

# MINIBOX 25

## Multifunction Actuator with 2 Outputs and 5 Inputs

**ZN1IO-MN25**

Application program version: [1.0]  
User manual edition: [1.0]\_a

[www.zennio.com](http://www.zennio.com)

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# 1 INTRODUCTION

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## 1.1 MINIBOX25

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MINIBOX 25 from Zennio is a versatile KNX actuator featuring a wide variety of functions.

The most outstanding features are:

- **2 relay outputs**, configurable as:
  - Up to 1 shutter channel (with or without slats),
  - Up to 2 individual ON/OFF outputs.
- **5 multi-purpose inputs**, configurable as:
  - Temperature probes,
  - Binary inputs (i.e., pushbuttons, switches, sensors),
  - Motion detectors.
- **10 customisable, multi-operation logic functions.**
- **4 independent thermostats.**
- **Scene-triggered action control**, with an optional delay in the execution.
- **Master light control** for an easy, out-of-the-box control of a set of luminaires (or functionally equivalent devices) one of which acts as a general lamp and the others as secondary lamps.
- **Manual operation / supervision** of the 2 or 4 relay outputs through the on-board pushbuttons and LEDs.

## 1.2 INSTALLATION

MINiBOX 25 connects to the KNX bus through the on-board KNX connector.

Once the device is provided with power from the KNX bus, both the individual address and the associated application program may be downloaded.

This device does not need any additional external power since it is entirely powered through the KNX bus.

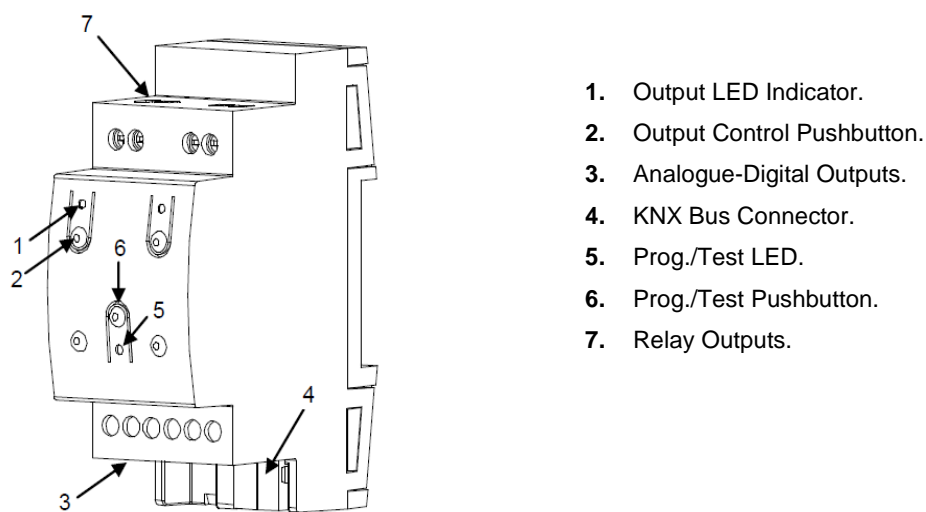


Figure 1. MINiBOX 25. Elements

The main elements of the device are described next.

- **Test/Prog. Pushbutton (6):** a short press on this button sets the device into the programming mode, making the associated LED (5) light in red.

**Note:** if this button is held while plugging the device into the KNX bus, the device will enter into **safe mode**. In such case, the LED will blink in red every 0.5 seconds.

- **Outputs (7):** output ports for the insertion of the stripped cables of the systems being controlled by the actuator (see section 2.3). Please secure the connection by means of the on-board screws.

- **Inputs (3):** input ports for the insertion of the stripped cables of external elements such as switches / motion detectors / temperature probes, etc. One of the two cables of each element needs to be connected to one of the slots labelled “1” to “6”, while the other cable should be connected to the slot labelled as “C”. Note that all the external input devices share the “C” slot for one of the two cables. Please secure the connection by means of the on-board screws.

To get detailed information about the technical features of this device, as well as on the installation and security procedures, please refer to the corresponding **Datasheet**, bundled with the original package of the device and also available at [www.zennio.com](http://www.zennio.com).

### 1.3 START-UP AND POWER LOSS

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During the start-up of the device, the Test/Prog. LED will blink in blue colour for a few seconds before the device is ready. External orders will not be executed during this time, but afterwards.

Depending on the configuration, some specific actions will also be performed during the start-up. For example, the integrator can set whether the output channels should switch to a particular state and whether the device should send certain objects to the bus after the power recovery. Please consult the next sections of this document for further details.

On the other hand, when a bus power failure takes place, the device will interrupt any pending actions, and will save its state so it can be recovered once the power supply is restored. For safety reasons, all **shutter channels** will be stopped (i.e., the relays will open) if a power loss takes place, while the individual outputs will switch to the specific state configured in ETS (if any).

## 2 CONFIGURATION

### 2.1 GENERAL

After importing the corresponding database in ETS and adding the device into the topology of the desired project, the configuration process begins by right-clicking into the device and selecting *Edit parameters*.

#### ETS PARAMETERISATION

The only parameterisable screen that is always available is General. From this screen it is possible to activate/deactivate all the required functionality.

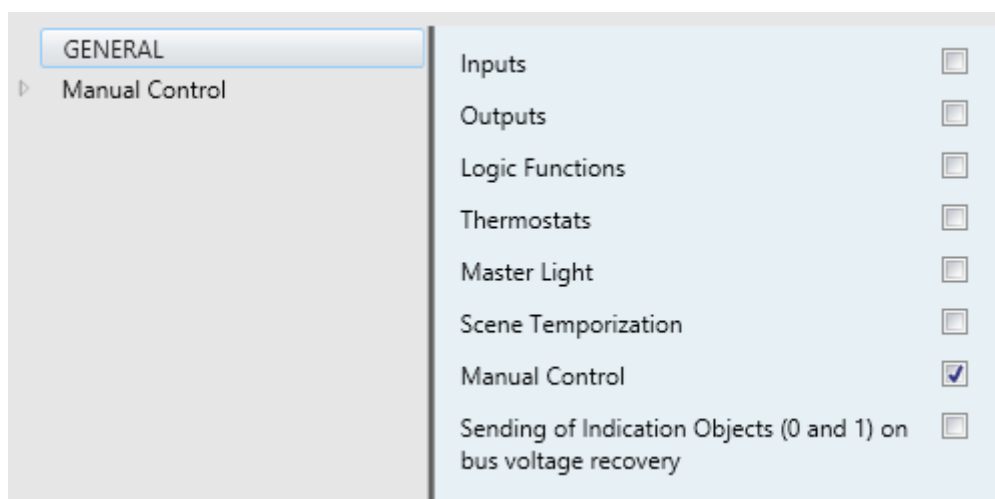


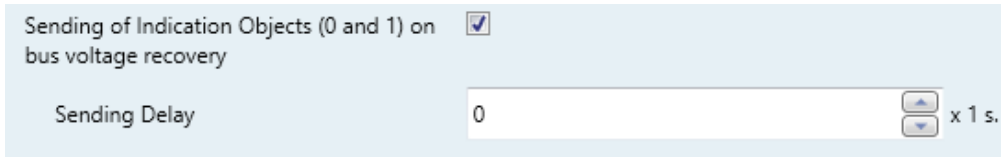
Figure 2. Default screen

- Once activated, **Inputs, Outputs, Logical Functions, Thermostats, Master Light, Scene temporisation** and **Manual control** bring additional tabs to the menu on the left. These functions and their parameters will be explained in later sections of this document.

