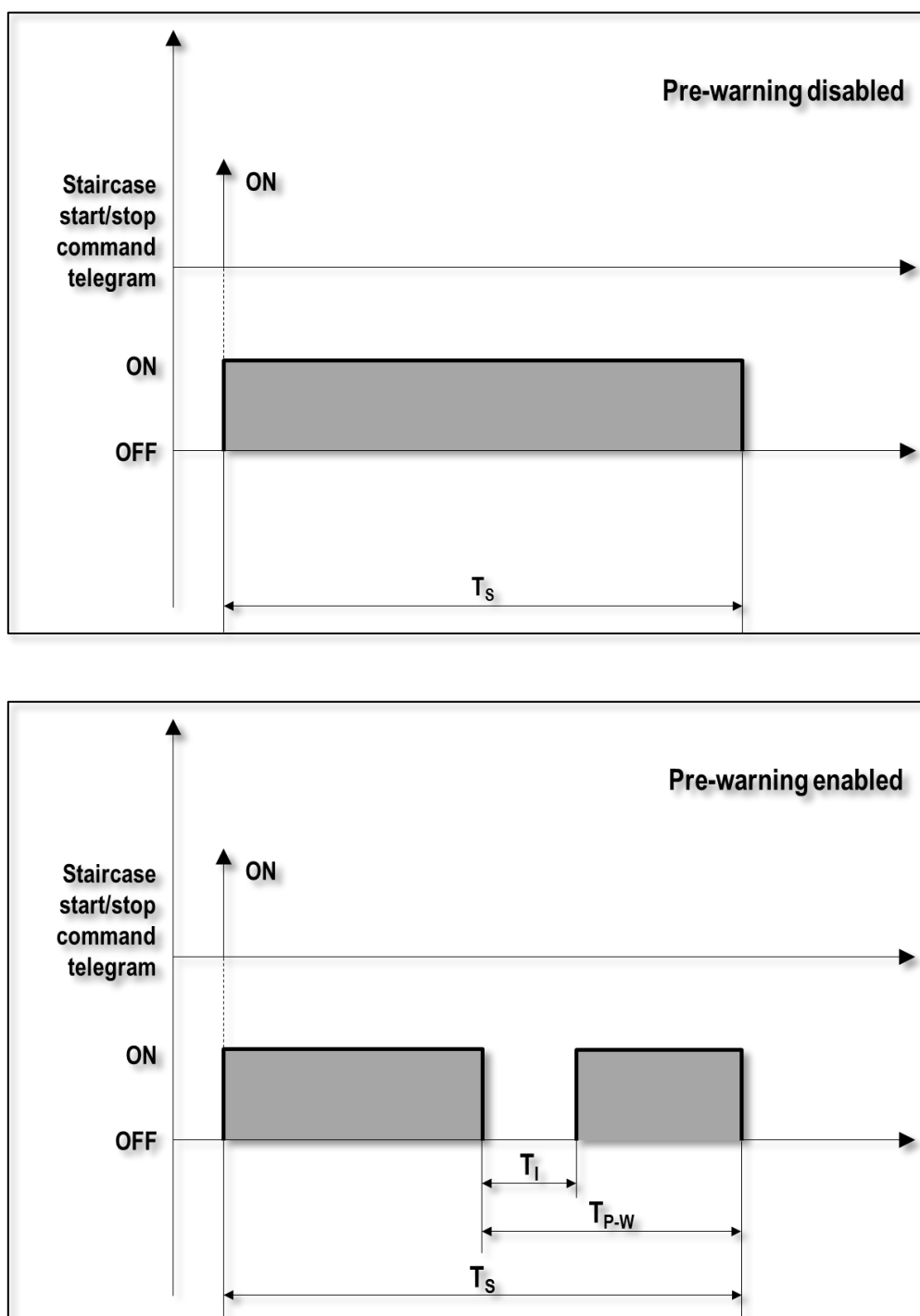


Figure 9 - Pre-warning feature

10.9 Logic function

The device has the possibility of conditioning the status of the outputs with the application of a simple logic block.

The direct command can be applied to the input of a block with a logical operation selectable between AND, OR or *Exclusive OR*. The same block can be supplied as inputs up to 8 further values, belonging to communication objects accessible via bus to other external devices. Each of these objects can be individually applied, if desired, a negation operator that inverts its value.

The inputs formed by the objects are then logically combined as shown in the following figure:

Logic block #1..8

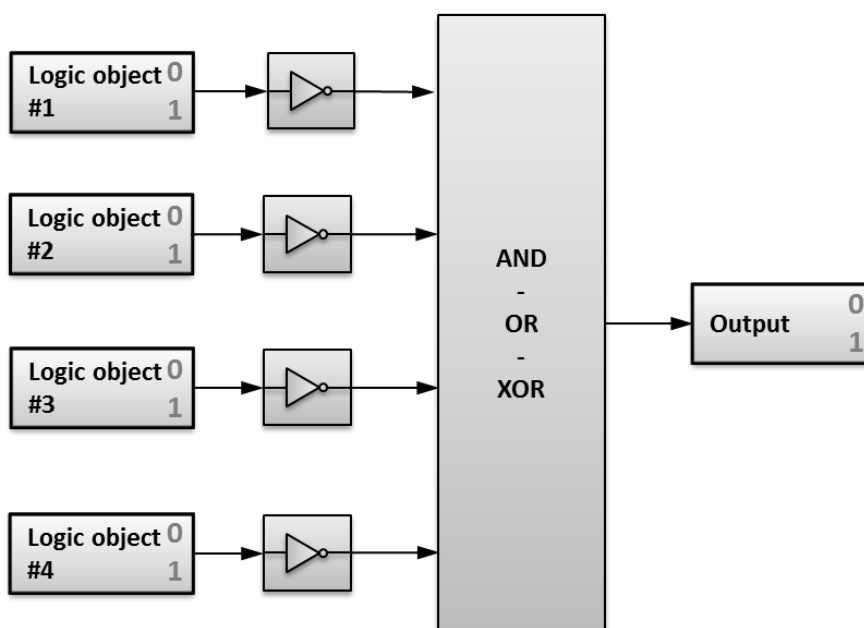


Figure 10 - Logic function

The logic block, on the right in the figure, has the following function depending on the selected operation:

- OR – the output is ON when at least one of the inputs is ON;
- AND – the output is ON only if all inputs are ON;
- XOR – output is ON if an odd number of inputs are ON.

This last function is more intuitive if you refer to only two inputs: in this case, the output is ON when one input or the other are ON, but not together.

It should be noted that, in this description, "input" and "output" refer only to the logic block; for the purposes of device operation, the effective "inputs" are given by the communication objects, therefore the possible activation of the inverters must also be considered.

This structure allows to implement also logical combinations of discrete complexity; moreover, a more stringent programmability would have added excessive complexity and would therefore have been outside the scope of obtaining a simple-to-use structure.

