



# LUZEN ONE

Universal Dimmer

**ZN1DI- 4001**



Edition 5

Version 2.1

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# 1. OVERVIEW

## 1.1.PRODUCT

The Dimmer **LUZEN ONE** operates according to the phase control or cut on principle and enables the switching/dimming of the different light points connected to the Dimmer Channel, adjusting automatically the parameterized values.

Up to 9 different functions available, among those that stand out:

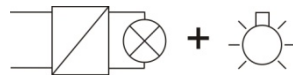
- Configuration of "**Timers**" and "**Flashing**"
- Configuration of "**Scenes**" and "**Sequences**"
- **Secondary ON/OFF** available
- **Blocking** option available

### 1.1.1. LOAD MIXING

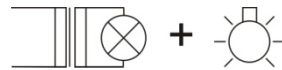
The Dimmer **LUZEN ONE** allows the load mixing in the Dimmer Channel Output.

Ohmic loads, as well as inductive and capacitive ones may be connected to the Dimmer Channel with a maximum wattage of approx. 400 W/VA (phase control), having always on mind the following restrictions:

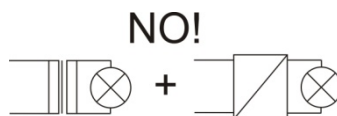
For mixed loads with conventional transformers, do not exceed a 50% share for the ohmic load (incandescent lamps, HV halogen lamps).



Conventional ohmic loads can be installed together with capacitive loads (Electronic transformer) in any proportion.



Do not connect capacitive loads and electronic transformers together with inductive loads, e.g. conventional transformers



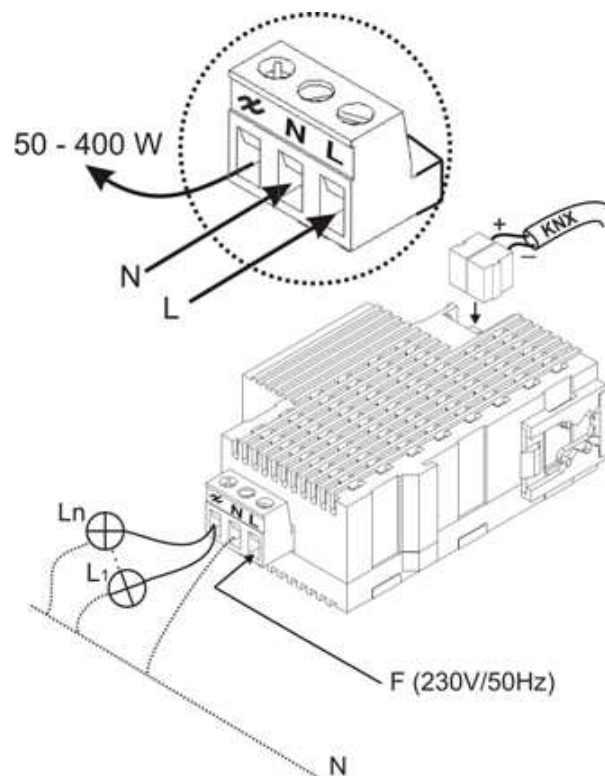
## 1.1.2. WIRING

The **Bus** connection is carried out via the bus connecting terminal included with the device. The cable to the load and the mains voltage are connected via plug-in terminals with a screw connection. The cables can be screwed onto the plug-in terminal before installing the device and then inserted at a later date.

The insertion of the terminal may not take place in the energized state of the device.

All the devices that are installed next to the dimming actuator must at least be equipped with basic insulation.

Next picture shows a device connection schematic.



Please refer to the product **Data Sheet** where you will find detailed information on the device technical characteristics, as well as installation and security information of the Dimmer **LUZEN ONE**.

The product **data sheet** is included in the original product packaging, and is also available to be downloaded from the Web [www.zennio.com](http://www.zennio.com)

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Access via ETS to the Main Parameterization Screen, shows two main sections:

<<**GENERAL**>>

<<**FUNCTIONS**>>

Every section, as well as the functionality description of the device, is detailed next:

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## 2. GENERAL

This section of the settings allows to determine several global characteristics of the device.

- **TYPE OF LOAD:** It will be the integrator who determine the type of load control by the actuator. This parameter provides the following selectable options:

1. Inductive
2. Inductive-Resistive
3. Resistive
4. Capacitive-Resistive
5. Capacitive

Before explaining the different parameterization sections, it is necessary to mention an essential characteristic of the Dimming actuator, the "**Smooth ON**" or "**Smooth Step**".