The **Manual Control** function is enabled by default, and so is the corresponding configuration tab.

- **Sending of Indication Objects (0 and 1) on Bus Voltage Recovery:** this parameter lets the integrator activate two new communication objects ("**Reset 0**" and "**Reset 1**"), which will be sent to the KNX bus with values "0" and "1"

respectively whenever the device begins operation (for example, after a bus power failure). It is possible to parameterise a certain **delay** to this sending (0 to 255 seconds).



The image shows a configuration window with a light blue background. At the top, the text "Sending of Indication Objects (0 and 1) on bus voltage recovery" is followed by a checked checkbox. Below this, the label "Sending Delay" is positioned to the left of a text input field containing the number "0". To the right of the input field is a vertical spinner control with up and down arrows, and the text "x 1 s." is located to the right of the spinner.

**Figure 3.** Sending of Indication objects on bus voltage recovery

## 2.2 INPUTS

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MINiBOX 25 incorporates **5 analogue/digital inputs**, each configurable as a:

- **Binary Input**, for the connection of a pushbutton or a switch/sensor.
- **Temperature Probe**, to connect a temperature sensor (model ZN1AC-NTC68 S/E/F from Zennio).
- **Motion Detector**, to connect a motion detector (models ZN1IO-DETEC-P and ZN1IO-DETEC-X from Zennio).

For detailed information about the functionality and the configuration of the parameters involved, please refer to the following specific manuals, available under the **MINiBOX 25** product section, at the Zennio homepage, [www.zennio.com](http://www.zennio.com)):

- “**Binary Inputs in MINiBOX 25**”,
- “**Temperature Sensor in MINiBOX 25**”,
- “**Motion Detector in MINiBOX 25**”.

### Notes:

- The ZN1IO-DETEC-P motion detector is compatible with a variety of Zennio devices. However, depending on the device it is actually being connected to, the functionality may differ slightly. Therefore, please refer specifically to the aforementioned manual “**Zennio Motion Detector for MINiBOX 25**”.
- Motion detectors with references ZN1IO-DETEC and ZN1IO-DETEC-N are **not compatible** with MINiBOX 25 (may report inaccurate measurements if connected to this device).
- When connected to MINiBOX 25, the rear micro-switch of model ZN1IO-DETEC-P should be set to position “**Type B**”.



## 2.3 OUTPUTS

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The MINiBOX 25 actuator incorporates **2 relay outputs**, each configurable as a:

- **Individual binary outputs**, which allows an independent control of loads.
- **Shutter channels**, which allow controlling the motion of shutters or blinds.

For detailed information about the functionality and the configuration of the related parameters, please refer to the following specific manuals, all of them available at the Zennio homepage ([www.zennio.com](http://www.zennio.com)):

- **Individual outputs in MINiBOX 25.**
- **Shutter channels in MINiBOX 25.**

### 2.3.1 MANUAL CONTROL

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MINiBOX 25 allows manually switching the state of its output relays through the respective pushbuttons on the top of the device. A specific pushbutton is therefore available per output.

Manual operation can be done in two different ways, named as **Test On Mode** (for testing purposes during the configuration of the device) and **Test Off Mode** (for a normal use, anytime). Whether both, only one, or none of these modes can be accessed needs to be parameterised in ETS. Moreover, it is possible to enable a specific binary object for locking and unlocking the manual control in runtime.

**Note:**

- *The **Test Off mode** will be active (unless it has been disabled by parameter) after a download or a reset with no need of a specific activation – the pushbuttons will respond to user presses from the start.*
- *On the contrary, switching to the **Test On mode** (unless disabled by parameter) needs to be done by long-pressing the Prog/Test button (for at least three seconds), until the LED is no longer red and turns yellow. From that moment, once the button is released, the LED light will remain green to confirm that the device has switched from the Test Off mode to the Test On*

mode. After that, an additional press will turn the LED yellow and then off, once the button is released. This way, the device leaves the Test On mode. Note that it will also leave this mode if a bus power failure takes place.

## Test Off Mode

Under the Test Off Mode, the outputs can be controlled through both their communication objects and the actual pushbuttons located on the top of the device.

When one of these buttons is pressed, the output will behave as if an order had been received through the corresponding communication object, depending on whether the output is configured as an individual output or as a shutter channel.

- **Individual output:** a simple press (short or long) will make the output switch its on-off state, which will be reported to the KNX bus through the corresponding status object, if enabled.
- **Shutter Channel:** when the button is pressed, the device will act over the output according to the length of the button press and to the current state.
  - A **long press** makes the shutter start moving (upwards or downwards, depending on the button being pressed). The LED will light in green until the end of the motion. If the button gets pressed being the shutter already at the top or bottom positions, nothing will happen (the LED will not light).
  - A **short press** will make the shutter drive stop (if in motion), as it normally does when a step/stop order is received from the KNX bus. In case of not being the shutter in motion, pressing the button does not cause any action, unless slats/lamellas have been parameterized – in such case, a step movement (up/down, depending on the button pressed) will take place. The status objects will be sent to the bus when corresponding.
- **Disabled output:** outputs disabled by parameter will not react to button presses under the Test Off mode.

Regarding the lock, timer, alarm and scene functions, the device will behave under the Test Off mode as usual. Button presses during this mode are entirely analogous to the reception of the corresponding orders from the KNX bus.

## Test On Mode

After entering the Test On mode, it will only be possible to control the outputs through the on-board pushbuttons. Orders received through communication objects will be ignored, with independence of the channel or the output they are addressed to.

Depending on whether the output has been parameterised as an individual output or as part of a shutter channel, the reactions to the button presses will differ.

- **Individual output:** short or long pressing the button will commute the on-off state of the relay.
- **Shutter channel:** pressing the button will make the shutter drive move upward or downward (depending on the button) until the button is released again, thus ignoring the position of the shutter and the parameterised times.