The following figures illustrate the basic logic functions better, assuming that the direct command and a single logic communication object are used as inputs:

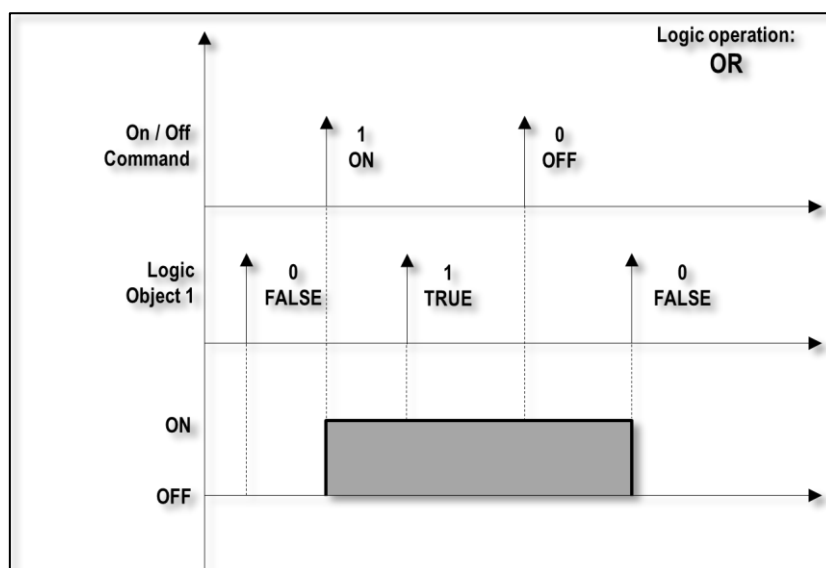


Figure 11 - OR logic function

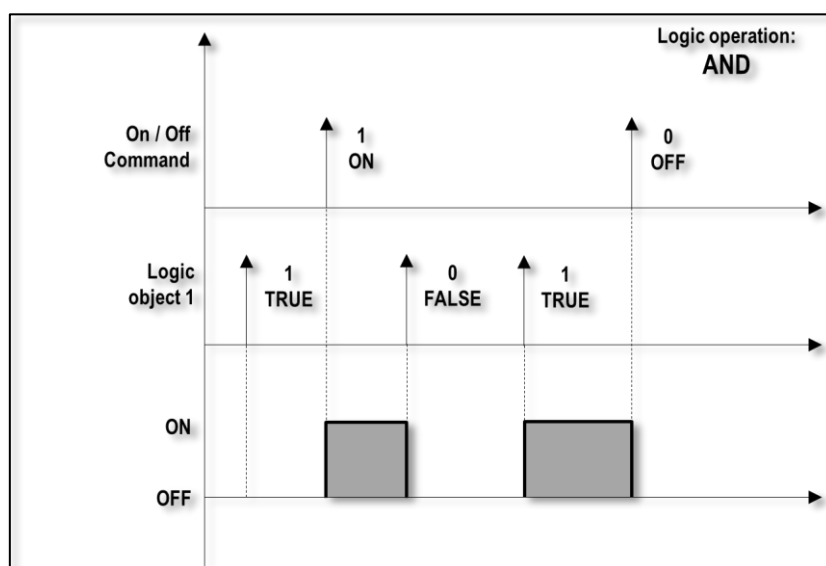


Figure 12 - AND logic function

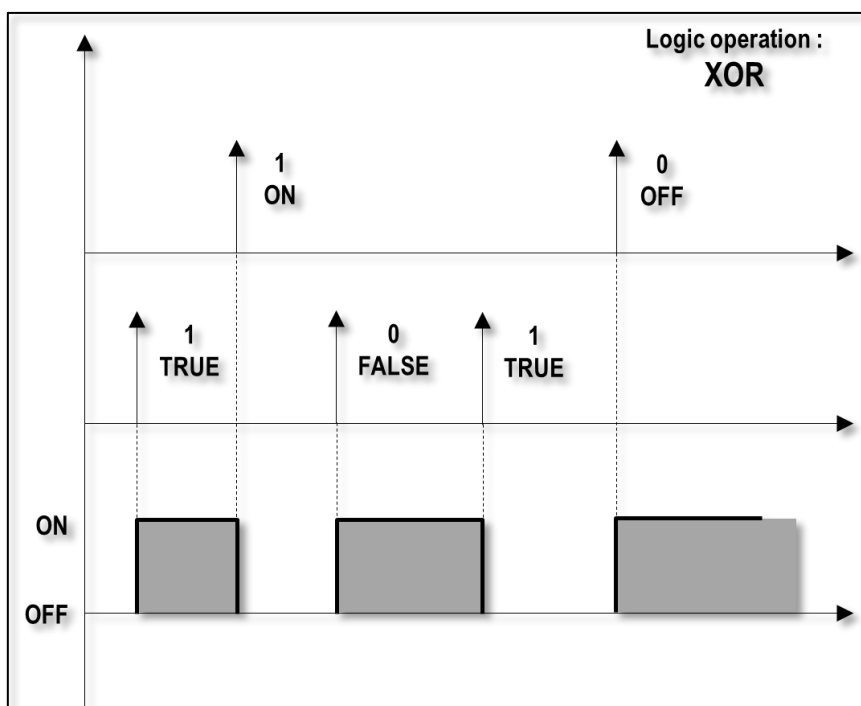


Figure 13 - XOR logic function

10.10 Lock function

If the locking feature is enabled, the operation of a channel can be inhibited by writing a value in a communication object. The value written is of the KNX type “enable”; please beware that the meaning of this value is “*activate lock*”, which is not to be confused either with “*enable locking function*” or with “*enable output*”. The meaning of the value can be optionally inverted through a configuration parameter (an “enable on” value can be interpreted as “lock off”).

A locked output ignores the switching commands that are received for the duration of the lock, thereby maintaining the status it has upon lock entry. The status of the output can be set to a particular value both when the lock is set and when it is released; it is also possible to determine whether the lock status should be maintained or changed on recovery after a bus power-off.

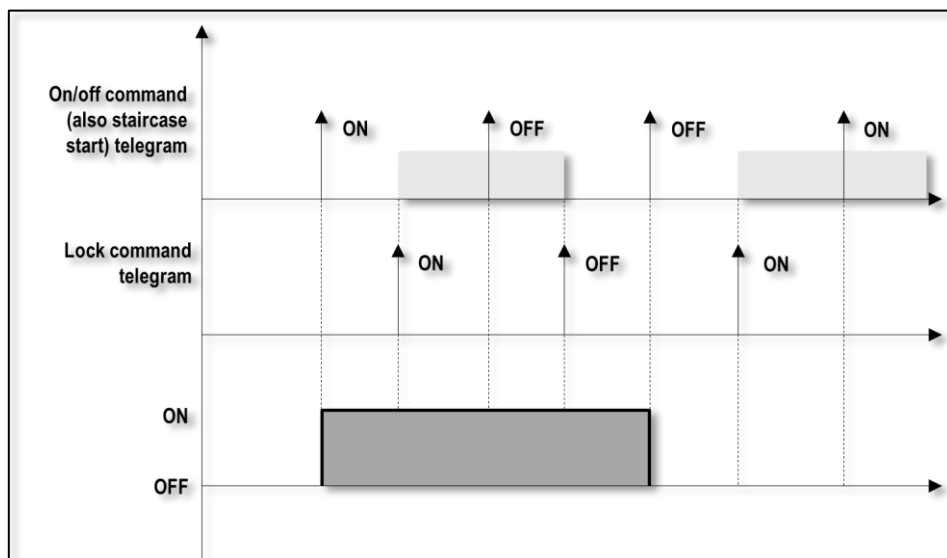


Figure 14 - Lock function

10.11 Forcing function

The forced control is very similar to the basic direct command of the output value, but with the peculiarity that it overrides both the “regular” set value and every other value conditioning feature (i.e. logic function, staircase timing etc.).