So called at a softly change of the brightness intensity managed by de Dimmer Channel. One of the main advantages of this feature, is the avoiding of a sudden temperature change in the filaments of the light points during the switching On/Off , which implies a significant increase on the average lifespan of the bulbs,.....

This section of the parameterization environment allows the integrator to set the duration of this "**Smooth ON**" or "**Smooth Step**", as well as customizing some aspects relative to the maximum brightness to be emitted by the light points managed by the Dimmer Channel.

- **REGULATION STEP DURATION (Smooth):** This parameter sets the time the Dimmer takes to softly pass from 0% (Off) to a 100% brightness percentage (On) in the Dimmer Channel Output. The same can be said for the "Off to On" status change.

*Note: This time can be extrapolated to the Dimmer internal calculation when the device has to pass from 50% to 100% (in this case, the time the Dimmer takes will be half of the value parameterized in this field).*

- **MAX LIGHTING LEVEL:** Allows the integrator to customize the maximum brightness level to be applied to the Dimmer Channel Output.
  - **Normal:** Corresponding with the 100% brightness level.
  - **Eco Mode:** Customize the maximum brightness level applied to the Dimmer Channel Output.
    - ✓ NEVER EXCEED X% ENERGY LEVEL: The valid setting range for this field is [20%.....99%].

## 3. FUNCTIONS

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The Dimmer **LUZEN ONE** has up to nine different functions to be enabled.

Every available function is detailed next:

### 3.1.STATUS OBJECT

This function allows the integrator to independently enable the 1 bit (On/Off) and/or the 1 byte (percentage) Status Objects in the Channel Output.

These objects are meant to feedback switching and value stats of the dimming actuator.

- **1 BIT (ON/OFF):** Enable a 1 bit Status Object; in charge of updating the **ON/OFF** status of the Dimmer Channel when required.
  - **SENDS "1" WHEN:** This parameter allows the integrator to set when the Channel Status output signal will be sent to the **BUS**.
    - ✓ **Totally On:** Corresponding with the 100% brightness percentage.
    - ✓ **Partially On:** Any brightness percentage within the range [1%...99%] will be always considered by the Dimmer as **ON** (for status updating purposes), in the same way, any other percentage will be considered as an **OFF** (except the 100% lighting level).
- **1 BYTE (PERCENTAGE):** Enable a 1 byte Status Object, in charge of the real-time updating of the Dimmer Status Channel, showing with **precision of "+-1 %"**, the brightness level applied to the Dimmer Channel output when required.

*Note: 100% will be always considered as an **ON** for any purpose.*

### 3.2.SIMPLE TIMER

It is possible to control the Dimmer Channel Output in a temporized way by applying delays for the **Channel ON**, as well as for the **OFF**. In addition to this, it is also possible to set by parameter the **ON duration**.

This is a normal temporization the Dimmer applies to the Channel output when receiving a "1" through the object "**Timer**".

- **ON DELAY:** This parameter sets the elapsed time between the "ON" order (over the "**Timer**" object) and the "ON" Channel Output switching. This value must be set with precision to tenths of a second (e.g. to get "2.5" seconds, set "25"). If no delay is needed, please set "0" in this field.
- **OFF DELAY:** This parameter sets the elapsed time between the "OFF" order (over the "**Timer**" object) and the "OFF" Channel Output switching. Similar to the "On Delay" working.
- **ON DURATION:** This parameter sets the time the Channel Output remains **ON** before switching to **OFF**. Setting "0" in this field means unlimited duration.

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Operation of "Delays" and "Timers" is detailed next:

- When a "1" is sent to the object "**Timer**", an ON order is sent to the Channel Output applying the "On Delay" and the "On Duration"
- When a "0" is sent to the object "**Timer**", an OFF order is sent to the Channel Output applying the "Off Delay".

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- **MULTIPLY:** Consists in increasing (multiply) the timer as many times as the value "1"/ "0" is received through the object "**Timer**".

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The multiplying operation is detailed next:

- **No multiply:** If during a temporized **ON**, a "1" is received through the object "Timer", the Dimmer Luzen will start counting again the time set in the "On duration" field.
  - **Multiply:** If during a temporized **ON**, a "1" is received through the object "Timer", the Dimmer Luzen doubles the time set in the "On duration" field. If another "1" is received, the time triples, and so on. Similar to the Temporized Off.
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### 3.3.FLASHING

This function allows the integrator to conduct a sequence of type **ON-OFF-ON-OFF**.... in the Dimmer Channel Output, as well as to set the **On/Off** duration of the flashing applied in the output.