**Note:** *after leaving the Test On mode, the status objects will recover the values they had prior to entering Test On. As the device is never aware of the actual position of the shutter (as the shutter drive does not provide any feedback), these values may not show the real position. This can be solved by performing a complete move-up or move-down order, or by calibrating the shutter position in the Test On mode until it matches the status objects.*

- **Disabled output:** under the Test On mode, short and long presses will cause the same effect for disabled outputs as for individual outputs (i.e., the relay will switch its state).

The lock, timer, alarm and scene functions will not work while the device is under the Test On mode. Status objects will not be sent to the bus, either.

**Important:** *the device is factory delivered with all the output channels configured as disabled outputs, and with both manual modes (Test Off and Test On) enabled.*

## ETS PARAMETERISATION

The **Manual Control** is configured from the Configuration tab itself under Manual Control.

The only two parameters are:

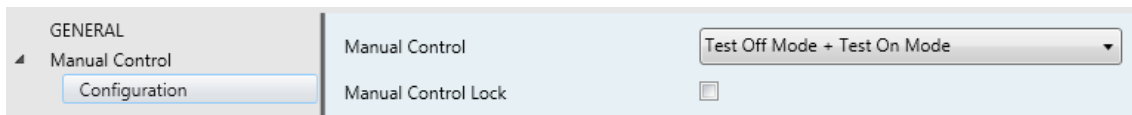


Figure 4. Manual control screen

- **Manual Control:** options are “Disabled”, “Only Test Mode Off”, “Only Test Mode On” and “Test Mode Off + Test On Mode” (default). Depending on the selection, the device will permit using the manual control under the Test Off, the Test On, or both modes. Note that, as stated before, using the Test Off mode does not require any special action, while switching to the Test On mode does require long-pressing the Prog./Test button.
- **Lock Manual Control:** unless the above parameter has been “Disabled”, the Lock Manual Control parameter provides an optional procedure for locking the manual control in runtime. When this checkbox is enabled, object “**Manual Control Lock**” turns visible, as well as two more parameters:
  - **Value:** defines whether the manual control lock/unlock should take place respectively upon the reception (through the aforementioned object) of values “0” and “1”, or the opposite.
  - **Initialization:** sets how the manual control should remain after the device start-up (after an ETS download or a bus power failure): “Unlocked”, “Locked” or “Last Value” (default; on the very first start-up, this will be Unlocked).

## 2.4 LOGIC FUNCTIONS

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This module makes it possible to perform numeric and binary operations to incoming values received from the KNX bus, and to send the results through other communication objects specifically enabled for this purpose.

MINiBOX 25 can implement **up to 10 different and independent functions**, each of them entirely customisable and consisting in **up to 4 consecutive operations each**.

The execution of each function can depend on a configurable **condition**, which will be evaluated every time the function is **triggered** through specific, parameterisable communication objects. The result after executing the operations of the function can also be evaluated according to certain **conditions** and afterwards sent (or not) to the KNX bus, which can be done every time the function is executed, periodically or only when the result differs from the last one.

Please refer to the specific “**Logic Functions module in MINiBOX 25**” user manual (available at the Zennio homepage, [www.zennio.com](http://www.zennio.com)) for detailed information about the functionality and the configuration of the related parameters.

## 2.5 THERMOSTATS

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MINiBOX 25 implements **four Zennio thermostats** which can be enabled and configured independently.

Please refer to the specific “**Zennio Thermostat in MINiBOX 25**” user manual (available at the Zennio homepage, [www.zennio.com](http://www.zennio.com)) for detailed information about the functionality and the configuration of the related parameters.

## 2.6 MASTER LIGHT

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The Master Light function brings the option to monitor the state of up to 12 light sources –or any other functionally-similar element whose state is transmitted through a binary object– and, depending on those states, perform a **master order** every time a certain trigger signal (again, a binary value) is received through a specific object.

Such master order will consist in:

- A **general switch-off** order, if at least one of the up to twelve status objects is found to be on.
- A **courtesy switch-on** order, if none of the up to twelve status objects is found to be on.

Note that the above switch-off and switch-on orders are not necessarily a binary value being sent to the bus – it is up to the integrator the decision of what to send to the KNX bus in both cases: a shutter order, a thermostat setpoint or mode switch order, a constant value, a scene... Only the trigger object and the twelve status objects are required to be binary (on/off).

The most typical scenario for this Master Light control would be a hotel room with a master pushbutton next to the door. When leaving the room, the guest will have the possibility of pressing on the master pushbutton and make all the lamps turn off together. Afterwards, back on the room and with all the lamps off, pressing on the same master pushbutton will only make a particular lamp turn on (e.g., the closest lamp to the door) – this is the courtesy switch-on.

### ETS PARAMETERISATION

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Once the Master Light function has been enabled, a specific tab will be included in the menu on the left. This new parameter screen contains the following options:

- **Number of State Objects:** defines the number of one-bit status objects required. The minimum (and default) value is “1”, and the maximum is “12”. These objects are called “[ML] Status Object *n*”.

- **Trigger Value:** sets the value (“0”, “1” or “0/1”, being the latter the default option) that will trigger, when received through “[ML] Trigger”, the master action (the general switch-off or the courtesy switch-on).

- **General Switch-Off.**

- **Delay:** defines a certain delay (once the trigger has been received) before the execution of the general switch-off. The allowed range is 0 to 255 seconds.
- **Binary Value:** if checked, object “[ML] General Switch-off: Binary Object” will be enabled, which will send one “0” whenever the general switch-off takes off.
- **Scaling:** if checked, object “[ML] General Switch-off: Scaling” will be enabled, which will send a percentage value (configurable in “Value”) whenever the general switch-off takes off.
- **Scene:** if checked, object “[ML] General Switch-off: Scene” will be enabled, which will send a scene run / save order (configurable in “Action” and “Scene Number”) whenever the general switch-off takes off
- **HVAC:** if checked, object “[ML] General Switch-off: HVAC mode” will be enabled, which will send an HVAC thermostat mode value (configurable in “Value”, being the options “Auto”, “Comfort”, “Standby”, “Economy” and “Building Protection”) whenever the general switch-off takes off

**Note:** *the above options are not mutually exclusive; it is possible to send values of different nature together.*

- **Courtesy Switch-On:**

The parameters available here are entirely analogous to those already mentioned for General Switch-Off. However, in this case the names of the objects start with “[ML] Courtesy Switch-On (...)”. On the other hand, sending **scene save orders** is not possible for the courtesy switch-on (only orders to play scenes are allowed).

**Note:** *object “[ML] Courtesy Switch-On: Binary Object” sends the value “1”*



(when the courtesy switch-on takes place), in contrast to object “[ML] **General Switch-Off: Binary Object**”, which sends the value “0” (during the general switch-off, as explained above).