It is possible to set what value the output should assume both when the output forcing is released and also on recovery after a bus power-off if forcing was previously in effect.

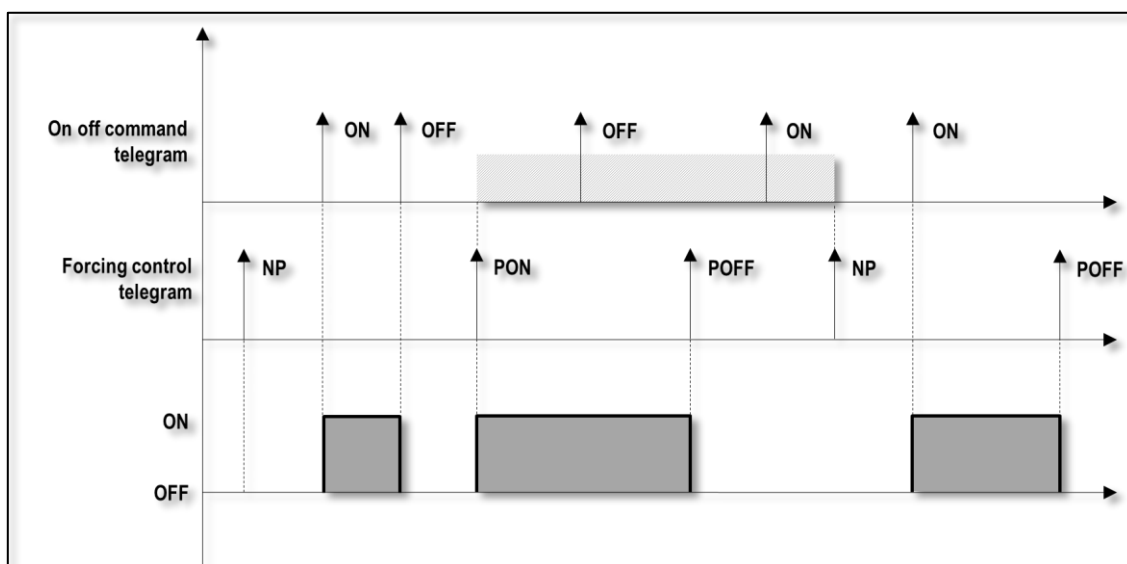


Figure 15 - Forcing function

The “Force” command has priority over Locking (which acts on the ordinary on-off command); therefore, a locked output can still be operated through “Force” commands.

The KNX command code for the “Force” operation is a 2 bit value; the *priority* bit determines whether the output value must be forced, in which case the *value* bit is assigned to the output.

In the figure above, NP means that the *priority* bit is 0 (No Priority), while the PON and POFF codes indicate the values with *priority* = 1 and *value* respectively 1 or 0.

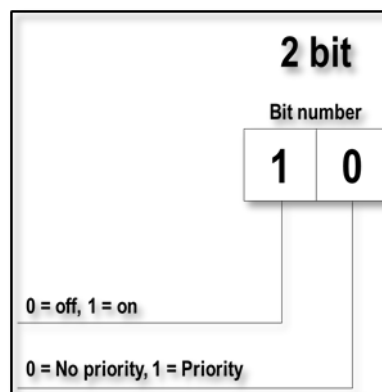


Figure 16 - Force command bits

10.12 Scene management

Each output can be linked to up to 8 scene codes; when one of these scene codes is recalled through a bus command originated by any controller device, the output will assume a preset value (which includes both the On – Off status and the dimming value). An additional delay can be defined for the output activation (or deactivation) from the moment the scene code is recalled.

The output value for a scene can either be fixed and chosen in the configuration phase, or it can be defined as reprogrammable through a Scene Learning command (Learning mode).

If this latter option is enabled (for each channel), whenever a Scene Learning command is received on the bus for a specific scene code to which the output has an association, the device will store the current output status value for that scene. This value will then be recalled in subsequent scene activations.

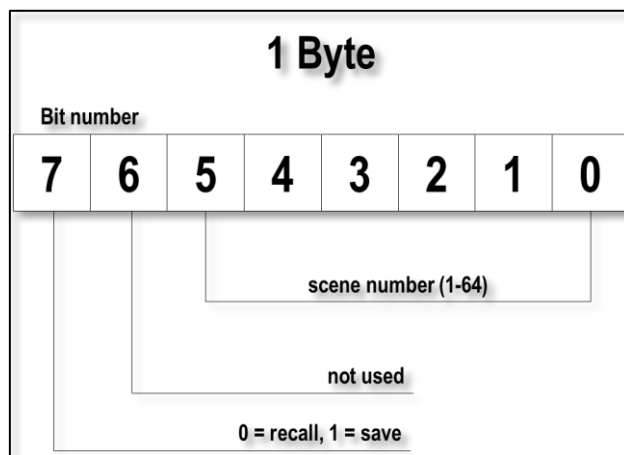


Figure 17 - Scene store / recall command code

10.13 Night function

This function sets a maximum switch-on value on each individual output. This means that, when the function is active and a maximum dimming percentage value has been set on a specific output, any command sent on the bus to increase brightness beyond this value is not considered.

10.14 Operating hours / Energy consumption counter

For each output, an activation counter can be associated, which accumulates the count of hours that the output passed in the “on” state. In terms of communication objects, this counter has the format of a KNX hour counter, thus it also has a “reset” command and a “runout” alarm in case the maximum value is overflowed.

The power counter also has an associated KNX “kWh counter” communication object with its own reset command. An additional parameter allows to define a conventional electrical power value in W which is associated to the load.

Although this is not a “real” power metering, but merely a proportional factor between activation time and the estimated consumed power, nonetheless it can supply a useful indication for approximate power monitoring, particularly for resistive or fixed-power loads like lights or many other home or office appliances.

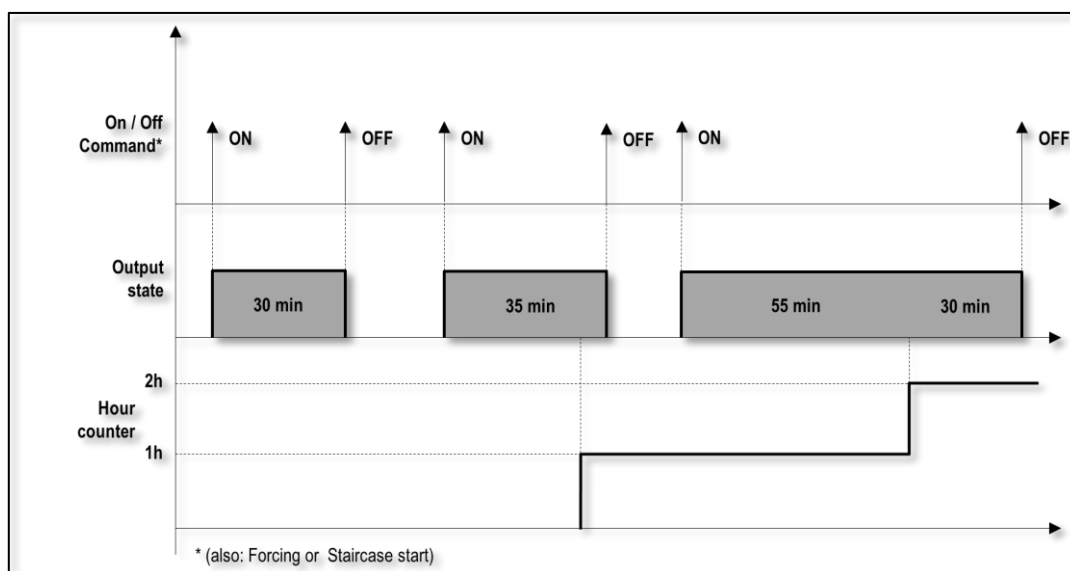


Figure 18 - Operating hours and Energy counter

10.15 Initialisations

It is possible to define the state of the device following various initialization events, such as:

- **Behavior at power ON**, i.e. when the mains voltage is restored;
- **Behavior at bus OFF**, i.e. the reaction to KNX bus failure;
- **Behavior at bus ON**, i.e. when the KNX bus is restored;
- **Behavior after download**, i.e. the status at the end of the ETS application download.