Therefore, the number of repetitions can be set (up to a maximum of 255), as well as the status the Dimmer output will remain, after last repetition.

The Flashing function starts by sending a "1" to the object "**Flashing**", and stops sending a "0".

- **ON DURATION:** Set the time the output will remain **ON** when the Flashing function is active.
- **OFF DURATION:** Set the time the output will remain **OFF** when the Flashing function is active.
- **REPETITIONS:** Select the number of repetitions to carry out when the Flashing function is active. For an unlimited number of repetitions, please set the value "0" in this field.
- **STATUS AFTER LAST REPETITION:** Allows the integrator to set the Dimmer Channel Output status after the last Flashing repetition.

***Note:** Both functions "Simple Timer " and "Flashing" are independent from each other, and also independent from the normal "ON/OFF" and the Secondary "ON/OFF Control", as all of them are managed from four different communication objects.*

***Example:** When an ON order is sent to the object "Timer", a temporized ON starts in the Dimmer Channel Output. If before this comes to the end, an OFF order is sent to the object "ON/OFF", the output will switch off and the temporization will finish. In fact, any other order sent to the Dimmer will finish the temporization.*

### 3.4.SCENES

Scenes or “lifestyles” consist of a synchronized activation of some devices in our domotic installation, so that different predefined atmospheres are generated.

This function allows the integrator to control the Dimmer Channel Output through the object "Scenes", using 1 byte objects.

The **DPT** (Datapoint Type) **Scene Control** is a 1 byte Object with the following format:

C	R	N Scene Number
---	---	----------------

1 bit	1 bit	6 bits
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- **C**     **0** = Activate the Scene corresponding to the field Scene.  
          **1** = Learn the Scene corresponding to the field Scene.
- **R**     **Reserved Field with Value “0”**
- **N**     **Scene Number Range [0.....63]**

A single Communication Object will be valid to Activate Scenes and/or Learn them (depending on the C-value).

***Note I:** If C=0, the DPT valid range is [0....63], whereas if C=1, the DPT valid range is [128.....191]*

***Note II:** Activate Scene 1 ≡ DPT=0*

*Activate Scene 2 ≡ DPT=1*

....

*Activate Scene 64≡ DPT=63*

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*Learn Scene 1 ≡ DPT=128*

*Learn Scene 2 ≡ DPT=129*

....

*Learn Scene 64≡ DPT=191*

Up to five different scenes may be configured through two different parametrizable fields:

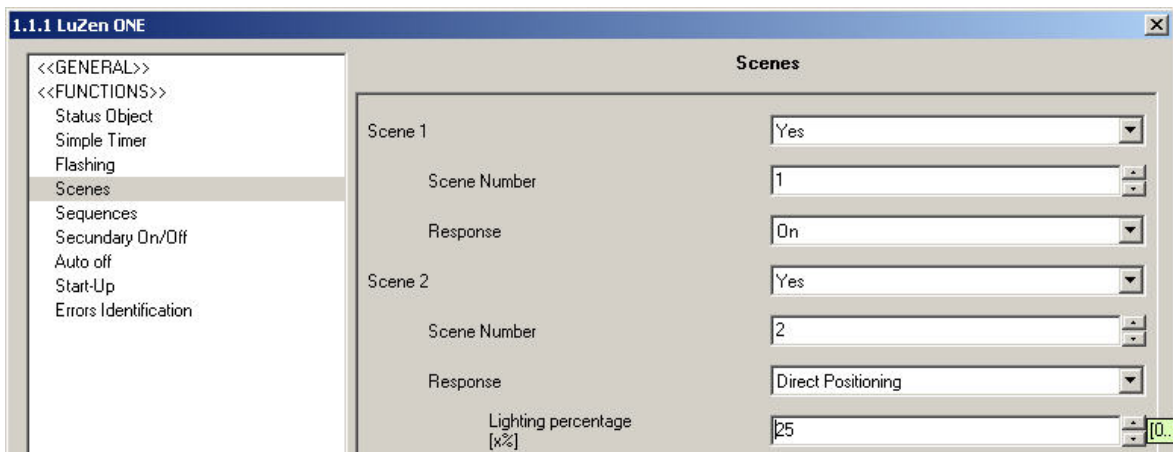
- **SCENE NUMBER:** This is a number defined by the user to identify the scene or the “lifestyle” to be created.
  