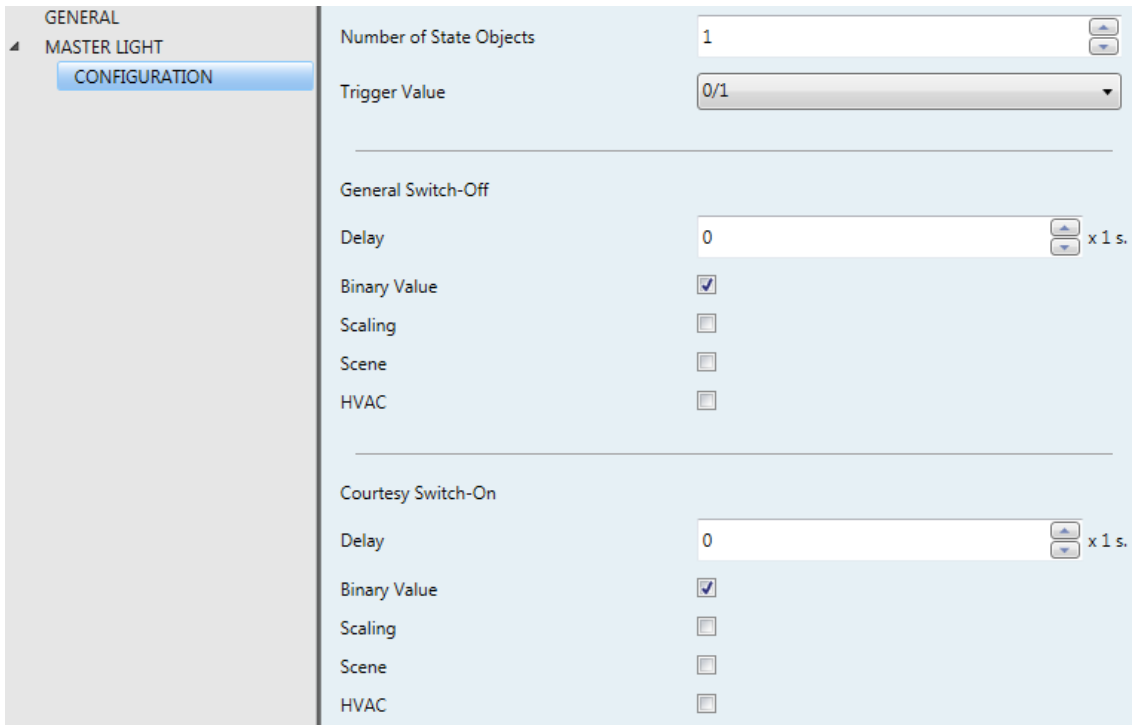


Figure 5. Sending of Indication objects on bus voltage recovery

## 2.7 SCENE TEMPORISATION

The scene temporisation allows imposing **delays over the scenes of the outputs**. These delays are defined in parameters, and can be applied to the execution of one or more scenes that may have been configured.

Please bear in mind that, as multiple delayed scenes can be configured for each individual output or shutter channel, in case of receiving an order to execute one of them when a previous temporisation is still pending for that output or that channel, such temporisation will be interrupted and only the delay and the action of the new scene will be executed.

### ETS PARAMETERISATION

Prior to setting the **scene temporisation**, it is necessary to have one or more scenes configured in some of the outputs. When entering the Configuration window under Scene Temporization, all configured scenes will be listed, together with a few checkboxes to select which of them need to be temporised, as shown in Figure 6.

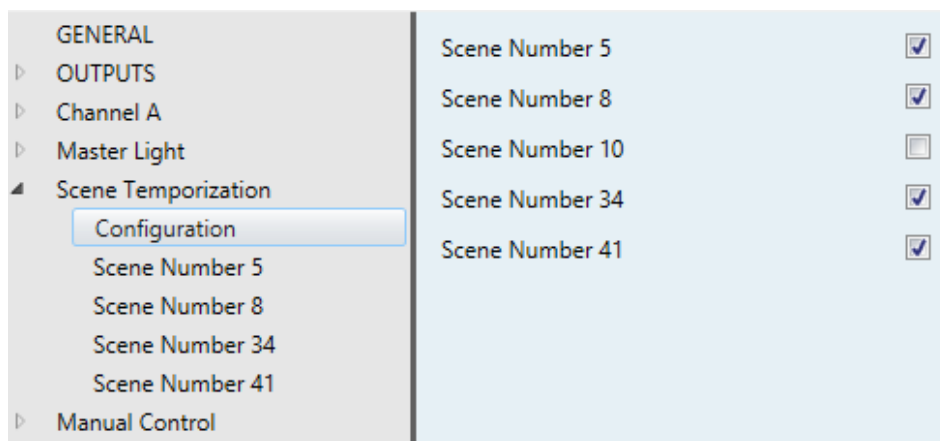


Figure 6. Scene temporisation

Enabling a certain scene number n brings a new tab with such name to the menu on the left, from which it is possible to configure the temporisation of that scene for each of the outputs where it has been configured.

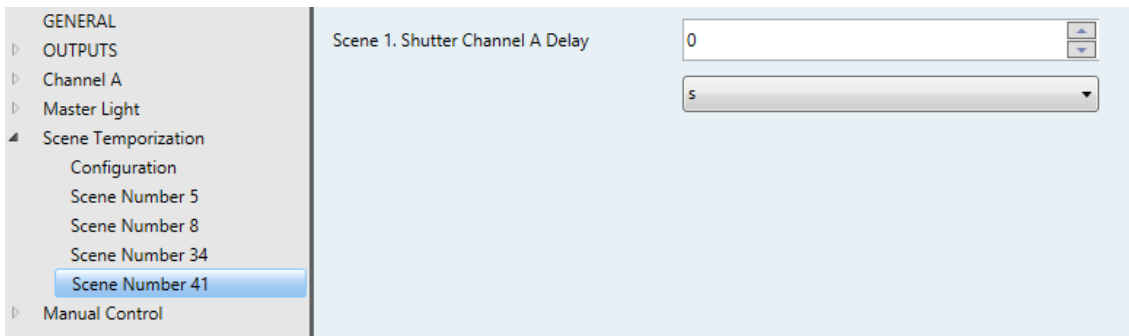


Figure 7. Configuration of the scene temporisation

Therefore, parameter “**Scene m. Z Delay**” defines the delay that will be applied to the action defined in Z for the execution of scene m (where Z may be a specific individual output, shutter channel or fan coil module). The range of this delay is 0 to 3600 seconds, 0 to 1440 minutes or 0 to 24 hours.