Upon activation of the KNX bus, the **output channels** can be set in one of the following states:

- ON
- OFF
- No change (in case of KNX bus OFF or after download)
- Previous state (in case of KNX bus or power ON)

The difference between "No change" and "Previous status" (option present only for the KNX bus type event ON or *power supply ON*) is that in the first case the output remains unchanged following the event; the second case means when, from the corresponding "Off" event, the outputs could have undergone a modification in manual mode. If this had happened, these modifications would be canceled and the output would return to the previous value.

However, it is important to note that if the modifications were derived from internal operations or commands via bus, their effect would still be maintained.

For each of the available events, if the "ON" option is selected, it is possible to specify the value to be assumed for the channel in question.

11. ETS application program

This section of the manual lists all the parameters that can be configured via ETS and contextually describes the related communication objects.



The parameter values highlighted in bold are the default ones.

The description of the parameters is divided into the following sections:

- **About**: general information on the ETS application
- **General**: general parameters of the device
- **Channel configuration**: general parameters of the outputs
- **Channel x**: general parameters of a specific channel (x = 1 for EK-GD2-TP-1-HV, x = 1,2,3,4 for EK-GD1-TP-4-HV and EK-GD1-TP-4HV-N).

Device parameters are divided into general parameters and specific parameters, grouped into tabs. Figure 19 shows the tree structure of the application program with the main Tabs.

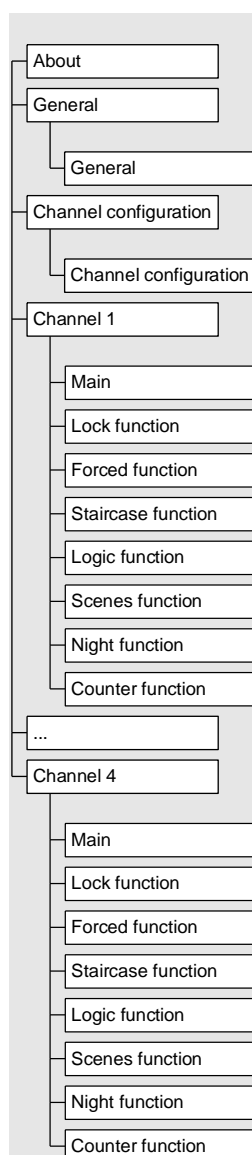


Figure 19 - ETS application parameter structure

11.1 About

The About tab is for information only and does not contain any parameters to set. The information reported is:

© Copyright EKINEX S.p.A. 2024
Application software for ETS5 & ETS6
Version 1.00 (or later)
EK-GD2-TP-1-HV, EK-GD1-TP-4-HV, EK-GD1-TP-4-HV-N – KNX DIMMER series

EKINEX S.p.A.
Via Novara, 37
I-28010 Vaprio d'Agogna (NO) Italy
www.ekinex.com
info@ekinex.com

11.2 General

These parameters are listed in the *General* menu.

Parameter name	Conditions	Settings
Product type	-	EK-GD2-TP-1-HV EK-GD1-TP-4-HV EK-GD1-TP-4-HV-N
	Allows you to choose the type of dimmer, 1 or 4 channels.	
Phase cut mode	Product type = EK-GD1-TP-4-HV-N	Trailing edge Leading edge
	Allows you to select the type of phase cut (leading or trailing edge) for the 4-channel dimmer with common neutral. WARNING: change this parameter with caution. Always check the compatibility of the phase cut mode with the connected load: the device could be damaged if the phase cut selection is not compatible with the lighting fixtures connected to the output.	
Power OFF alarm	-	Disabled Enabled
	Enables or disables the alarm for lack of mains voltage.	
Auxiliary output function		Disabled Enabled
	Enable or disable the auxiliary output.	
Delay power OFF duration	Auxiliary output function = enabled	00:10.000 mm:ss:fff [range 00:00.000 ... 01:00.000]
	Sets the delay for powering off the auxiliary output.	
Delay power ON duration	Auxiliary output function = enabled	00:02.000 mm:ss:fff [range 00:00.000 ... 01:00.000]
	Sets the delay for powering on the auxiliary output	

Object name	Conditions	Size	Flags	DPT	CO number
Power alarm status	Power OFF alarm = enabled	1 bit	CR-T-	[1.005] alarm	1
Auxiliary output status	Auxiliary output function = enabled	1 bit	CR-T-	[1.002] boolean	2

11.3 Channel configuration

These parameters are listed in the *Channel configuration* menu.

These settings allow you to configure which channels are active.

The activation of a channel causes the creation of the basic communication objects already described, which is the minimum configuration necessary for piloting a channel via the bus.

For the EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N devices, two further options are possible for channels 2, 3, 4.

- The configuration can be copied from previous channels, if set as direct: if this option is selected, the channel in question is configured exactly like the model, but with its own copy of the communication objects (whose values can therefore be different). This allows on the one hand to save time in parameterization, and on the other to ensure that there are no discrepancies due to oversights between two channels that you want to be configured in the same way.

It should be noted that copying the configuration from another channel is only a shortcut to facilitate parameterisation; the two channels do not share configuration objects but each maintain their own set of distinct objects. If the configuration of the "model" channel is changed, the same happens for the derived channel; likewise, disabling the "model" channel also disables the derived channel.

- The channel can be placed in parallel with channel 1. In this case, both the configuration and the parameter values are the same: there is only one copy of the communication objects, which are internally associated with both channels.