- **RESPONSE:** Set the order the Dimmer Channel Output must conduct when the corresponding scene number is received through the object "Scenes". Possible responses are:
  - **Off / Smooth Off**
  - **On / Smooth On**
  - **Positioning / Smooth Positioning:** When setting one of this two options, a new parameter appears
    - ✓ **LIGHT PERCENTAGE (%):** Set the brightness percentage the Channel Output will remain, when a 1 byte Scene Control object is received through the object "Scenes".

***Example:** Two different scenes parameterized on an installation (Nº1 & Nº 2). Responses of the Dimmer will be:*

*Scene 1: ON*

*Scene 2: Smooth Positioning 25%*

The parameterization environment will remain as follows:



### 3.5.SEQUENCES

This function allows the integrator to control the Dimmer Channel Output through the object “**Sequences**”, using for it (1 byte) **BUS** Scenes.

A **sequence** consists of a Dimmer Channel Output programming in steps, phases or actions, up to a maximum of 4. Every action can be parameterized via 2 different fields, "Response" and "Duration".

Sequences are activated via the same DPT explained in **Section 3.4 Scenes**, by sending it to the object "**Sequences**". Up to a maximum of five different sequences can be programmed through two different parametrizable fields.

- **SEQUENCE NUMBER:** This is a number defined by the user to identify the sequence to be created.
- **NUMBER OF ACTIONS:** Set the number of stages in which the sequence will be divided [1...4]

For every enabled stage, two new parameterizable fields appear:

- **RESPONSE:** Set the order the Dimmer Channel Output must conduct when the corresponding sequence number is received through the object "Sequences". Possible responses are:
  - **Off / Smooth Off**
  - **On / Smooth On**
  - **Positioning / Smooth Positioning:** When setting one of this two options, a new parameter appears
- **LIGHT PERCENTAGE (%) :** Set the brightness percentage the Channel Output will remain, when a 1 byte Sequence Control object is received through the object "Sequences".
- **DURATION:** Set the time the corresponding action will last, up to a maximum of 255 minutes.
- **FINAL STATUS:** Set the status the Channel Output will remain when the last action of a sequence finishes.

### 3.6.BLOCK

This function makes possible to block the Dimmer Channel Output, in other words, to disable the Channel Output.

The Channel Output is blocked by sending a "1" to the object “**Block**” and unblocked by sending a “0”.

*Note: All the orders sent to the Dimmer while being blocked, will be lost.*

### 3.7. SECONDARY ON/OFF

This feature gives the integrator the possibility to enable a "Secondary ON/OFF" to customize the ON/OFF brightness level of the Channel output, and at the same time defining if the switching will be immediate or soft.

*Note: This function is totally independent from the "Normal On/Off", as it has an specific communication object for it.*

*Example: Guess that besides the "Normal On/Off"; it is necessary an specific brightness level and Dimmer response, e.g: children bedrooms, in hospitals, with patients... where the maximum brightness level may be harmful in the presence of these people.*

*In this cases, the "Secondary On/Off "may be really useful, as we will always have both options (Normal On/Off & Secondary On/Off) to choose, depending on the situation.*

- **LIGHTING LEVEL WHEN "OFF":** This field allows the integrator to define the brightness percentage for the secondary OFF order.
- **OFF STEP LEVEL:** Define whether the OFF will be immediate or soft (smooth)
- **LIGHTING LEVEL WHEN "ON":** This field allows the integrator to define the brightness percentage for the secondary ON order.
- **ON STEP LEVEL:** Define whether the OFF will be immediate or soft (smooth)

### 3.8. ON/OFF MEMORY

This new functionality allows restoring Dimmer on the percentage of light to which it was before it was turned off (ON / OFF Power Memory).

A new feature can be enabled on the ETS settings environment. This feature allows you to enable the Object Communication "On / Off (Memory)"

- **OFF STEP:** Set Dimmer response to shut down "immediately" or "softly" (see general parameters, duration of the transition from regulation)
- **ON STEP:** Set Dimmer response to achieve the percentage of light stored in memory for the ON, "immediately" or "softly" (see general parameters, duration of the transition from regulation)

*Note I: The "On / Off (Memory)", just keep the percentage of light in memory solely when the dimmer is turned off by Communication Objects "On / Off (immediate)" On / Off (Soft) "u "On / Off (Memory)."*

*Note II: If an order is sent on through the "On / Off (Memory)" and it was already turned on (at a rate higher than "0%"), the dimmer will respond with a 100% On*

**Note III:** *The "On / Off (Memory)", just keep a percentage of light other than "0" prior to Off. If you send a 0% rate, or decrease the brightness one step leaving it to "0%", and then makes an Off (immediate, smooth or memory), the "On (Memory), other than the percentage recovered There was zero just prior to 0%.*

### 3.9. AUTO OFF

The loads managed by the Dimmer Channel, may be automatically turned off by the LUZEN ONE, within two limits set by parameter.