## ANNEX I. COMMUNICATION OBJECTS

- “**Functional range**” shows the values that, with independence of any other values permitted by the bus according to the object size, may be of any use or have a particular meaning because of the specifications or restrictions from both the KNX standard or the application program itself.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit		C T - - -	DPT_Trigger	0/1	Reset 0	Voltage Recovery -> Sending of 0
2	1 Bit		C T - - -	DPT_Trigger	0/1	Reset 1	Voltage Recovery -> Sending of 1
3	1 Bit	I	C - - W -	DPT_Switch	0/1	Lock Manual Control	0 = Lock; 1 = Unlock
	1 Bit	I	C - - W -	DPT_Switch	0/1	Lock Manual Control	0 = Unlock; 1 = Lock
4 - 35	1 Bit	I	C - - W -	DPT_Bool	0/1	[LF] (1 bit) Data Entry X	Binary Data Entry (0/1)
36 - 51	1 Byte	I	C - - W -	DPT_Value_1_Ucount	0 - 255	[LF] (1 byte) Data Entry X	1 byte Data Entry (0-255)
52 - 67	2 Byte	I	C - - W -	DPT_Value_2_Ucount	0 - 65535	[LF] (2 bytes) Data Entry X	2 bytes Data Entry
				DPT_Value_2_Count	-32768 - 32767		
				DPT_Value_Temp	-273,00 - 670760,00		
68 - 75	4 Byte	I	C - - W -	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] (4 bytes) Data Entry X	4 bytes Data Entry
76, 77, 78, 79, 80, 81, 82, 83, 84, 85	1 Bit	O	C T R - -	DPT_Bool	0/1	[LF] Function X - Result	(1 bit) Boolean
	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0 - 255	[LF] Function X - Result	(1 byte) Unsigned
	2 Byte	O	C T R - -	DPT_Value_2_Ucount	0 - 65535	[LF] Function X - Result	(2 bytes) Unsigned
	4 Byte	O	C T R - -	DPT_Value_4_Count	-2147483648 - 2147483647	[LF] Function X - Result	(4 bytes) Signed
86	1 Byte	I	C - - W -	DPT_SceneControl	0-63; 128-191	[Outputs] Scenes	0 – 63 (Execute 1 – 64); 128 – 191 (Save 1 – 64)
87, 95	1 Bit	I	C - - W -	DPT_BinaryValue	0/1	[OX] On/Off	N.O. (0=Open Relay; 1=Close Relay)
	1 Bit	I	C - - W -	DPT_BinaryValue	0/1	[OX] On/Off	N.C. (0=Close Relay; 1= Open Relay)
88, 96	1 Bit	O	C T R - -	DPT_BinaryValue	0/1	[OX] On/Off (Status)	0=Output Off; 1=Output On
89, 97	1 Bit	I	C - - W -	DPT_Enable	0/1	[OX] Lock	0=Unlock; 1=Lock
90, 98	1 Bit	I	C - - W -	DPT_Start	0/1	[OX] Timer	0=Switch Off; 1=Switch On
91, 99	1 Bit	I	C - - W -	DPT_Start	0/1	[OX] Flashing	0=Stop; 1=Start
92, 100	1 Bit	I	C - - W -	DPT_Alarm	0/1	[OX] Alarm	0=Normal; 1=Alarm
	1 Bit	I	C - - W -	DPT_Alarm	0/1	[OX] Alarm	0=Alarm; 1=Normal
93, 101	1 Bit	I	C - - W -	DPT_Trigger	0/1	[OX] Unfreeze Alarm	Alarm=0 + Unfreeze=1 => End Alarm

94, 102	1 Bit	O	C T R - -	DPT_Trigger	0/1	[OX] Warning Time (Status)	0=Normal; 1=Warning
103	1 Byte	I	C - - W -	DPT_SceneControl	0-63; 128-191	[Shutter] Scenes	0 - 63 (Execute 1 - 64); 128 - 191 (Save 1 - 64)
104	1 Bit	I	C - - W -	DPT_UpDown	0/1	[CX] Move	0=Raise; 1=Lower
105	1 Bit	I	C - - W -	DPT_Step	0/1	[CX] Stop/Step	0=Stop/StepUp; 1=Stop/StepDown
	1 Bit	I	C - - W -	DPT_Trigger	0/1	[CX] Stop	0=Stop; 1=Stop
106	1 Bit	I	C - - W -	DPT_Enable	0/1	[CX] Lock	0=Unlock; 1=Lock
107	1 Bit	O	C T R - -	DPT_Switch	0/1	[CX] Rising Relay (Status)	0=Opened; 1=Closed
108	1 Bit	O	C T R - -	DPT_Switch	0/1	[CX] Lowering Relay (Status)	0=Opened; 1=Closed
109	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[CX] Shutter Position (Status)	0%=Top; 100%=Bottom
110	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[CX] Slats Position (Status)	0%=Open; 100%=Closed
111	1 Byte	I	C - - W -	DPT_Scaling	0% - 100%	[CX] Shutter Positioning	0%=Top; 100%=Bottom
112	1 Byte	I	C - - W -	DPT_Scaling	0% - 100%	[CX] Slats Positioning	0%=Open; 100%=Closed
113	1 Bit	I	C - - W -	DPT_Alarm	0/1	[CX] Alarm	0=No Alarm; 1=Alarm
	1 Bit	I	C - - W -	DPT_Alarm	0/1	[CX] Alarm	0=Alarm; 1=No Alarm
114	1 Bit	I	C - - W -	DPT_Alarm	0/1	[CX] Alarm 2	0=No Alarm; 1=Alarm
	1 Bit	I	C - - W -	DPT_Alarm	0/1	[CX] Alarm 2	0=Alarm; 1=No Alarm
115	1 Bit	I	C - - W -	DPT_Trigger	0/1	[CX] Unfreeze Alarm	Alarm=0 + Unfreeze=1 => End Alarm
116	1 Bit	I	C - - W -	DPT_Scene_AB	0/1	[CX] Move (Reversed)	0=Lower; 1=Raise
117	1 Bit	I	C - - W -	DPT_Trigger	0/1	[CX] Direct Positioning	0=No Action; 1=Go to Position
118	1 Bit	I	C - - W -	DPT_Trigger	0/1	[CX] Direct Positioning 2	0=No Action; 1=Go to Position
119	1 Bit	I	C - - W -	DPT_Trigger	0/1	[CX] Direct Positioning (Save)	0=No Action; 1=Save Current Position
120	1 Bit	I	C - - W -	DPT_Trigger	0/1	[CX] Direct Positioning 2 (Save)	0=No Action; 1=Save Current Position
121	1 Byte	I	C - - W -	DPT_SceneControl	0-63; 128-191	[Thermostat] Scene Input	Scene Value
122, 152, 182, 212	2 Byte	I	C - - W -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Temperature Source 1	External Sensor Temperature
123, 153, 183, 213	2 Byte	I	C - - W -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Temperature Source 2	External Sensor Temperature
124, 154, 184, 214	2 Byte	O	C T R - -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Effective Temperature	Effective Control Temperature
125, 155, 185, 215	1 Byte	I	C - - W -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[TX] Special Mode	1-byte HVAC Mode
126, 156, 186, 216	1 Bit	I	C - - W -	DPT_Trigger	0/1	[TX] Special Mode: comfort	0 = Nothing; 1 = Trigger
	1 Bit	I	C - - W -	DPT_Switch	0/1	[TX] Special Mode: comfort	0 = Off; 1 = On
127, 157, 187, 217	1 Bit	I	C - - W -	DPT_Trigger	0/1	[TX] Special Mode: standby	0 = Nothing; 1 = Trigger
	1 Bit	I	C - - W -	DPT_Switch	0/1	[TX] Special Mode: standby	0 = Off; 1 = On