Parameter name	Conditions	Settings
Output 1	-	Disabled Enabled
<i>Allows you to enable / disable the operation of channel 1.</i>		
Output x	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N	Disabled Enabled
<i>Used to enable / disable the operation of channel x (x = 2, 3, 4). For EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N only.</i>		
Output type	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x (x=2,3,4) = enabled	Direct In parallel with channel 1 Copy parameters from channel
<i>It selects the behavior of the output for the specified channel. For EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N only.</i>		
Channel to copy from	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x (x=2,3,4) = enabled Output type = Copy parameters from channel	Channel 1 if Output 2 Channel 1 / Channel 2 if Output 3 Channel 1 / Channel 2 / Channel 3 if Output 4
<i>It selects the channel from which to copy the parameters for the specified channel. For EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N only.</i>		

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 - ON/OFF command	-	1 bit	C-W--	[1.001] switch	3
<i>This communication object is the direct command for setting the output.</i>					
Output x - ON/OFF command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel	1 bit	C-W--	[1.001] switch	28, 53, 78
<i>See above: x = 2,3,4.</i>					
Output 1 – Dimming command	-	4 bit	C-W--	[3.007] dimming control	4
<i>Control object for incremental type variation (increase / decrease).</i>					
Output x – Dimming command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel	4 bit	C-W--	[3.007] dimming control	29, 54, 79
<i>See above: x = 2,3,4.</i>					
Output 1 – Absolute setpoint control	-	8 bit unsigned value	C-W--	[5.001] percentage (0-100%)	5
<i>Control object for direct setting of the dimming percentage.</i>					
Output x – Absolute setpoint control	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel	8 bit unsigned value	CR-T-	[5.001] percentage (0-100%)	30, 55, 80
<i>See above: x = 2,3,4.</i>					
Output 1 – ON/OFF status	-	1 bit	C-W--	[1.001] switch	6
<i>Object for the on/off status of the channel.</i>					
Output x – ON/OFF status	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel	1 bit	C-W--	[1.001] switch	31, 56, 81
<i>See above: x = 2,3,4.</i>					
Output 1 – Actual dimming value	-	8 bit unsigned value	CR-T-	[5.001] percentage (0-100%)	7
<i>Object for the dimming percentage status of the channel.</i>					
Output x – Actual dimming value	-	8 bit unsigned value	CR-T-	[5.001] percentage (0-100%)	32, 57, 82

Object name	Conditions	Size	Flags	DPT	CO number
	See above: $x = 2, 3, 4$.				
Output 1 – Short circuit alarm	-	1 bit	CR-T-	[1.005] alarm	26
	Object for the short circuit alarm of the channel.				
Output x – Short circuit alarm	-	1 bit	CR-T-	[1.005] alarm	51, 76, 101
	See above: $x = 2, 3, 4$.				
Output 1 – Open load alarm	-	1 bit	CR-T-	[1.005] alarm	27
	Object for the open load alarm of the channel.				
Output x – Open load alarm	-	1 bit	CR-T-	[1.005] alarm	52, 77, 102
	See above: $x = 2, 3, 4$.				

11.4 Channel x

These parameters are found under the *Channel x - Main* tab, where $x = 1$ for EK-GD2-TP-1-HV and $x = 1, 2, 3, 4$ for EK-GD1-TP-4-HV.

The *Channel x – Main* tab is visible only if *Output x = Direct* or *In parallel with channel 1* has been selected in the *Channel configuration* tab.

Parameter name	Conditions	Settings
Curve type	Output 1 = enable, or Output x ($x=2,3,4$) = enabled Output type = Direct, or In parallel with channel 1	Linear Logarithmic
	Used to set the dimming curve, i.e. the parameter that specifies the response of the dimmer voltage output to the input of the control signal.	
Minimum dimming value (%)	As above	0 ... 100
	It sets the minimum brightness value in percentage.	
Maximum dimming value (%)	As above	0 ... 100
	It sets the maximum brightness value in percentage.	
Full range dimming time	As above	00:04.000 mm:ss:fff [range 00:00.000 ... 01:00.000]
	It sets the time required to complete a dimming from 0% to 100% or vice versa.	
Intensity when switch ON	As above	Last value New value
	Allows you to choose whether to keep the last dimming value set or choose a new one.	
Light intensity (%)	As above Intensity when switch ON = new value	50 [0 ... 100]

Parameter name	Conditions	Settings
	<i>Allows you to choose the new dimming value.</i>	
Switch ON type	Output 1 = enabled, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	Instant ON Soft
	<i>Allows you to choose the type of switch ON, instant or soft.</i>	
Ramp time for ON	As above Switch ON type = Soft	00:02.000 mm:ss:fff [range 00:00.500 ... 01:00.000]
	<i>It sets the time required to complete a soft switch ON.</i>	
Delay start dimming after switch ON (ms)	Output 1 = enabled, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	250 [range 0 ... 1000] ms
	<i>Sets an optional delay time for the start of dimming after the channel is switched on.</i>	
Switch OFF type	Output 1 = enable, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	Instant OFF Soft
	<i>Allows you to choose the type of switch OFF, instant or soft.</i>	
Ramp time for OFF	As above Switch OFF type = Soft	00:02.000 mm:ss:fff [range 00:00.500 ... 01:00.000]
	<i>It sets the time required to complete a soft switch OFF.</i>	
Switch ON when dimming up	Output 1 = enable, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	Always Only when dimming Only on percentual command Never
	<i>Allows you to set the switch ON mode while dimming.</i>	
Switch OFF when dimming down	As above	Always Only when dimming Only on percentual command Never
	<i>Allows you to set the switch OFF mode while dimming.</i>	
ON delay time	As above	00:00.000 mm:ss:fff [range 00:00.000 ... 99:59.999]
	<i>Delay before a switch ON.</i>	
OFF delay time	As above	00:00.000 mm:ss:fff [range 00:00.000 ... 99:59.999]
	<i>Delay before a switch OFF.</i>	
Status feedback telegram	As above	Enabled Disabled
	<i>Enables sending of status objects on the bus.</i>	

Parameter name	Conditions	Settings
Delay after bus recovery	As above Status feedback telegram = enabled	00:01.000 mm:ss:fff [range 00:00.000 ... 99:59.999]
<i>It sets the delay after which to send the status feedback when the bus is restored.</i>		
Transmission cycle time	As above Status feedback telegram = enabled	00:00:00 hh:mm:ss [range 00:00:00 ... 04:39:37]
<i>Status feedback sending period.</i>		
Behaviour at power ON	Output 1 = enable, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	Previous state Off On
<i>It sets the behavior of the dimmer on power recovery.</i>		
Light intensity (%)	As above Behaviour at power ON = ON	50 [0 ... 100]
<i>Allows you to choose the new dimming value when power is restored.</i>		
Behaviour at bus OFF	Output 1 = enable, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	No change Off On
<i>It sets the behavior of the dimmer when the KNX bus goes OFF</i>		
Light intensity (%)	As above Behaviour at bus OFF = ON	50 [0 ... 100]
<i>Allows you to choose the new dimming value when the KNX bus goes OFF.</i>		
Behaviour at bus ON	Output 1 = enable, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	Previous state Off On
<i>It sets the behavior of the dimmer when the KNX bus is restored.</i>		
Light intensity (%)	As above Behaviour at bus ON = ON	50 [0 ... 100]
<i>Allows choosing the new dimming value when the KNX bus is restored.</i>		
Behaviour after download	Output 1 = enable, or Output x (x=2,3,4) = enabled Output type = Direct, or In parallel with channel 1	No change Off On
<i>It sets the behavior of the dimmer after downloading the ETS application.</i>		
Light intensity (%)	As above Behaviour after download = ON	50 [0 ... 100]
<i>Allows you to choose the new dimming value after downloading the ETS application.</i>		

11.4.1 Lock function

These parameters are found under the *Channel x - Main* tab, where x = 1 for EK-GD2-TP-1-HV and x = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

The lock function allows you to inhibit the operation of the output of a specific channel.