The "**Auto Off**" function considers the time the Channel Output falls below certain threshold brightness level, and after this time, the Dimmer proceeds to send the "**Auto Off**" order.

- **THRESHOLD LEVEL:** Set the brightness percentage the device will consider when proceeding to an "Auto OFF" order.
- **TIME:** Set the time after which, taking into account the parameter above "Level", the Dimmer will execute the OFF order.

**Note:** *The Auto-Off function is not object dependant. This is an internal operation executed by the Dimmer, where only the 2 parameters defined above are considered.*

### 3.10. START UP

This function allows integrators to preset the Dimmer behaviour (ON, OFF or Positioning) on BUS voltage return (after a Power Failure) or after programming the device with the ETS; additionally the initial status of the load after "**Open Circuit**" error detection, and its later solution, can be set by parameter.

- **INITIAL STATUS:** Choose the initial status of the Dimmer Channel. The option "**Last Saved Position**" means that the Channel Output will remain just as it was before the BUS Power Failure.
  - **LIGHTING PERCENTAGE (%):** When the "**Positioning**" option is selected in the field above, this parameter sets the specific brightness level the Dimmer Channel output will remain.
- **INITIAL STATUS ON LOAD RECOVERY:** To set the Channel Load initial status when this is redetected after "**Open Circuit**" detection The "**Last saved status**" option means that the Channel Output will remain as it was before the "**Open Circuit**" detection.
  - **BRIGHTNESS PERCENTAGE (%):** When the "**Positioning**", option is selected in the field above, this parameter specifies the exact brightness percentage the Dimmer Channel Output will remain after the "Open Circuit" circumstance has been solved.
- **UPDATE:** This parameter offers the option to update the rest of devices in the installation by sending the Dimmer initial status to the BUS.

- **START-UP SENDING DELAY:** This field allows the integrator to set a delay (in seconds) to put off the initial status sending, until the rest of devices on the installation are completely initiated, this way the installer will make sure that the Start-Up configuration will be received by all the devices in the installation.

*Note I: To get an immediate sending (no delay), set the value "0" in this field.*

*Note II: The Start-Up Status sending is always done through the Status Object.*

### 3.11. ERRORS IDENTIFICATION

Protection against short circuits, open circuits, overload and over temperature is integrated within the dimmer.

When any of these protective measures respond, the brightness set for the lights connected will go down or a cut-off will be triggered.

Subsequent to the elimination of the error, the device will be back to normal after a short cool-down period.

*Nota: Centralised multi-service control pulses from power stations may become perceptible by shorttime flickering at low dimming positions.*

In order to identify possible errors in the Dimming actuator behaviour, as well as to know the response to these situations, the four protection functions are detailed next:

#### 3.11.1. OPEN CIRCUIT PROTECTION

The response to an open circuit detection will be as follows:

- A "1" will be internally sent through the "Opened Circuit" Communication Object disabling the device.
- If the Channel Output was in an ON status, the status object will be turned into "0" and sent to the BUS.
- The Dimming actuator itself periodically checks whether the abnormal situation is corrected
- Once the open circuit situation is corrected, a "0" will be internally sent through the "Opened Circuit" Communication Object, and the Dimming actuator will be ready again to receive new orders from the BUS.

#### 3.11.2. SHORT CIRCUIT PROTECTION

The response to short circuit detection will be as follows:

- A "1" will be internally sent through the "**Short Circuit**" Communication Object disabling the device
- If the Channel Output was in an ON status, the status object will be turned into "0" and sent to the **BUS**.
- The Dimming actuator itself periodically checks whether the abnormal situation is corrected
- Once the short circuit situation is corrected, a "0" will be sent through the "**Short Circuit**" Communication Object, and will be ready again to receive new orders from the **BUS**.