128, 158, 188, 218	1 Bit	I	C - - W -	DPT_Trigger	0/1	[TX] Special Mode: economy	0 = Nothing; 1 = Trigger
	1 Bit	I	C - - W -	DPT_Switch	0/1	[TX] Special Mode: economy	0 = Off; 1 = On
129, 159, 189, 219	1 Bit	I	C - - W -	DPT_Trigger	0/1	[TX] Special Mode: protection	0 = Nothing; 1 = Trigger
	1 Bit	I	C - - W -	DPT_Switch	0/1	[TX] Special Mode: protection	0 = Off; 1 = On
130, 160, 190, 220	1 Bit	I	C - - W -	DPT_Window_Door	0/1	[TX] Window Status (input)	0 = Closed; 1 = Open
131, 161, 191, 221	1 Bit	I	C - - W -	DPT_Trigger	0/1	[TX] Comfort Prolongation	0 = Nothing; 1 = Timed Comfort
132, 162, 192, 222	1 Byte	O	C T R - -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[TX] Special Mode Status	1-byte HVAC Mode
133, 163, 193, 223	2 Byte	I	C - - W -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Setpoint	Thermostat Setpoint Input
	2 Byte	I	C - - W -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Basic Setpoint	Reference Setpoint
134, 164, 194, 224	1 Bit	I	C - - W -	DPT_Step	0/1	[TX] Setpoint Step	0 = -0.5°C; 1 = +0.5°C
135, 165, 195, 225	2 Byte	I	C - - W -	DPT_Value_Tempd	-670760.00 - 670760.00	[TX] Setpoint Offset	Float Offset Value
136, 166, 196, 226	2 Byte	O	C T R - -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Setpoint Status	Current Setpoint
137, 167, 197, 227	2 Byte	O	C T R - -	DPT_Value_Temp	-273.00 - 670760.00	[TX] Basic Setpoint Status	Current Basic Setpoint
138, 168, 198, 228	2 Byte	O	C T R - -	DPT_Value_Tempd	-670760.00 - 670760.00	[TX] Setpoint Offset Status	Current Setpoint Offset
139, 169, 199, 229	1 Bit	I	C - - W -	DPT_Reset	0/1	[TX] Setpoint Reset	Reset Setpoint to Default
	1 Bit	I	C - - W -	DPT_Reset	0/1	[TX] Offset Reset	Reset offset
140, 170, 200, 230	1 Bit	I	C - - W -	DPT_Heat_Cool	0/1	[TX] Mode	0 = Cool; 1 = Heat
141, 171, 201, 231	1 Bit	O	C T R - -	DPT_Heat_Cool	0/1	[TX] Mode Status	0 = Cool; 1 = Heat
142, 172, 202, 232	1 Bit	I	C - - W -	DPT_Switch	0/1	[TX] On/Off	0 = Off; 1 = On
143, 173, 203, 233	1 Bit	O	C T R - -	DPT_Switch	0/1	[TX] On/Off Status	0 = Off; 1 = On
144, 174, 204, 234	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[TX] Control Variable (Cool)	PI Control (Continuous)
145, 175, 205, 235	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[TX] Control Variable (Heat)	PI Control (Continuous)
146, 176, 206, 236	1 Bit	O	C T R - -	DPT_Switch	0/1	[TX] Control Variable (Cool)	2-Point Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[TX] Control Variable (Cool)	PI Control (PWM)

147, 177, 207, 237	1 Bit	O	<b>CTR--</b>	DPT_Switch	0/1	[TX] Control Variable (Heat)	2-Point Control
	1 Bit	O	<b>CTR--</b>	DPT_Switch	0/1	[TX] Control Variable (Heat)	PI Control (PWM)
148, 178, 208, 238	1 Bit	O	<b>CTR--</b>	DPT_Switch	0/1	[TX] Additional Cool	Temp >= (Setpoint+Band) => "1"
149, 179, 209, 239	1 Bit	O	<b>CTR--</b>	DPT_Switch	0/1	[TX] Additional Heat	Temp <= (Setpoint-Band) => "1"
150, 180, 210, 240	1 Bit	O	<b>CTR--</b>	DPT_Switch	0/1	[TX] PI State (Cool)	0 = PI signal 0%; 1 = PI signal greater than 0%
151, 181, 201, 241	1 Bit	O	<b>CTR--</b>	DPT_Switch	0/1	[TX] PI State (Heat)	0 = PI signal 0%; 1 = PI signal greater than 0%
242	1 Bit	I	<b>C--W-</b>	DPT_Trigger	0/1	[ML] Trigger	Trigger the Master Light Function
243	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 1	Binary Status
244	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 2	Binary Status
245	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 3	Binary Status
246	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 4	Binary Status
247	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 5	Binary Status
248	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 6	Binary Status
249	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 7	Binary Status
250	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 8	Binary Status
251	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 9	Binary Status
252	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 10	Binary Status
253	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 11	Binary Status
254	1 Bit	I	<b>C--W-</b>	DPT_Switch	0/1	[ML] Status Object 12	Binary Status
255	1 Bit		<b>CT---</b>	DPT_Switch	0/1	[ML] General Switch-Off: Binary Object	Off Sending
256	1 Byte		<b>CT---</b>	DPT_Scaling	0% - 100%	[ML] General Switch-Off: Scaling	0-100%
257	1 Byte		<b>CT---</b>	DPT_SceneControl	0-63; 128-191	[ML] General Switch-Off: Scene	Scene Sending
258	1 Byte		<b>CT---</b>	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[ML] General Switch-Off: HVAC mode	Auto, Comfort, Standby, Economy, Building Protection
259	1 Bit		<b>CT---</b>	DPT_Switch	0/1	[ML] Courtesy Switch-On: Binary Object	On Sending
260	1 Byte		<b>CT---</b>	DPT_Scaling	0% - 100%	[ML] Courtesy Switch-On: Scaling	0-100%
261	1 Byte		<b>CT---</b>	DPT_SceneControl	0-63; 128-191	[ML] Courtesy Switch-On: Scene	Scene Sending
262	1 Byte		<b>CT---</b>	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[ML] Courtesy Switch-On: HVAC mode	Auto, Comfort, Standby, Economy, Building Protection
263, 267, 271, 275, 279	2 Byte	O	<b>CTR--</b>	DPT_Value_Temp	-273.00 - 670760.00	[IX] Current Temperature	Temperature sensor value