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel x – Lock function	-	Disabled Enabled
<i>Enables or disables the lock function, i.e. the possibility of inhibiting the modification of the output via a command from the bus.</i>		
Channel x – Lock function – Lock device signal	Lock function = enabled	Not inverted inverted
<i>Used to invert the lock function signal.</i>		
Channel x – Lock function – After bus recovery	Lock function = enabled	Previous state Lock Unlock
<i>Used to set the status of the lock when the bus is restored.</i>		
Channel x – Lock function – Behaviour at locking	Lock function = enabled	No change Off On
<i>Used to set the output status when the lock is enabled.</i>		
Channel x – Lock function – Behaviour at locking - Light intensity (%)	Lock function = enabled Behaviour at locking = ON	50 [0 ... 100]
<i>Used to set the dimming value when the block is enabled</i>		
Channel x – Lock function – Behaviour at unlocking	Lock function = enabled	No change Off On Updated value Value before locking
<i>Used to set the output status when the lock is disabled.</i>		
Channel x – Lock function – Behaviour at unlocking - Light intensity (%)	Lock function = enabled Behaviour at unlocking = ON	50 [0 ... 100]
<i>Used to set the dimming value when the block is disabled.</i>		

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Lock command	Output 1 = enabled Lock function = enabled	1 bit	C-W--	[1.003] enable	9
<i>If in "Enable" status, it inhibits direct commands for the output (both on/off and intensity modification); in the "Disable" state it allows normal operation.</i>					

Object name	Conditions	Size	Flags	DPT	CO number
Output x – Lock command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Channel x lock function = enabled	1 bit	C-W--	[1.003] enable	34, 59, 84
See above: x=2,3,4					

11.4.2 Forced function

These parameters are available under the *Channel x - Main* tab, where x = 1 for EK-GD2-TP-1-HV and x = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

The forced function allows you to force a value on the output of a specific channel, with precedence over the other functions.

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel x – Forced function	-	Disabled Enabled
<i>Enables or disables the forcing function, i.e. the possibility of forcing a value on the output with precedence over the other functions.</i>		
Channel x – Forced function – Behaviour on forced control start	Forced function = enabled	Last value Predefined value
<i>Defines the state that the output must assume when forcing is activated.</i>		
Channel x – Forced function – Behaviour on forced control start - Light intensity (%)	Forced function = enabled Behaviour on forced control start = predefined value	50 [0 ... 100]
<i>Allows you to set the dimming value when forcing is activated</i>		
Channel x – Forced function – Behaviour on forced control end	Forced function = enabled	No change Off On Previous state
<i>Defines the state that the output must assume when forcing is released.</i>		
Channel x – Forced function – Behaviour on forced control end - Light intensity (%)	Forced function = enabled Behaviour on forced control end = ON	50 [0 ... 100]
<i>Allows you to set the dimming value when forcing is released.</i>		

Parameter name	Conditions	Settings
Channel x – Forced function – Behaviour after bus recovery	Forced function = enabled	No change Off On
	<i>Defines the state that the outputs must assume and the forcing state after bus voltage is restored. Therefore:</i> <ul style="list-style-type: none"> <i>No change: upon bus restoration, the channel and forcing states remain unchanged;</i> <i>Off: upon bus restoration, the channels must go OFF without forcing;</i> <i>On: upon bus restoration, the channels must go ON with forcing.</i> 	
Channel x – Forced function – Behaviour after bus recovery – Light intensity (%)	Forced function = enabled Behaviour after bus recovery = ON	50 [0 ... 100]
	<i>Used to set the dimming value when the KNX bus is restored.</i>	

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Forcing command	Output 1 = enabled Forced function = enabled	2 bit	C-W--	[2.001] 1-bit controlled Switch control	10
	<i>Used to force the status of an output.</i> <i>The value consists of 2 bits: the first indicates the priority status (i.e. indicates that forcing is active if "Priority" = On) and the second indicates the value to be forced (which is ignored if forcing is not active).</i> <div><div>2 bit</div><div><div>Bit number</div><div>10</div></div><div>0 = off, 1 = on</div><div>0 = No priority, 1 = Priority</div></div>				
Output x – Forcing command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Channel x forced function = enabled	2 bit	C-W--	[2.001] 1-bit controlled Switch control	35, 60, 85
	<i>See above: x=2,3,4</i>				

11.4.3 Staircase light function

These parameters are found under the *Channel x - Main* tab, where x = 1 for EK-GD2-TP-1-HV and x = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

For an exhaustive discussion of the staircase light function, refer to paragraph 10.8.

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel x – Staircase function	-	Disabled enabled
<i>It enables or disables the staircase function.</i>		
Channel x – Staircase function – Staircase time	Staircase function = enabled	00:00:30 hh:mm:ss [range 00:00:03 ... 04:39:37]
<i>Duration of the staircase light on period. This is the time indicated in the figure as "Ts" in paragraph 10.8 of the description of the function.</i>		
Channel x – Staircase function – Manual OFF	Staircase function = enabled	Disabled enabled
<i>When enabled, it allows you to end the staircase time with an "Off" command. The command can be sent at any time, including the pre-warning period.</i>		
Channel x – Staircase function – Retriggerable	Staircase function = enabled	Disabled enabled
<i>When enabled, it allows you to restart the staircase time with an "On" command. The command can be sent at any time, including the pre-warning period.</i>		
Channel x – Staircase function – Pre-warning	Staircase function = enabled	Disabled enabled
<i>It activates the pre-warning feature. For further details, see the paragraph describing the function.</i>		
Channel x – Staircase function – Pre-warning – Pre-warning time	Staircase function = enabled Pre-warning = enabled	00:00:10 hh:mm:ss [range 00:00:02 ... 04:39:37]
<i>Specifies how long before expiration the output should be briefly interrupted for signalling. The specified interval includes the duration of the interruption. The maximum value that can be set is 04:39:37. This is the time indicated in the figure as "Tp-w" in paragraph 10.8.</i>		
Channel x – Staircase function – Pre-warning – Interruption time (ms)	Staircase function = enabled Pre-warning = enabled	500 ms [range 250 ... 1000]
<i>It specifies the duration of the interruption time. This is the time indicated in the figure as "Ti" in paragraph 10.8.</i>		

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Staircase start/stop command	Output 1 = enabled Staircase function = enabled	1 bit	C-W--	[1.010] 1-bit start/stop	8

Object name	Conditions	Size	Flags	DPT	CO number
	Writing a "Start" value activates the output and starts timing. Once the set time has elapsed, the output is automatically deactivated. If "Manual Off" is enabled, writing a "Stop" value ends timing. If "Retriggerable" is enabled, writing a new "Start" value restarts the timing.				
Output x – Staircase start/stop command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Channel x staircase function = enabled	1 bit	C-W--	[1.010] 1-bit start/stop	33, 58, 83
	See above: x=2,3,4				

11.4.4 Logic function

These parameters are found under the *Channel x - Main* tab, where x = 1 for EK-GD2-TP-1-HV and x = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

For an exhaustive discussion of the staircase light function, refer to paragraph 10.9

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel x – Logic function	-	Disabled enabled
	Enables or disables the conditioning function of the output via logic inputs.	
Channel x – Logic function – Read delay after bus recovery	Logic function = enabled	1000 ms [range 250 ... 10000]
	After bus recovery, the device waits the specified time before evaluating the logical objects configured as inputs; for those for which a value has not yet been received when the time has elapsed, a request is sent on the bus. The maximum value is 10s.	
Channel x – Logic function – Logic operation type	Logic function = enabled	OR AND XOR
	It defines the logical operation to be performed on the inputs.	
Channel x – Logic function – Logic object n	Logic function = enabled	Disabled enabled
	It defines which of the available logical objects to use as inputs. Logical objects configured as disabled are ignored and the related communication objects are not generated. N = 1,...,8.	
Channel x – Logic function – Logic object n – Logic object n negated	Logic function = enabled Logic object n = enabled	No Yes

Parameter name	Conditions	Settings
	Applies a logical negation to the value of the logical object.	