### 3.11.3. OVERLOAD PROTECTION

The response to overload detection will be as follows:

- A "1" will be internally sent through the "**Overload**" Communication Object disabling the device
- If the Channel Output was in an ON status, the status object will be turned into "0" and sent to the **BUS**.
- The Dimming actuator itself periodically checks whether the abnormal situation is corrected
- Once the overload situation is corrected, a "0" will be sent through the "**Overload**" Communication Object, and will be ready again to receive new orders from the **BUS**.

### 3.11.4. OVER TEMPERATURE PROTECTION

The Dimmer **LUZEN ONE** has an internal protection system to automatically regulate the Channel load when the internal temperature of the device is excessive.

There are two different types of response depending on the internal Temperature of the device:

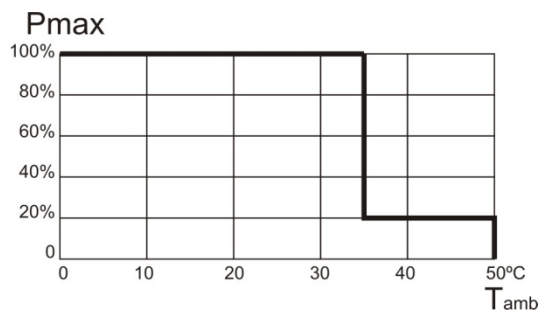
- Temperature in the range [75°C....85°C]
  - ✓ A "1" will be sent through the "**OverTemperature**" Communication Object adjusting itself to the 20% brightness
  - ✓ The Dimming actuator itself periodically checks whether the abnormal situation is corrected
  - ✓ After cooling down, the dimming actuator will send a "0" through the "**OverTemperature**" Communication Object,

and will be ready again to receive new orders from the **BUS**.

- **Temperature over 85°C :** The only difference with the case explained above is that, if temperature is over 85°C, the Channel Output Status Object is also sent to the BUS.

*Note I: The internal Temperature of the Dimmer must be considered as:*

$$\text{Internal } T^a = \text{Ambient } T^a + \text{Real Internal } T^a \text{ inside the device}$$



*Note II: When the Ambient Temperature is high, the Dimmer adjusts itself to the 20% brightness (according to the diagram), avoiding any problem arisen from an excessive over heating that could be harmful for the electronic of the device*

## ANNEX I: COMMUNICATION OBJECTS

SECTION	NUMBER	SIZE	IN/OUT	FLAGS	VALUE			NAME	DESCRIPTION
					RANGE	1st Time	RESET		
COMMON	0	1bit	I	W	0/1	Any	Any	ON/OFF (immediate)	0= OFF (immediate) 1= ON (immediate)
	1	1 bit	I	W	0/1	Any	Any	ON/OFF (soft)	0=OFF; 1= ON (soft)
	2	4 bits	I	W	0/1	Any	Any	Light Dimming	4 bits Control
	3	1 byte	I	W	0/1	Any	Any	Light Precise Dimming (immediate)	1 byte Control (immediate)
	4	1byte	I	W	0-63 128-192	Any	Any	Light Precise Dimming (soft)	1 byte Control (soft)
STATUS OBJECT	5	1 bit	O	R-T	0/1	0	Previous	ON/OFF Status	0= OFF 1= ON
	6	1byte	O	R-T		0	Previous	Light Status	0%= OFF 1%.....100%= ON
SIMPLE TIMER	7	1 bit	I	W	0/1	Any	Any	Timer	0=Timer OFF 1=Timer ON
FLASHING	8	1 bit	I	W	0/1	Any	Any	Flashing	1=Start Flashing 0=End Flashing
SCENES	9	1byte	I	W	0-63 128-192	Any	Any	Scenes	0= Scene 1 ..... ..... 63= Scene 64
SEQUENCES	10	1byte	I	W	0-63 128-192	Any	Any	Sequences	0= Scene 1 ..... ..... 63= Scene 64
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	Any	Any	Secondary On/Off	1= Secondary On 0= Secondary Off
OPEN CIRCUIT ERROR	13	1 bit	O	R-T	0/1	0	0	Open Circuit	1= Open Circuit 0= Closed Circuit
SHORT CIRCUIT ERRORS	14	1 bit	O	R-T	0/1	0	0	Short Circuit	1= Shortcircuit 0= No Shortcircuit
OVERLOAD ERROR	15	1 bit	O	R-T	0/1	0	0	Overload	1= Overload 0= No Overload
OVER TEMPERATURE ERROR	16	1 bit	O	R-T	0/1	0	0	Over Temperature	1= Over Temperature 0= No Over Temperature



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