264, 268, 272, 276, 280	1 Bit	O	<b>C T R - -</b>	DPT_Alarm	0/1	[IX] Overcooling	0 = No Alarm; 1 = Alarm
265, 269, 273, 277, 281	1 Bit	O	<b>C T R - -</b>	DPT_Alarm	0/1	[IX] Overheating	0 = No Alarm; 1 = Alarm
266, 270, 274, 278, 282	1 Bit	O	<b>C T R - -</b>	DPT_Alarm	0/1	[IX] Probe Error	0 = No Alarm; 1 = Alarm
283, 289, 295, 301, 307	1 Bit	I	<b>C - - W -</b>	DPT_Switch	0/1	[IX] Input Lock	1 = Locked; 0 = Unlocked
284, 290, 296, 302, 308	1 Bit		<b>C T - - -</b>	DPT_Switch	0/1	[IX] [Short Press] 0	Sending of 0
	1 Bit		<b>C T - - -</b>	DPT_Switch	0/1	[IX] [Short Press] 1	Sending of 1
	1 Bit	I	<b>C T - W -</b>	DPT_Switch	0/1	[IX] [Short Press] 0/1 Switching	Switching 0/1
	1 Bit		<b>C T - - -</b>	DPT_UpDown	0/1	[IX] [Short Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		<b>C T - - -</b>	DPT_UpDown	0/1	[IX] [Short Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		<b>C T - - -</b>	DPT_UpDown	0/1	[IX] [Short Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		<b>C T - - -</b>	DPT_Step	0/1	[IX] [Short Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step up)
	1 Bit		<b>C T - - -</b>	DPT_Step	0/1	[IX] [Short Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step down)
	1 Bit		<b>C T - - -</b>	DPT_Step	0/1	[IX] [Short Press] Stop/Step Shutter (switched)	Switching of 0/1 (Stop/Step up/down)
	4 Bit		<b>C T - - -</b>	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x2 (Dec. by 50%) 0x3 (Dec. by 25%) 0x4 (Dec. by 12%) 0x5 (Dec. by 6%) 0x6 (Dec. by 3%) 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) 0xA (Inc. by 50%) 0xB (Inc. by 25%) 0xC (Inc. by 12%) 0xD (Inc. by 6%) 0xE (Inc. by 3%) 0xF (Inc. by 1%)	[IX] [Short Press] Brighter	Increase Brightness
	4 Bit		<b>C T - - -</b>	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x2 (Dec. by 50%) ... 0x8 (Stop) 0x9 (Inc. by 100%) ...	[IX] [Short Press] Darker	Decrease Brightness



				0xF (Inc. by 1%)			
	4 Bit		<b>CT---</b>	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x2 (Dec. by 50%) ... 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[IX] [Short Press] Brighter/Darker	Switch Bright/Dark
	1 Bit		<b>CT---</b>	DPT_Switch	0/1	[IX] [Short Press] Dimmer ON	Sending of 1 (ON)
	1 Bit		<b>CT---</b>	DPT_Switch	0/1	[IX] [Short Press] Dimmer OFF	Sending of 0 (OFF)
	1 Bit	I	<b>CT-W-</b>	DPT_Switch	0/1	[IX] [Short Press] Dimmer ON/OFF	Switching 0/1
	1 Byte		<b>CT---</b>	DPT_SceneControl	0-63; 128-191	[IX] [Short Press] Run Scene	Sending of 0 - 63
	1 Byte		<b>CT---</b>	DPT_SceneControl	0-63; 128-191	[IX] [Short Press] Save Scene	Sending of 128 - 191
	1 Bit	I/O	<b>CTRW-</b>	DPT_Switch	0/1	[IX] [Switch/Sensor] Edge	Sending of 0 or 1
	1 Byte		<b>CT---</b>	DPT_Value_1_Ucount	0 - 255	[IX] [Short Press] Constant Value (Integer)	0 - 255
	1 Byte		<b>CT---</b>	DPT_Scaling	0% - 100%	[IX] [Short Press] Constant Value (Percentage)	0% - 100%
285, 291, 297, 303, 309	2 Byte		<b>CT---</b>	DPT_Value_2_Ucount	0 - 65535	[IX] [Short Press] Constant Value (Integer)	0 - 65535
	2 Byte		<b>CT---</b>	9.xxx	-671088.64 - 670760.96	[IX] [Short Press] Constant Value (float)	Float value
285, 291, 297, 303, 309	1 Byte	I	<b>C--W-</b>	DPT_Scaling	0% - 100%	[IX] [Short Press] Shutter Status (input)	0% = Top; 100% = Bottom
	1 Byte	I	<b>C--W-</b>	DPT_Scaling	0% - 100%	[IX] [Short Press] Dimming Status (input)	0% - 100%
286, 292, 298, 304, 310	1 Bit		<b>CT---</b>	DPT_Switch	0/1	[IX] [Long Press] 0	Sending of 0
	1 Bit		<b>CT---</b>	DPT_Switch	0/1	[IX] [Long Press] 1	Sending of 1
	1 Bit	I	<b>CT-W-</b>	DPT_Switch	0/1	[IX] [Long Press] 0/1 Switching	Switching 0/1
	1 Bit		<b>CT---</b>	DPT_UpDown	0/1	[IX] [Long Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		<b>CT---</b>	DPT_UpDown	0/1	[IX] [Long Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		<b>CT---</b>	DPT_UpDown	0/1	[IX] [Long Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		<b>CT---</b>	DPT_Step	0/1	[IX] [Long Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step up)
	1 Bit		<b>CT---</b>	DPT_Step	0/1	[IX] [Long Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step down)
	1 Bit		<b>CT---</b>	DPT_Step	0/1	[IX] [Long Press] Stop/Step Shutter (switched)	Switching of 0/1 (Stop/Step up/down)
	4 Bit		<b>CT---</b>	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x2 (Dec. by 50%)	[IX] [Long Press] Brighter	Long Pr. -> Brighter; Release -> Stop