The computation of the logic function is done only if and when at least one of the input logic objects is updated.

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Logic object <i>n</i>	Output 1 = enabled Logic function = enabled	1 bit	CRWTU	[1.001] 1-bit switch	11 ... 18
For each channel the sequence of numbers corresponding to the 8 available logical objects is indicated.					
Uscita <i>x</i> – Oggetto logico <i>n</i>	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output <i>x</i> = enabled Output type = Direct or Copy parameters from channel Channel <i>x</i> logic function = enabled Logic object <i>n</i> = enabled	1 bit	CRWTU	[1.001] 1-bit switch	Output 2: 36 ...43 Output 3: 61 ...68 Output 4: 86 ... 93
See above: <i>x</i> =2,3,4					

11.4.5 Scenes function

These parameters are found under the *Channel x - Main* tab, where *x* = 1 for EK-GD2-TP-1-HV and *x* = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

For an exhaustive discussion of the scenes function, please refer to paragraph 10.12.

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel <i>x</i> – Scenes function	-	Disabled enabled
Enable or disable the scenes management function.		
Channel <i>x</i> – Scenes function – Learning mode	Scenes function = enabled	Disabled enabled
When disabled, the "save scene" commands are simply ignored and only the values assigned in the configuration are used for the scenarios.		
Channel <i>x</i> – Scenes function – Learning mode Download overwrites learned behaviour	Scenes function = enabled Learning mode = enabled	Yes No

Parameter name	Conditions	Settings
	<p>It defines whether updating the program on the device from ETS should overwrite the values associated with the various scenes, stored in the device and coming from previous programming or learning.</p> <p>Note: when the device is commissioned for the first time, this parameter should be set to "Yes" so that the initialization values are written to the device; otherwise, the values of the outputs would be left at "0" (Off) for all scenes.</p>	
Channel x – Scenes function – Scene n	Scenes function = enabled	Disabled enabled
	Enables or disables a new scene code to be associated with the output.	
Channel x – Scenes function – Scene n – Scene number	Scenes function = enabled Scene n = enabled	1...64 (1)
	This is the scene number to associate with the output. The channel will respond (among others) to scene commands that concern the set channel.	
Channel x – Scenes function – Scene n – Activation delay	Scenes function = enabled Scene n = enabled	00:00.000 mm:ss.fff [range 00:00.000 ... 99:59.999]
	Delay between a "recall scene" command and the corresponding switching of the output. The maximum value is 99:59.999 minutes.	
Channel x – Scenes function – Scene n – Output behaviour	Scenes function = enabled Scene n = enabled	Off On
	Value to assign to the output for the specified scene. This is an initialisation value which can remain fixed or, if the learning mode is enabled, be overwritten by a "save scene" command.	
Channel x – Scenes function – Scene n – Output behaviour – Light intensity (%)	Scenes function = enabled Scene n = enabled Output behaviour = On	50 (0 ... 100%)
	Percentage dimming value assigned to the scene, when the output is ON	



- A new "recall scene" command restarts the activation delay.
- If a new "recall scene" command is received during the activation delay, the value of the new command overwrites the previous one, which is therefore lost.
- If learning mode is enabled, the activation delay has no effect on saving, which always takes place immediately.
- If the same scene number is assigned more than once to the same output (with different parameters), the entry at the lowest position will be considered when recalling. Subsequent entries for the same scene number will be ignored.
- The scene function has a lower priority than the forcing or blocking function.

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Scene number	Output 1 = enabled Scene function = enabled	1 Byte	C-W--	[17.001] scene number [18.001] scene control	19
<div><div><div><div><div>1 Byte</div></div><div><div>Bit number</div><div><div>7</div><div>6</div><div>5</div><div>4</div><div>3</div><div>2</div><div>1</div><div>0</div></div></div><div><div><div>scene number (1-64)</div></div><div><div>not used</div></div><div><div>0 = recall, 1 = save</div></div></div></div></div></div>					
Output x – Scene number	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Scene function = enabled	1 Byte	C-W--	[17.001] scene number [18.001] scene control	44, 69, 94
See above: x=2,3,4.					

11.4.6 Night function

These parameters are found under the *Channel x - Main* tab, where x = 1 for EK-GD2-TP-1-HV and x = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

For an exhaustive discussion of the scenes function, please refer to paragraph 10.13.

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel x – Night function	-	Disabled enabled
<i>Enable or disable the night function.</i>		
Channel x – Night function – Night mode signal	Night function = enabled	Not inverted inverted
<i>Used to invert the night function signal.</i>		
Channel x – Night function – Night mode signal – Light intensity (%)	Night function = enabled	50 (0...100%)
<i>Sets the maximum dimming percentage value to use when the night function is active.</i>		

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Night mode command	Output 1 = enabled Night function = enabled	1 bit	C-W--	[1.003] enable	25
<i>It allows to enable or disable the night function.</i>					
Output x – Night mode command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Night function = enabled	1 bit	C-W--	[1.003] enable	50, 75, 100
<i>See above: x=2,3,4..</i>					

11.4.7 Counter function (energy and hours counter)

These parameters are found under the *Channel x - Main* tab, where x = 1 for EK-GD2-TP-1-HV and x = 1, 2, 3, 4 for EK-GD1-TP-4-HV and EK-GD1-TP-4-HV-N.

This function allows an approximate count of the absorbed energy by accumulating the activity time of an output.

For an exhaustive discussion of the scenes function, please refer to paragraph 10.14

The communication object for a specific channel is only available if the Output type is set as *Direct* or *Copy parameters from channel*.

Parameter name	Conditions	Settings
Channel x – Counter function	-	Disabled enabled
<i>Enables or disables the runtime totalization function.</i>		
Channel x – Counter function – Output load (W)	Counter function = enabled	50 (0...5000 W)
<i>Set the output load value.</i>		
Channel x – Counter function – Cyclic sending	Counter function = enabled	00:00:00 hh:mm:ss [range 00:00:00 ... 04:39:37]
<i>Sets the period for sending the counter status objects on the bus. Note: if the period is set to 00:00:00, then objects are sent only when the counter changes by 1 Wh or the hour counter by 1h.</i>		

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Energy counter (Wh)	Output 1 = enabled Counter function = enabled	4 bytes signed value	CR-T-	[13.010] Active energy (Wh)	20
<i>Current counter value of the energy absorbed by the load.</i>					