				... 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)		
	4 Bit		DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x2 (Dec. by 50%) ... 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[IX] [Long Press] Darker	Long Pr. -> Darker; Release -> Stop
	4 Bit		DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) 0x2 (Dec. by 50%) ... 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[IX] [Long Press] Brighter/Darker	Long Pr. -> Brighter/Darker; Release -> Stop
	1 Bit		DPT_Switch	0/1	[IX] [Long Press] Dimmer ON	Sending of 1 (ON)
	1 Bit		DPT_Switch	0/1	[IX] [Long Press] Dimmer OFF	Sending of 0 (OFF)
	1 Bit	I	DPT_Switch	0/1	[IX] [Long Press] Dimmer ON/OFF	Switching 0/1
	1 Byte		DPT_SceneControl	0-63; 128-191	[IX] [Long Press] Run Scene	Sending of 0 - 63
	1 Byte		DPT_SceneControl	0-63; 128-191	[IX] [Long Press] Save Scene	Sending of 128 - 191
	1 Bit	O	DPT_Alarm	0/1	[IX] [Switch/Sensor] Alarm: Breakdown or sabotage	1 = Alarm; 0 = No Alarm
	2 Byte		9.xxx	-671088.64 - 670760.96	[IX] [Long Press] Constant Value (float)	Float value
	2 Byte		DPT_Value_2_Ucount	0 - 65535	[IX] [Long Press] Constant Value (Integer)	0 - 65535
	1 Byte		DPT_Scaling	0% - 100%	[IX] [Long Press] Constant Value (Percentage)	0% - 100%
	1 Byte		DPT_Value_1_Ucount	0 - 255	[IX] [Long Press] Constant Value (Integer)	0 - 255
287, 293, 299, 305, 311	1 Bit		DPT_Trigger	0/1	[IX] [Long Press/Release] Stop Shutter	Release -> Stop Shutter
288, 294, 300, 306, 312	1 Byte	I	DPT_Scaling	0% - 100%	[IX] [Long Press] Dimming Status (input)	0% - 100%
	1 Byte	I	DPT_Scaling	0% - 100%	[IX] [Long Press] Shutter Status (input)	0% = Top; 100% = Bottom
	2 Byte		DPT_Value_2_Ucount	0 - 65535	[I5] [Short Press] Constant Value (Integer)	0 - 65535

	2 Byte		CT---	9.xxx	-671088.64 - 670760.96	[I5] [Short Press] Constant Value (float)	Float value
313	1 Byte	I	C--W-	DPT_SceneControl	0-63; 128-191	[Motion Detector] Scene Input	Scene Value
314	1 Byte		CT---	DPT_SceneControl	0-63; 128-191	[Motion Detector] Scene Output	Scene Value
315, 344, 373, 402, 431	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[IX] Luminosity	0-100%
316, 345, 374, 403, 432	1 Bit	O	CTR--	DPT_Alarm	0/1	[IX] Open Circuit Error	0 = No Error; 1 = Open Circuit Error
317, 346, 375, 404, 433	1 Bit	O	CTR--	DPT_Alarm	0/1	[IX] Short Circuit Error	0 = No Error; 1 = Short Circuit Error
318, 347, 376, 405, 434	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[IX] Presence State (Scaling)	0-100%
319, 348, 377, 406, 435	1 Byte	O	CTR--	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[IX] Presence State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
320, 349, 378, 407, 436	1 Bit	O	CTR--	DPT_Occupancy	0/1	[IX] Presence State (Binary)	Binary Value
	1 Bit	O	CTR--	DPT_Trigger	0/1	[IX] Presence: Slave Output	1 = Motion Detected
321, 350, 379, 408, 437	1 Bit	I	C--W-	DPT_Window_Door	0/1	[IX] Presence Trigger	Binary Value to Trigger the Presence Detection
322, 351, 380, 409, 438	1 Bit	I	C--W-	DPT_Trigger	0/1	[IX] Presence: Slave Input	0 = Nothing; 1 = Detection from slave device
323, 352, 381, 410, 439	2 Byte	I	C--W-	DPT_TimePeriodSec	0 - 65535	[IX] Presence: Waiting Time	0-65535 s.
324, 353, 382, 411, 440	2 Byte	I	C--W-	DPT_TimePeriodSec	0 - 65535	[IX] Presence: Listening Time	1-65535 s.
325, 354, 383, 412, 441	1 Bit	I	C--W-	DPT_Switch	0/1	[IX] Presence: Enable	According to parameters
326, 355, 384, 413, 442	1 Bit	I	C--W-	DPT_Switch	0/1	[IX] Presence: Day/Night	According to parameters
327, 356, 385, 414, 443	1 Bit	O	CTR--	DPT_Occupancy	0/1	[IX] Presence: Occupancy State	0 = Not Occupied; 1 = Occupied
328, 357, 386, 415, 444	1 Bit	I	C--W-	DPT_Trigger	0/1	[IX] External Motion Detection	0 = Nothing; 1 = Motion detected by an external sensor
329, 358, 387, 416, 445	1 Byte	O	CTR--	DPT_Scaling	0% - 100%	[IX] [C1] Detection State (Scaling)	0-100%
330, 359, 388, 417, 446	1 Byte	O	CTR--	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[IX] [C1] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
331, 360, 389,	1 Bit	O	CTR--	DPT_Switch	0/1	[IX] [C1] Detection State (Binary)	Binary Value

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332, 361, 390, 419, 448	1 Bit	I	C - - W -	DPT_Switch	0/1	[IX] [C1] Enable Channel	According to parameters
333, 362, 391, 420, 449	1 Bit	I	C - - W -	DPT_Switch	0/1	[IX] [C1] Force State	0 = No Detection; 1 = Detection
334, 363, 392, 421, 450	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[IX] [C2] Detection State (Scaling)	0-100%
335, 364, 393, 422, 451	1 Byte	O	C T R - -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[IX] [C2] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
335, 364, 393, 422, 452	1 Bit	O	C T R - -	DPT_Switch	0/1	[IX] [C2] Detection State (Binary)	Binary Value
337, 366, 395, 424, 453	1 Bit	I	C - - W -	DPT_Switch	0/1	[IX] [C2] Enable Channel	According to parameters
338, 367, 396, 425, 454	1 Bit	I	C - - W -	DPT_Switch	0/1	[IX] [C2] Force State	0 = No Detection; 1 = Detection
339, 368, 397, 426, 455	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[IX] [C3] Detection State (Scaling)	0-100%
340, 369, 398, 427, 456	1 Byte	O	C T R - -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[IX] [C3] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
341, 370, 399, 428, 457	1 Bit	O	C T R - -	DPT_Switch	0/1	[IX] [C3] Detection State (Binary)	Binary Value
342, 371, 400, 429, 458	1 Bit	I	C - - W -	DPT_Switch	0/1	[IX] [C3] Enable Channel	According to parameters
343, 372, 401, 430, 459	1 Bit	I	C - - W -	DPT_Switch	0/1	[IX] [C3] Force State	0 = No Detection; 1 = Detection

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