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – Energy counter reset command	Output 1 = enabled Counter function = enabled	1 bit	C-W--	[1.015] Reset	21
<i>Resets the energy counter value.</i>					
Output 1 – Hours counter	Output 1 = enabled Counter function = enabled	2 bytes unsigned value	CR-T-	[7.007] time	22
<i>Current value of the operating time counter for the output 1.</i>					
Output 1 – Hours counter reset	Output 1 = enabled Counter function = enabled	1 bit	C-W--	[1.015] reset	23
<i>It resets the value of the operating time counter for the output 1.</i>					
Output 1 – Hours counter overflow	Output 1 = enabled Counter function = enabled	1 bit	CR-T-	[1.005] alarm	24
<i>Alarm transmitted when the output 1 operating time totalizer reaches the limit value of 65535 hours.</i>					
Output x – Energy counter (Wh)	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale Counter function = enabled	1 bit	C-W--	[1.003] enable	45, 70, 95
<i>Current counter value of the energy absorbed by the load. x=2,3,4.</i>					
Output x – Energy counter reset command	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale Counter function = enabled	1 bit	C-W--	[1.015] Reset	46, 71, 96
<i>Resets the energy counter value. x=2,3,4.</i>					
Output x – Hours counter	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale Counter function = enabled	2 bytes unsigned value	CR-T-	[7.007] time	47, 72, 97
<i>Current value of the operating time counter for the specified output. x=2,3,4.</i>					

Object name	Conditions	Size	Flags	DPT	CO number
Output x – Hours counter reset	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale Counter function = enabled	1 bit	C-W--	[1.015] reset	48, 73, 98
It resets the value of the operating time counter for the specified output. x=2,3,4.					
Output 1x– Hours counter overflow	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale Counter function = enabled	1 bit	CR-T-	[1.005] alarm	49, 74, 99
Alarm transmitted when the output x operating time totalizer reaches the limit value of 65535 hours. x=2,3,4.					

11.5 Alarms

If the *Output type* of a channel is set as *Independent* or *Copy parameters from channel*, two communication objects relating to short-circuit and open load alarms are also available.

The details are given in paragraph 10.7

Object name	Conditions	Size	Flags	DPT	CO number
Output 1 – short circuit alarm	Output 1 = enabled	1 bit	CR-T-	[1.005] alarm	26
Short-circuit alarm status.					
Output x – short circuit alarm	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale	1 bit	CR-T-	[1.005] alarm	51, 76, 101
See above: x=2,3,4.					
Output 1 – open load alarm	Output 1 = enabled	1 bit	CR-T-	[1.005] alarm	27
Open load alarm status.					
Output x – open load alarm	Product type = EK-GD1-TP-4-HV or EK-GD1-TP-4-HV-N Output x = enabled Output type = Direct or Copy parameters from channel Copia i parametri dal canale	1 bit	CR-T-	[1.005] alarm	52, 76, 102
See above: x=2,3,4.					

12. KNX communication objects summary

Below is a list of the KNX communication objects with the corresponding *Data Point Types* (DPT) defined by the application program according to the configurations made.

The order of the list is generically by object number.

Object name	Dimens.	Flags	DPT	Comm. Obj. number
Power alarm status	1 bit	CR-T-	[1.5] DPT_Alarm	1
Auxiliary output status	1 bit	CR-T-	[1.2] DPT_Bool	2
Output x – ON/OFF command	1 bit	C-W--	[1.1] DPT_Switch	3, 28, 53, 78
Output x – Dimming command	4 bit	C-W--	[3.7] DPT_Control_Dimming	4, 29, 54, 79
Output x – Absolute setpoint control	1 byte	C-W--	[5.1] DPT_Scaling	5, 30, 55, 80
Output x – ON/OFF status	1 bit	CR-T-	[1.1] DPT_Switch	6, 31, 56, 81
Output x – Actual dimming value	1 byte	CR-T-	[5.1] DPT_Scaling	7, 32, 57, 82
Output x – Staircase start/stop command	1 bit	C-W--	[1.10] DPT_Start	8, 33, 58, 83
Output x – Lock command	1 bit	C-W--	[1.3] DPT_Enable	9, 34, 59, 84
Output x – Forcing command	2 bit	C-W--	[2.1] DPT_Switch_Control	10, 35, 60, 85
Output x – Logic object 1	1 bit	CRWTU	[1.1] DPT_Switch	11, 36, 61, 86
Output x – Logic object 2	1 bit	CRWTU	[1.1] DPT_Switch	12, 37, 62, 87
Output x – Logic object 3	1 bit	CRWTU	[1.1] DPT_Switch	13, 38, 63, 88
Output x – Logic object 4	1 bit	CRWTU	[1.1] DPT_Switch	14, 39, 64, 89
Output x – Logic object 5	1 bit	CRWTU	[1.1] DPT_Switch	15, 40, 65, 90
Output x – Logic object 6	1 bit	CRWTU	[1.1] DPT_Switch	16, 41, 66, 91
Output x – Logic object 7	1 bit	CRWTU	[1.1] DPT_Switch	17, 42, 67, 92
Output x – Logic object 8	1 bit	CRWTU	[1.1] DPT_Switch	18, 43, 68, 93
Output x – Scene number	1 byte	C-W--	[17.1] DPT_SceneNumber [18.1] DPT_SceneControl	19, 44, 69, 94
Output x – Energy counter (Wh)	4 byte	CR-T-	[13.10] DPT_ActiveEnergy	20, 45, 70, 95
Output x – Energy counter reset command	1 bit	C-W--	[1.15] DPT_Reset	21, 46, 71, 96
Output x – Hours counter	2 byte	CR-T-	[7.7] DPT_TimePeriodHrs	22, 47, 72, 97
Output x – Hours counter reset	1 bit	C-W--	[1.15] DPT_Reset	23, 48, 73, 98
Output x – Hours counter overflow	1 bit	CR-T-	[1.5] DPT_Alarm	24, 49, 74, 99
Output x – Night mode command	1 bit	C-W--	[1.3] DPT_Enable	25, 50, 75, 100
Output x – Short circuit alarm (*)	1 bit	CR-T-	[1.5] DPT_Alarm	26, 51, 76, 101
Output x – Open load alarm (*)	1 bit	CR-T-	[1.5] DPT_Alarm	27, 52, 77, 102

(*) Available for EK-GD2-TP-1-HV and EK-GD1-TP-4-HV only

13. Appendix

13.1 Warnings

- Installation, electrical connection, configuration and commissioning of the device can only be carried out by qualified personnel.
- Opening the housing of the device causes the immediate end of the warranty period.

13.2 Return of defective products

Defective ekinex® KNX devices can be returned for repair / replacement following the procedure detailed below.

13.2.1 Devices purchased directly from ekinex®

Request an RMA number by sending an E-Mail to the address support@ekinex.com with following mandatory information:

- Exact device model
- Device serial number (can be found on the product label)
- Date of purchase / Order reference
- Detailed description of the fault or issue

The technical assistance team will contact you as quickly as possible to either investigate the problem further, suggest possible solutions or authorize the return of the device for replacement or repair.

If the device should be returned, it should be shipped to the following address:

EKINEX S.p.A. - Via Novara, 37 / SP229 - I-28010 Vaprio d'Agogna (NO) - Italy.

Further arrangements will be made with the technical support team, according to the type of issue and device.

13.2.2 Devices purchased through ekinex® resellers

If the device has been purchased through a reseller, please refer to the reseller's technical support contact. Depending on the issue and other factors, at the decision of ekinex® and after agreement with the reseller, the customer might be instructed to contact ekinex® directly according to the procedure above.

13.3 Further information

This application manual is aimed at installers, system integrators and planners

For further information on the product, please contact the ekinex® technical support at the e-mail address: support@ekinex.com or visit the website www.ekinex.com

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